DOCUMENTS IN SUPPORT OF WATER BOARDS' COMMENTS ON

PROPOSED REASONABLE REIMBURSEMENT METHODOLOGIES DOCUMENTS

07-TC-09

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
ORDER NO. R9-2007-0001
NPDES NO. CAS0108758
WASTE DISCHARGE REQUIREMENTS
FOR DISCHARGES OF URBAN RUNOFF FROM
THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)
DRAINING THE WATERSHEDS OF THE COUNTY OF SAN DIEGO,
THE INCORPORATED CITIES OF SAN DIEGO COUNTY,
THE SAN DIEGO UNIFIED PORT DISTRICT,
AND THE SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

A. BASIS FOR THE ORDER

1. This Order is based on the federal Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable state and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (SWRCB), the Water Quality Control Plan for the San Diego Basin adopted by the Regional Board, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

2. This Order renews National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108758, which was first issued on July 16, 1990 (Order No. 90-42), and then renewed on February 21, 2001 (Order No. 2001-01). On August 25, 2005, in accordance with Order No. 2001-01, the County of San Diego, as the Principal Permittee, submitted a Report of Waste Discharge (ROWD) for renewal of their MS4 Permit.

B. REGULATED PARTIES

1. Each of the persons in Table 1 below, hereinafter called Copermittees or dischargers, owns or operates a municipal separate storm sewer system (MS4), through which it discharges urban runoff into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Table 1. Municipal Copermittees

1.	City of Carlsbad	12.	City of Oceanside
2.	City of Chula Vista	13.	City of Poway
3.	City of Coronado	14.	City of San Diego
4.	City of Del Mar	15.	City of San Marcos
5.	City of El Cajon	16.	City of Santee
6.	City of Encinitas	17.	City of Solana Beach
7.	City of Escondido	18.	City of Vista
8.	City of Imperial Beach	19.	County of San Diego
9.	City of La Mesa	20.	San Diego Unified Port District
10.	City of Lemon Grove	21.	San Diego County Regional Airport Authority
11.	City of National City		

C. DISCHARGE CHARACTERISTICS

1. Urban runoff contains waste, as defined in the California Water Code (CWC), and pollutants that adversely affect the quality of the waters of the State. The discharge of urban runoff from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA.

2. The most common categories of pollutants in urban runoff include total suspended solids, sediment (due to anthropogenic activities); pathogens (e.g., bacteria, viruses, protozoa);

heavy metals (e.g., copper, lead, zinc and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.

3. The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance.

4. Pollutants in urban runoff can threaten human health. Human illnesses have been clearly linked to recreating near storm drains flowing to coastal waters. Also, urban runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

5. Urban runoff discharges from MS4s often contain pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters.

6. The Copermittees discharge urban runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within ten of the eleven hydrologic units (watersheds) comprising the San Diego Region as shown in Table 2 below. Some of the receiving water bodies have been designated as impaired by the Regional Board and the United States Environmental Protection Agency (USEPA) in 2002 pursuant to CWA section 303(d). Also shown below are the watershed management areas (WMAs) as defined in the Regional Board report, Watershed Management Approach, January 2002.

Table 2. Common Watersheds and CWA Section 303(d) Impaired Waters

REGIONAL BOARD WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT[1]	COPERMITTEES
Santa Margarita River	Santa Margarita (902.00)	Santa Margarita River and Estuary, Pacific Ocean	1. Eutrophic 2. Nitrogen 3. Phosphorus 4. Total Dissolved Solids	1. County of San Diego
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River and Estuary, Pacific Ocean	1. Bacterial Indicators 2. Eutrophic 3. Chloride 4. Total Dissolved Solids	1. City of Escondido 2. City of Oceanside 3. City of Vista 4. County of San Diego
Carlsbad	Carlsbad (904.00)	Batiquitos Lagoon San Elijo Lagoon Agua Hedionda Lagoon Buena Vista Lagoon And Tributary Streams Pacific Ocean	1. Bacterial Indicators 2. Eutrophic 3. Sedimentation/Siltation 4. Nutrients 5. Total Dissolved Solids	1. City of Carlsbad 2. City of Encinitas 3. City of Escondido 4. City of Oceanside 5. City of San Marcos 6. City of Solana Beach 7. City of Vista 8. County of San Diego

[1] The listed 303(d) pollutant(s) of concern do not necessarily reflect impairment of the entire corresponding WMA or all corresponding major surface water bodies. The specific impaired portions of each WMA are listed in the State Water Resources Control Board's 2002 Section 303(d) List of Water Quality Limited Segments.

REGIONAL BOARD WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT[1]	COPERMITTEES
San Dieguito River	San Dieguito (905.00)	San Dieguito River and Estuary, Pacific Ocean	1. Bacterial Indicators 2. Sulfate 3. Color 4. Nitrogen 5. Phosphorus 6. Total Dissolved Solids	1. City of Del Mar 2. City of Escondido 3. City of Poway 4. City of San Diego 5. City of Solana Beach 6. County of San Diego
Mission Bay	Peñasquitos (906.00)	Los Peñasquitos Lagoon Mission Bay, Pacific Ocean	1. Bacterial Indicators 2. Metals 3. Eutrophic 4. Sedimentation/Siltation 5. Toxicity	1. City of Del Mar 2. City of Poway 3. City of San Diego 4. County of San Diego
San Diego River	San Diego (907.00)	San Diego River, Pacific Ocean	1. Bacterial Indicators 2. Eutrophic 3. pH 4. Total Dissolved Solids 5. Oxygen (Dissolved)	1. City of El Cajon 2. City of La Mesa 3. City of Poway 4. City of San Diego 5. City of Santee 6. County of San Diego
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay Sweetwater River Otay River Pacific Ocean	1. Bacterial Indicators 2. Metals 3. Sediment Toxicity 4. Benthic Community Degradation 5. Diazinon 6. Chlordane 7. Lindane 8. PAHs 9. PCBs	1. City of Chula Vista 2. City of Coronado 3. City of Imperial Beach 4. City of La Mesa 5. City of Lemon Grove 6. City of National City 7. City of San Diego 8. County of San Diego 9. San Diego Unified Port District 10.San Diego County Regional Airport Authority
Tijuana River	Tijuana (911.00)	Tijuana River and Estuary Pacific Ocean	1. Bacterial Indicators 2. Low Dissolved Oxygen 3. Metals 4. Eutrophic 5. Pesticides 6. Synthetic Organics 7. Trace Elements 8. Trash 9. Solids	1. City of Imperial Beach 2. City of San Diego 3. County of San Diego

7. The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for various urban runoff-related pollutants (diazinon, fecal coliform bacteria, total suspended solids, turbidity, metals, etc.) at various watershed monitoring stations. At some monitoring stations, such as Agua Hedionda, statistically significant upward trends in pollutant concentrations have been observed. Persistent toxicity has also been observed at some watershed monitoring stations. In addition, bioassessment data indicates that the majority of watersheds have Poor to Very Poor Index of Biotic Integrity ratings. In sum, the above findings indicate that urban runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in San Diego County.

8. When natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed urban area is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. Runoff durations can also increase as a result of flood control and other efforts to control peak flow rates. Increased volume, velocity, rate, and duration of runoff greatly accelerate the erosion of downstream natural channels. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur

with as little as a 10% conversion from natural to impervious surfaces. The increased runoff characteristics from new development must be controlled to protect against increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

9. Urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed urban area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality.

10. Development and urbanization especially threaten environmentally sensitive areas (ESAs), such as water bodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species) and CWA 303(d) impaired water bodies. Such areas have a much lower capacity to withstand pollutant shocks than might be acceptable in the general circumstance. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particular sensitive environment. Therefore, additional control to reduce pollutants from new and existing development may be necessary for areas adjacent to or discharging directly to an ESA.

11. Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; (3) protecting footings and foundations; and (4) ensuring that each drainage feature is adequately maintained in perpetuity.

D. URBAN RUNOFF MANAGEMENT PROGRAMS

1. General

a. This Order specifies requirements necessary for the Copermittees to reduce the discharge of pollutants in urban runoff to the maximum extent practicable (MEP). However, since MEP is a dynamic performance standard which evolves over time as urban runoff management knowledge increases, the Copermittees' urban runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of urban runoff management program implementation is expected to ultimately achieve compliance with water quality standards.

b. Although the Copermittees have generally been implementing the jurisdictional urban runoff management programs required pursuant to Order No. 2001-01 since February 21, 2002, urban runoff discharges continue to cause or contribute to violations of water quality standards. This Order contains new or modified requirements that are necessary to improve Copermittees' efforts to reduce the discharge of pollutants in urban runoff to the MEP and achieve water quality

standards. Some of the new or modified requirements, such as the expanded Watershed Urban Runoff Management Program section, are designed to specifically address these high priority water quality problems. Other new or modified requirements address program deficiencies that have been noted during audits, report reviews, and other Regional Board compliance assessment activities.

c. Updated Jurisdictional Urban Runoff Management Plans (JURMPs) and Watershed Urban Runoff Management Plans (WURMPs), and a new Regional Urban Runoff Management Plan (RURMP), which describe the Copermittees' urban runoff management programs in their entirety, are needed to guide the Copermittees' urban runoff management efforts and aid the Copermittees in tracking urban runoff management program implementation. It is practicable for the Copermittees to update the JURMPs and WURMPs, and create the RURMP, within one year, since significant efforts to develop these programs have already occurred.

d. Pollutants can be effectively reduced in urban runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control BMPs remove pollutants from urban runoff.

e. Urban runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of pollutants to the MEP and protect receiving waters. Development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in urban runoff to receiving waters.

f. Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Copermittees' programs.

2. Development Planning

a. The Standard Urban Storm Water Mitigation Plan (SUSMP) requirements contained in this Order are consistent with Order WQ-2000-11 adopted by the SWRCB on October 5, 2000. In the precedential order, the SWRCB found that the design standards, which essentially require that urban runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. The order also found that the SUSMP requirements are appropriately applied to the majority of the Priority Development Project categories contained in Section D.1 of this Order. The SWRCB also gave Regional Water Quality Control Boards the discretion to include additional categories and locations, such as retail gasoline outlets (RGOs), in future SUSMPs.

b. Controlling urban runoff pollution by using a combination of onsite source control and Low Impact Development (LID) BMPs augmented with treatment control BMPs before the runoff enters the MS4 is important for the following reasons: (1) Many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events. Whereas, onsite source control BMPs can be applied during all runoff conditions; (2) End-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; (3) End-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; (4) End-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the source and the BMP; and (5) Offsite end-of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

c. Use of LID BMPs at new development projects can be an effective means for minimizing the impact of urban runoff discharges from the development projects on receiving waters. LID BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of urban runoff.

d. Retail Gasoline Outlets (RGOs) are significant sources of pollutants in urban runoff. RGOs are points of convergence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up and consequently produce significantly higher loadings of hydrocarbons and trace metals (including copper and zinc) than other urban areas. To meet MEP, LID, source control, and treatment control BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more, or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. These are appropriate thresholds since vehicular development size and volume of traffic are good indicators of potential impacts of urban runoff from RGOs on receiving waters.

e. Sites of heavy industry are significant sources of pollutants in urban runoff. Pollutant concentrations and loads in runoff from industrial sites are similar or exceed pollutant concentrations and loads in runoff from other land uses, such as commercial or residential land uses. As with other land uses, LID, source control, and treatment control BMPs are needed at sites of heavy industry in order to meet the MEP standard. These BMPs are necessary where the site of heavy industry is larger than one acre. The one acre threshold is appropriate, since it is consistent with requirements in the Phase II NPDES storm water regulations.

f. If not properly designed or maintained, certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design and maintenance can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of urban runoff management programs.

3. Construction and Existing Development

a. In accordance with federal NPDES regulations and to ensure the most effective oversight of industrial and construction site discharges, discharges of runoff from

industrial and construction sites are subject to dual (state and local) storm water regulation. Under this dual system, the Regional Board is responsible for enforcing the General Construction Activities Storm Water Permit, SWRCB Order 99-08 DWQ, NPDES No. CAS000002 (General Construction Permit) and the General Industrial Activities Storm Water Permit, SWRCB Order 97-03 DWQ, NPDES No. CAS000001 (General Industrial Permit), and each municipal Copermittee is responsible for enforcing its local permits, plans, and ordinances, which may require the implementation of additional BMPs than required under the statewide general permits.

b. Identification of sources of pollutants in urban runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Copermittees to ensure that discharges of pollutants into and from its MS4 are reduced to the MEP. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at high risk areas for pollutant discharges.

c. Historic and current development makes use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially modified features. In these cases, the urban stream is both an MS4 and a receiving water.

d. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

e. Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed or treated. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges into MS4s must be reduced to the MEP unless treatment within the MS4 occurs.

f. Enforcement of local urban runoff related ordinances, permits, and plans is an essential component of every urban runoff management program and is specifically required in the federal storm water regulations and this Order. Each Copermittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water runoff, and for the allocation of funds for the capital, operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction.

g. Education is an important aspect of every effective urban runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water

quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions impact receiving water quality and how these impacts can be minimized.

h. Public participation during the development of urban runoff management programs is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

4. Watershed and Regional Urban Runoff Management

a. Since urban runoff does not recognize political boundaries, watershed-based urban runoff management can greatly enhance the protection of receiving waters within a watershed. Such management provides a means to focus on the most important water quality problems in each watershed. By focusing on the most important water quality problems, watershed efforts can maximize protection of beneficial use in an efficient manner. Effective watershed-based urban runoff management actively reduces pollutant discharges and abates pollutant sources causing or contributing to watershed water quality problems; watershed-based urban runoff management that does not actively reduce pollutant discharges and abate pollutant sources causing or contributing to watershed water quality problems can necessitate implementation of the iterative process outlined in section A.3 of the Order. Watershed management of urban runoff does not require Copermittees to expend resources outside of their jurisdictions. Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy, which can then be implemented on a jurisdictional basis.

b. Some urban runoff issues, such as residential education, can be effectively addressed on a regional basis. Regional approaches to urban runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs.

c. Both regionally and on a watershed basis, it is important for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially Caltrans, the Department of Defense, and Native American Tribes, is also important. Establishment of a management structure, within which the Copermittees subject to this Order will fund and coordinate those aspects of their joint obligations, will help promote implementation of urban runoff management programs on a watershed and regional basis in a most cost effective manner.

E. STATUTE AND REGULATORY CONSIDERATIONS

1. The Receiving Water Limitations (RWL) language specified in this Order is consistent with language recommended by the USEPA and established in SWRCB Water Quality Order 99-05, adopted by the SWRCB on June 17, 1999. The RWL in this Order require compliance with water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Compliance with receiving water limits based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the

creation of conditions of pollution.

2. The Water Quality Control Plan for the San Diego Basin (Basin Plan), identifies the following beneficial uses for surface waters in San Diego County: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1) Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional beneficial uses are identified for coastal waters of San Diego County: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

3. This Order is in conformance with SWRCB Resolution No. 68-16 and the federal Antidegradation Policy described in 40 CFR 131.12.

4. Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This NPDES permit addresses the management measures required for the urban category, with the exception of septic systems. The adoption and implementation of this NPDES permit relieves the Permittee from developing a non-point source plan, for the urban category, under CZARA. The Regional Board addresses septic systems through the administration of other programs.

5. Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of impaired waterbodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired waterbodies is called the Section 303(d) List. The current Section 303(d) List was approved by the SWRCB on February 4, 2003 and on July 25, 2003 by USEPA.

6. This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on August 14, 2002 for diazinon in Chollas Creek by establishing Water Quality Based Effluent Limits (WQBELs) for the Cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, and the San Diego Unified Port District; and by requiring: 1) legal authority, 2) implementation of a diazinon toxicity control plan and a diazinon public outreach/ education program, 3) achievement of the Compliance Schedule, and 4) a monitoring program. The establishment of WQBELs expressed as iterative BMPs to achieve the Waste Load Allocation (WLA) compliance schedule is appropriate and is expected to be sufficient to achieve the WLAs specified in the TMDL.

7. This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on February 9, 2005 for dissolved copper in Shelter Island Yacht Basin (SIYB) by establishing WQBELs expressed as BMPs to achieve the WLA of 30 kg copper / year for the City of San Diego and the San Diego Unified Port District. The establishment of WQBELs expressed as BMPs is appropriate and is expected to be sufficient to achieve the WLA

specified in the TMDL.

8. This Order establishes WQBELs and conditions consistent with the requirements and assumptions of the WLAs in the TMDLs as required by 40 CFR 122.44(d)(1)(vii)(B).

9. Requirements in this Order that are more explicit than the federal storm water regulations in 40 CFR 122.26 are prescribed in accordance with the CWA section 402(p)(3)(B)(iii) and are necessary to meet the MEP standard.

10. Urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of an urban runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This is consistent with USEPA guidance to avoid locating structural controls in natural wetlands.

11. The issuance of waste discharge requirements and an NPDES permit for the discharge of urban runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

F. PUBLIC PROCESS

1. The Regional Board has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an Order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of urban runoff.

2. The Regional Board has, at public meetings on (date), held public hearings and heard and considered all comments pertaining to the terms and conditions of this Order.

IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder, and the provisions of the Clean Water Act (CWA) and regulations adopted thereunder, shall each comply with the following:

A. PROHIBITIONS AND RECEIVING WATER LIMITATIONS

1. Discharges into and from municipal separate storm sewer systems (MS4s) in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state are prohibited.

2. Discharges from MS4s containing pollutants which have not been reduced to the maximum extent practicable (MEP) are prohibited.[2]

[2] This prohibition does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer).

3. Discharges 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.

   a. Each Copermittee shall comply with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order through timely implementation of control measures and other actions to reduce pollutants in urban runoff discharges in accordance with the Jurisdictional Urban Runoff Management Program and other requirements of this Order including any modifications. The Jurisdictional Urban Runoff Management Program shall be designed to achieve compliance with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order. If exceedance(s) of water quality standards persist notwithstanding implementation of the Jurisdictional Urban Runoff Management Program and other requirements of this Order, the Copermittee shall assure compliance with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order by complying with the following procedure:

      (1) Upon a determination by either the Copermittee or the Regional Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the Regional Board that describes best management practices (BMPs) that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional Urban Runoff Management Program unless the Regional Board directs an earlier submittal. The report shall include an implementation schedule. The Regional Board may require modifications to the report;

      (2) Submit any modifications to the report required by the Regional Board within 30 days of notification;

      (3) Within 30 days following approval of the report described above by the Regional Board, the Copermittee shall revise its Jurisdictional Urban Runoff Management Program and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required;

      (4) Implement the revised Jurisdictional Urban Runoff Management Program and monitoring program in accordance with the approved schedule.

   b. So long as the Copermittee has complied with the procedures set forth above and is implementing the revised Jurisdictional Urban Runoff Management Program, the Copermittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Board to do so.

   c. Nothing in section A.3 shall prevent the Regional Board from enforcing any provision of this Order while the Copermittee prepares and implements the above report.

4. In addition to the above prohibitions, discharges from MS4s are subject to all Basin Plan prohibitions cited in Attachment A to this Order.

B. NON-STORM WATER DISCHARGES

1. Each Copermittee shall effectively prohibit all types of non-storm water discharges into its MS4 unless such discharges are either authorized by a separate National Pollutant Discharge Elimination System (NPDES) permit; or not prohibited in accordance with sections B.2 and B.3 below.

2. The following categories of non-storm water discharges are not prohibited unless a Copermittee or the Regional Board identifies the discharge category as a significant source of pollutants to waters of the U.S. For such a discharge category, the Copermittee shall either prohibit the discharge category or develop and implement appropriate control measures to reduce the discharge of pollutants to the MEP and report to the Regional Board pursuant to section J.

   a. Diverted stream flows;
   b. Rising ground waters;
   c. Uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to MS4s;
   d. Uncontaminated pumped ground water;
   e. Foundation drains;
   f. Springs;
   g. Water from crawl space pumps;
   h. Footing drains;
   i. Air conditioning condensation;
   j. Flows from riparian habitats and wetlands;
   k. Water line flushing;
   l. Landscape irrigation;
   m. Discharges from potable water sources not subject to NPDES Permit No. CAG679001, other than water main breaks;
   n. Irrigation water;
   o. Lawn watering;
   p. Individual residential car washing; and
   q. Dechlorinated swimming pool discharges.

3. Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited. As part of the Jurisdictional Urban Runoff Management Plan (JURMP), each Copermittee shall develop and implement a program to reduce pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) identified by the Copermittee to be significant sources of pollutants to waters of the United States.

4. Each Copermittee shall examine all dry weather field screening and analytical monitoring results collected in accordance with section D.4 of this Order and Receiving Waters Monitoring and Reporting Program No. R9-2007-0001 to identify water quality problems which may be the result of any non-prohibited discharge category(ies) identified above in section B.2. Follow-up investigations shall be conducted as necessary to identify and control any non-prohibited discharge category(ies) listed above.

C. LEGAL AUTHORITY

1. Each Copermittee shall establish, maintain, and enforce adequate legal authority to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

   a. Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites. This requirement applies both to industrial and construction sites which have coverage under the statewide general industrial or construction storm water permits, as well as to those sites which do not. Grading ordinances shall be upgraded and enforced as necessary to comply with this Order.

   b. Prohibit all identified illicit discharges not otherwise allowed pursuant to section B.2 including but not limited to:

      (1) Sewage;
      (2) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;
      (3) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;
      (4) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc.;
      (5) Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, commercial, and residential areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;
      (6) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;
      (7) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;
      (8) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and
      (9) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

   c. Prohibit and eliminate illicit connections to the MS4;

   d. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;

   e. Require compliance with conditions in Copermittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);

   f. Utilize enforcement mechanisms to require compliance with Copermittee storm water ordinances, permits, contracts, or orders;

   g. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees. Control of

the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as Caltrans, the Department of Defense, or Native American Tribes is encouraged;

h. Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits and with this Order, including the prohibition on illicit discharges to the MS4. This means the Copermittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities discharging into its MS4, including construction sites;

i. Require the use of BMPs to prevent or reduce the discharge of pollutants into MS4s to the MEP; and

j. Require documentation on the effectiveness of BMPs implemented to reduce the discharge of pollutants to the MS4 to the MEP.

2. Each Permittee shall include as part of its JURMP a statement certified by its chief legal counsel that the Copermittee has taken the necessary steps to obtain and maintain full legal authority to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order. This statement shall include:

a. Identification of all departments within the jurisdiction that conduct urban runoff related activities, and their roles and responsibilities under this Order. Include an up to date organizational chart specifying these departments and key personnel.

b. Citation of urban runoff related ordinances and the reasons they are enforceable;

c. Identification of the local administrative and legal procedures available to mandate compliance with urban runoff related ordinances and therefore with the conditions of this Order;

d. A description of how urban runoff related ordinances are implemented and appealed; and

e. Description of whether the municipality can issue administrative orders and injunctions or if it must go through the court system for enforcement actions.

D. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM

Each Copermittee shall implement all requirements of section D of this Order no later than 365 days after adoption of the Order, unless otherwise specified in this Order. Prior to 365 days after adoption of the Order, each Copermittee shall at a minimum implement its Jurisdictional URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01.

Each Copermittee shall develop and implement an updated Jurisdictional Urban Runoff Management Program for its jurisdiction. Each updated Jurisdictional Urban Runoff Management Program shall meet the requirements of section D of this Order, reduce the discharge of pollutants from the MS4 to the MEP, and prevent urban runoff discharges from the MS4 from causing or contributing to a violation of water quality standards.

1. Development Planning Component

Each Copermittee shall implement a program which meets the requirements of this section and (1) reduces Development Project discharges of pollutants from the MS4 to the MEP, (2) prevents Development Project discharges from the MS4 from causing or contributing to a violation of water quality standards, and (3) manages increases in runoff discharge rates and durations from Development Projects that are likely to cause increased erosion of stream beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

a. GENERAL PLAN

Each Copermittee shall revise as needed its General Plan or equivalent plan (e.g., Comprehensive, Master, or Community Plan) for the purpose of providing effective water quality and watershed protection principles and policies that direct land-use decisions and require implementation of consistent water quality protection measures for Development Projects.

b. ENVIRONMENTAL REVIEW PROCESS

Each Copermittee shall revise as needed their current environmental review processes to accurately evaluate water quality impacts and cumulative impacts and identify appropriate measures to avoid, minimize and mitigate those impacts for all Development Projects.

c. APPROVAL PROCESS CRITERIA AND REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

For all proposed Development Projects, each Copermittee during the planning process and prior to project approval and issuance of local permits shall prescribe the necessary requirements so that Development Project discharges of pollutants from the MS4 will be reduced to the MEP, will not cause or contribute to a violation of water quality standards, and will comply with Copermittee's ordinances, permits, plans, and requirements, and with this Order. The requirements shall include, but not be limited to, implementation by the project proponent of the following:

(1) Source control BMPs that reduce storm water pollutants of concern in urban runoff, including storm drain system stenciling and signage, properly designed outdoor material storage areas, properly designed trash storage areas, and implementation of efficient irrigation systems;
(2) LID BMPs where feasible which maximize infiltration, provide retention, slow runoff, minimize impervious footprint, direct runoff from impervious areas into landscaping, and construct impervious surfaces to minimum widths necessary;
(3) Buffer zones for natural water bodies, where feasible. Where buffer zones are infeasible, require project proponent to implement other buffers such as trees, access restrictions, etc., where feasible;
(4) Measures necessary so that grading or other construction activities meet the provisions specified in section D.2 of this Order; and
(5) Submittal of proof of a mechanism under which ongoing long-term maintenance of all structural post-construction BMPs will be conducted.

d. STANDARD URBAN STORM WATER MITIGATION PLANS (SUSMPS) – APPROVAL PROCESS CRITERIA AND REQUIREMENTS FOR PRIORITY DEVELOPMENT PROJECTS

Each Copermittee shall implement an updated local SUSMP which meets the requirements of section D.1.d of this Order and (1) reduces Priority Development Project discharges of pollutants from the MS4 to the MEP, (2) prevents Priority Development Project runoff discharges from the MS4 from causing or contributing to a violation of water quality standards, and (3) manages increases in runoff discharge rates and durations from Priority Development Projects that are likely to cause increased erosion of stream beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.[3]

(1) Definition of Priority Development Project

(a) Priority Development Projects are: a) all new Development Projects that fall under the project categories or locations listed in section D.1.d.(2), and b) those redevelopment projects that create, add or replace at least 5,000 square feet of impervious surfaces on an already developed site that falls under the project categories or locations listed in section D.1.d.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria discussed in section D.1.d.(6)(c) applies only to the addition, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to the entire development. Where a new Development Project feature, such as a parking lot, falls into a Priority Development Project Category, the entire project footprint is subject to SUSMP requirements.

(b) In addition to the Priority Development Project Categories identified in section D.1.d.(2), within three years of adoption of this Order Priority Development Projects shall also include all other pollutant generating Development Projects that result in the disturbance of one acre or more of land.[4] As an alternative to this one acre threshold, the Copermittees may collectively identify a different threshold, provided the Copermittees' threshold is at least as inclusive of Development Projects as the one acre threshold.

[3] Updated SUSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SUSMP or hydromodification requirement commences. If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project. Where feasible, the Copermittees shall utilize the SUSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SUSMP and hydromodification requirements in their plans.

[4] Pollutant generating Development Projects are those projects that generate pollutants at levels greater than background levels.

(2) Priority Development Project Categories

(a) Housing subdivisions of 10 or more dwelling units. This category includes single-family homes, multi-family homes, condominiums, and apartments.
(b) Commercial developments greater than one acre. This category is defined as any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than one acre. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
(c) Developments of heavy industry greater than one acre. This category includes, but is not limited to, manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
(d) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.
(e) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirement D.1.d.(6)(c) and hydromodification requirement D.1.g.
(f) All hillside development greater than 5,000 square feet. This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
(g) Environmentally Sensitive Areas (ESAs). All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
(h) Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
(i) Street, roads, highways, and freeways. This category includes any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
(j) Retail Gasoline Outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average

Daily Traffic (ADT) of 100 or more vehicles per day.

(3) Pollutants of Concern

As part of its local SUSMP, each Copermittee shall develop and implement a procedure for pollutants of concern to be identified for each Priority Development Project. The procedure shall address, at a minimum: (1) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d)); (2) Land use type of the Development Project and pollutants associated with that land use type; and (3) Pollutants expected to be present on site.

(4) Low Impact Development (LID) BMP Requirements

Each Copermittee shall require each Priority Development Project to implement LID BMPs which will collectively minimize directly connected impervious areas and promote infiltration at Priority Development Projects:

(a) The following LID site design BMPs shall be implemented at all Priority Development Projects as required below:

i. For Priority Development Projects with landscaped or other pervious areas, drain a portion of impervious areas (rooftops, parking lots, sidewalks, walkways, patios, etc) into pervious areas prior to discharge to the MS4. The amount of runoff from impervious areas that is to drain to pervious areas shall correspond with the total capacity of the project's pervious areas to infiltrate or treat runoff, taking into consideration the pervious areas' soil conditions, slope, and other pertinent factors.
ii. For Priority Development Projects with landscaped or other pervious areas, properly design and construct the pervious areas to effectively receive and infiltrate or treat runoff from impervious areas, taking into consideration the pervious areas' soil conditions, slope, and other pertinent factors.
iii. For Priority Development Projects with low traffic areas and appropriate soil conditions, construct a portion of walkways, trails, overflow parking lots, alleys, or other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.

(b) The following LID BMPs listed below shall be implemented at all Priority Development Projects where applicable and feasible.

i. Conserve natural areas, including existing trees, other vegetation, and soils.
ii. Construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.
iii. Minimize the impervious footprint of the project.
iv. Minimize soil compaction.
v. Minimize disturbances to natural drainages (e.g., natural swales, topographic depressions, etc.)

(5) Source Control BMP Requirements

Each Copermittee shall require each Priority Development Project to implement source control BMPs. The source control BMPs to be required shall:

(a) Minimize storm water pollutants of concern in urban runoff.
(b) Include storm drain system stenciling or signage.
(c) Include properly designed outdoor material storage areas.
(d) Include properly designed trash storage areas.
(e) Include efficient irrigation systems.
(f) Include water quality requirements applicable to individual priority project categories.

(6) Treatment Control BMP Requirements[5]

Each Copermittee shall require each Priority Development Project to implement treatment control BMPs which meet the following treatment control BMP requirements:

(a) Treatment control BMPs for all Priority Development Projects shall mitigate (infiltrate, filter, or treat) the required volume or flow of runoff (identified in section D.1.d.(6)(c)) from all developed portions of the project, including landscaped areas.

(b) All treatment control BMPs shall be located so as to infiltrate, filter, or treat the required runoff volume or flow prior to its discharge to any waters of the U.S. Multiple Priority Development Projects may use shared treatment control BMPs as long as construction of any shared treatment control BMP is completed prior to the use or occupation of any Priority Development Project from which the treatment control BMP will receive runoff.

(c) All treatment control BMPs for a single Priority Development Project shall collectively be sized to comply with the following numeric sizing criteria:

i. Volume-based treatment control BMPs shall be designed to mitigate (infiltrate, filter, or treat) the volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the County of San Diego's 85th Percentile Precipitation Isopluvial Map; or

ii. Flow-based treatment control BMPs shall be designed to mitigate (infiltrate, filter, or treat) either: a) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or b) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

[5] LID BMPs that are correctly designed to effectively infiltrate, filter, or treat runoff can be considered treatment control BMPs.

(d) All treatment control BMPs for Priority Development Projects shall, at a minimum:

i. Be ranked with a high or medium pollutant removal efficiency for the project's most significant pollutants of concern, as the pollutant removal efficiencies are identified in the Copermittees' Model SUSMP and the most current updates thereto. Treatment control BMPs with a low removal efficiency ranking shall only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.
ii. Be correctly sized and designed so as to remove pollutants to the MEP.
iii. Target removal of pollutants of concern from urban runoff.
iv. Be implemented close to pollutant sources (where shared BMPs are not proposed), and prior to discharging into waters of the U.S.
v. Not be constructed within a receiving water.
vi. Include proof of a mechanism, to be provided by the project proponent or Copermittee, under which ongoing long-term maintenance will be conducted.

(7) Update of SUSMP BMP Requirements

The Copermittees shall collectively review and update the BMP requirements that are listed in their local SUSMPs. At a minimum, the update shall include removal of obsolete or ineffective BMPs, addition of LID and source control BMP requirements that meet or exceed the requirements of sections D.1.d.(4) and D.1.d.(5), and addition of LID BMPs that can be used for treatment, such as bioretention cells, bioretention swales, etc. The update shall also add appropriate LID BMPs to any tables or discussions in the local SUSMPs addressing pollutant removal efficiencies of treatment control BMPs. In addition, the update shall include review, and revision where necessary, of treatment control BMP pollutant removal efficiencies.

(8) Update of SUSMPs to Incorporate LID and Other BMP Requirements

(a) In addition to the implementation of the BMP requirements of sections D.1.d.(4-7) within one year of adoption of this Order, the Copermittees shall also develop and submit an updated Model SUSMP that defines minimum LID and other BMP requirements to be incorporated into the Copermittees' local SUSMPs for application to Priority Development Projects. The purpose of the updated Model SUSMP shall be to establish minimum standards to maximize the use of LID practices and principles in local Copermittee programs as a means of reducing stormwater runoff. It shall meet the following minimum requirements:

i. Establishment of LID BMP requirements that meet or exceed the minimum requirements listed in section D.1.d.(4) above.
ii. Establishment of source control BMP requirements that meet or exceed the minimum requirements listed in section D.1.d.(5) above.
iii. Establishment of treatment control BMP requirements that meet or exceed the minimum requirements listed in section D.1.d.(6) above.

iv. Establishment of siting, design, and maintenance criteria for each LID and treatment control BMP listed in the Model SUSMP, so that implemented LID and treatment control BMPs are constructed correctly and are effective at pollutant removal and/or runoff control. LID techniques, such as soil amendments, shall be incorporated into the criteria for appropriate treatment control BMPs.

v. Establishment of criteria to aid in determining Priority Development Project conditions where implementation of each LID BMP listed in section D.1.d.(4)(b) is applicable and feasible.

vi. Establishment of a requirement for Priority Development Projects with low traffic areas and appropriate or amendable soil conditions to construct a portion of walkways, trails, overflow parking lots, alleys, or other low-traffic areas with permeable surfaces, such a pervious concrete, porous asphalt, unit pavers, and granular materials.

vii. Establishment of restrictions on infiltration of runoff from Priority Development Project categories or Priority Development Project areas that generate high levels of pollutants, if necessary.

(b) The updated Model SUSMP shall be submitted within 18 months of adoption of this Order. If, within 60 days of submittal of the updated Model SUSMP, the Copermittees have not received in writing from the Regional Board either (1) a finding of adequacy of the updated Model SUSMP or (2) a modified schedule for its review and revision, the updated Model SUSMP shall be deemed adequate, and the Copermittees shall implement its provisions in accordance with section D.1.d.(8)(c) below.

(c) Within 365 days of Regional Board acceptance of the updated Model SUSMP, each Copermittee shall update its local SUSMP to implement the requirements established pursuant to section D.1.d.(8)(a). In addition to the requirements of section D.1.d.(8)(a), each Copermittee's updated local SUSMP shall include the following:

i. A requirement that each Priority Development Project use the criteria established pursuant to section D.1.d.(8)(a)v to demonstrate applicability and feasibility, or lack thereof, of implementation of the LID BMPs listed in section D.1.d.(4)(b).

ii. A review process which verifies that all BMPs to be implemented will meet the designated siting, design, and maintenance criteria, and that each Priority Development Project is in compliance with all applicable SUSMP requirements.

(9) Implementation Process

As part of its local SUSMP, each Copermittee shall implement a process to verify compliance with SUSMP requirements. The process shall identify at what point in the planning process Priority Development Projects will be required to meet SUSMP requirements. The process shall also include identification of the roles and responsibilities of various municipal departments in implementing the SUSMP requirements, as well as any other measures necessary for the implementation of SUSMP requirements.

(10) Downstream Erosion

As part of its local SUSMP, each Copermittee shall develop and apply criteria 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. Upon adoption of the Hydromodification Management Plan (HMP) by the Regional Board (section D.1.g), individual Copermittee criteria for control of downstream erosion shall be superseded by criteria identified in the HMP.

(11) Waiver Provision

(a) A Copermittee may provide for a project to be waived from the requirement of meeting numeric sizing criteria (sections D.1.d.(6)(c) or D.1.d.(8)(a)iii) if infeasibility can be established. A waiver of infeasibility shall only be granted by a Copermittee when all available BMPs have been considered and rejected as infeasible. Copermittees shall notify the Regional Board within 5 days of each waiver issued and shall include the following information in the notification:

i. Name of the person granting each waiver;
ii. Name of developer receiving the waiver;
iii. Site location;
iv. Reason for waiver; and
v. Description of BMPs required.

(b) The Copermittees may collectively or individually develop a program to require project proponents who have received waivers to transfer the savings in cost, as determined by the Copermittee(s), to a storm water mitigation fund. This program may be implemented by all Copermittees that issue waivers. Funds may be used on projects to improve urban runoff quality within the watershed of the waived project. The waiver mitigation program should, at a minimum, identify:

i. The entity or entities that will manage the storm water mitigation fund (i.e., assume full responsibility for);
ii. The range and types of acceptable projects for which mitigation funds may be expended;
iii. The entity or entities that will assume full responsibility for each mitigation project including its successful completion; and
iv. How the dollar amount of fund contributions will be determined.

(12) Infiltration and Groundwater Protection

To protect groundwater quality, each Copermittee shall apply restrictions to the use of treatment control BMPs that are designed to primarily function as centralized infiltration devices (such as large infiltration trenches and infiltration basins). Such restrictions shall be designed so that the use of such infiltration treatment control BMPs shall not cause or contribute to an exceedance of groundwater quality objectives. At a minimum, each treatment control BMP designed to primarily function as a centralized infiltration device shall meet the restrictions below, unless it is demonstrated that a restriction is not necessary to

protect groundwater quality. The Copermittees may collectively or individually develop alternative restrictions on the use of treatment control BMPs which are designed to primarily function as centralized infiltration devices. Alternative restrictions developed by the Copermittees can partially or wholly replace the restrictions listed below. The restrictions are not intended to be applied to small infiltration systems dispersed throughout a development project.

(a) Urban runoff shall undergo pretreatment such as sedimentation or filtration prior to infiltration;
(b) All dry weather flows containing significant pollutant loads shall be diverted from infiltration devices;
(c) Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;
(d) Infiltration treatment control BMPs shall be adequately maintained so that they remove pollutants to the MEP;
(e) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark shall be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;
(f) The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses;
(g) Infiltration treatment control BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries[6]; and other high threat to water quality land uses and activities as designated by each Permittee; and
(h) Infiltration treatment control BMPs shall be located a minimum of 100 feet horizontally from any water supply wells.

e. TREATMENT CONTROL BMP MAINTENANCE TRACKING

(1) Each Copermittee shall develop and utilize a watershed-based database to track and inventory approved treatment control BMPs and treatment control BMP maintenance within its jurisdiction. At a minimum, the database shall include information on treatment control BMP type, location, watershed, date of construction, party responsible for maintenance, maintenance certifications or verifications, inspections, inspection findings, and corrective actions.

(2) Each Copermittee shall develop and implement a program to verify that approved treatment control BMPs are operating effectively and have been adequately maintained. At a minimum, the program shall include the following:

(a) An annual inventory of all approved treatment control BMPs within the Copermittee's jurisdiction. The inventory shall also include all treatment control BMPs approved during the previous permit cycle.

[6] Except with regard to treated nursery runoff or clean storm water runoff.

(b) The prioritization of all projects with approved treatment control BMPs into high, medium, and low priority categories. At a minimum, projects with drainage insert treatment control BMPs shall be designated as at least a medium priority. Prioritization of other projects with treatment control BMPs shall include consideration of treatment control BMP size, recommended maintenance frequency, likelihood of operational and maintenance issues, location, receiving water quality, and other pertinent factors.

(c) 100% of projects with treatment control BMPs that are high priority shall be inspected by the Copermittee annually. 50% of projects with drainage insert treatment control BMPs shall be inspected by the Copermittee annually. Treatment control BMPs that are low priority shall be inspected as needed. All inspections shall verify effective operation and maintenance of the treatment control BMPs, as well as compliance with all ordinances, permits, and this Order. A minimum of 20% of the total number of projects with approved treatment control BMPs, and a maximum of 200% of the average number of projects with treatment control BMPs approved per year, shall be inspected annually.

(d) Requirement of annual verification of effective operation and maintenance of each approved treatment control BMP by the party responsible for the treatment control BMP maintenance.

(3) Operation and maintenance verifications shall be required prior to each rainy season.

(4) Inspections of high priority treatment control BMPs shall be conducted prior to each rainy season.

f. BMP VERIFICATION

Prior to occupancy of each Priority Development Project subject to SUSMP requirements, each Copermittee shall inspect the constructed LID, source control, and treatment control BMPs to verify that they have been constructed in compliance with all specifications, plans, permits, ordinances, and this Order. This initial BMP verification inspection does not constitute an operation and maintenance inspection, as required above in section D.1.e.(2)(c).

g. HYDROMODIFICATION - LIMITATIONS ON INCREASES OF RUNOFF DISCHARGE RATES AND DURATIONS[7]

Each Copermittee shall collaborate with the other Copermittees to develop and implement a Hydromodification Management Plan (HMP) to manage increases in runoff discharge rates and durations from all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel

[7] Updated SUSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SUSMP or hydromodification requirement commences. If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project. Where feasible, the Copermittees shall utilize the SUSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SUSMP and hydromodification requirements in their plans.

beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force. The HMP, once approved by the Regional Board, shall be incorporated into the local SUSMP and implemented by each Copermittee so that post-project runoff discharge rates and durations shall not exceed estimated pre-project discharge 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.

(1) The HMP shall:

(a) Identify a standard for channel segments which receive urban runoff discharges from Priority Development Projects. The channel standard shall maintain the pre-project erosion and deposition characteristics of channel segments receiving urban runoff discharges from Priority Development Projects as necessary to maintain or improve the channel segments' stability conditions.

(b) Utilize continuous simulation of the entire rainfall record to identify a range of runoff flows[8] for which Priority Development Project post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations, where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the flow rates and durations. The lower boundary of the range of runoff flows identified shall correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks. The identified range of runoff flows may be different for specific watersheds, channels, or channel reaches.

(c) Require Priority Development Projects to implement hydrologic control measures so that Priority Development Projects' post-project runoff flow rates and durations (1) do not exceed pre-project runoff flow rates and durations for the range of runoff flows identified under section D.1.g.(1)(b), where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the flow rates and durations, and (2) do not result in channel conditions which do not meet the channel standard developed under section D.1.g.(1)(a) for channel segments downstream of Priority Development Project discharge points.

(d) Include other performance criteria (numeric or otherwise) for Priority Development Projects as necessary to prevent urban runoff from the projects from increasing erosion of channel beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

(e) Include a review of pertinent literature.

(f) Include a protocol to evaluate potential hydrograph change impacts to downstream watercourses from Priority Development Projects.

(g) Include a description of how the Copermittees will incorporate the HMP requirements into their local approval processes.

[8] The identified range of runoff flows to be controlled should be expressed in terms of peak flow rates of rainfall events, such as "10% of the pre-project 2-year peak flow up to the pre-project 10-year peak flow."

(h) Include criteria on selection and design of management practices and measures (such as detention, retention, and infiltration) to control flow rates and durations and address potential hydromodification impacts.
(i) Include technical information supporting any standards and criteria proposed.
(j) Include a description of inspections and maintenance to be conducted for management practices and measures to control flow rates and durations and address potential hydromodification impacts.
(k) Include a description of pre- and post-project monitoring and other program evaluations to be conducted to assess the effectiveness of implementation of the HMP.
(l) Include mechanisms for addressing cumulative impacts within a watershed on channel morphology.
(m) Include information on evaluation of channel form and condition, including slope, discharge, vegetation, underlying geology, and other information, as appropriate.

(2) The HMP may include implementation of planning measures (e.g., buffers and restoration activities, including revegetation, use of less-impacting facilities at the point(s) of discharge, etc.) to allow expected changes in stream channel cross sections, vegetation, and discharge rates, velocities, and/or durations without adverse impacts to channel beneficial uses. Such measures shall not include utilization of non-naturally occurring hardscape materials such as concrete, riprap, gabions, etc.

(3) Section D.1.g.(1)(c) does not apply to Development Projects where the project discharges stormwater runoff into channels or storm drains where the pre-existing channel or storm drain conditions result in minimal potential for erosion or other impacts to beneficial uses. Such situations may include discharges into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackrete, etc.) downstream to their outfall in bays or the ocean; underground storm drains discharging to bays or the ocean; and construction of projects where the sub-watersheds below the projects' discharge points are highly impervious (e.g., >70%) and the potential for single-project and/or cumulative impacts is minimal. Specific criteria for identification of such situations shall be included as a part of the HMP. However, plans to restore a channel reach may re-introduce the applicability of HMP controls, and would need to be addressed in the HMP.

(4) <u>HMP Reporting</u>

The Copermittees shall collaborate to report on HMP development as required in section J.2.a of this Order.

(5) <u>HMP Implementation</u>

180 days after approval of the HMP by the Regional Board, each Copermittee shall incorporate into its local SUSMP and implement the HMP for all applicable Priority Development Projects. Prior to approval of the HMP by the Regional Board, the early implementation of measures likely to be included in the HMP shall be encouraged by the Copermittees.

(6) Interim Hydromodification Criteria for Projects Disturbing 50 Acres or More

Within 365 days of adoption of this Order, the Copermittees shall collectively identify 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 (Interim Hydromodification Criteria), where the increased discharge flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in flow rates and durations. Development of the Interim Hydromodification Criteria shall include identification of methods to be used by Priority Development Projects to exhibit compliance with the criteria, including continuous simulation of the entire rainfall record. Starting 365 days after adoption of this Order and until the final Hydromodification Management Plan standard and criteria are implemented, each Copermittee shall require Priority Development Projects disturbing 50 acres or more to implement hydrologic controls to manage post-project runoff flow rates and durations as required by the Interim Hydromodification Criteria. Development Projects disturbing 50 acres or more are exempt from this requirement 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%).

h. ENFORCEMENT OF DEVELOPMENT SITES

Each Copermittee shall enforce its storm water ordinance for all Development Projects and at all development sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include appropriate sanctions to achieve compliance. Sanctions shall include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit or occupancy denials for non-compliance.

2. Construction Component

Each Copermittee shall implement a construction program which meets the requirements of this section, reduces construction site discharges of pollutants from the MS4 to the MEP, and prevents construction site discharges from the MS4 from causing or contributing to a violation of water quality standards.

a. ORDINANCE UPDATE AND APPROVAL PROCESS

(1) Within 365 days of adoption of this Order, each Copermittee shall review and update its grading ordinances and other ordinances as necessary to achieve full compliance with this Order, including requirements for the implementation of all designated BMPs and other measures.

(2) Prior to approval and issuance of local construction and grading permits, each Copermittee shall:

(a) Require all individual proposed construction sites to implement designated BMPs and other measures so that pollutants discharged from the site will be reduced to the maximum extent practicable and will not cause or contribute to a violation of water quality standards.
(b) Prior to permit issuance, require and review the project proponent's storm water management plan to verify compliance with their grading ordinance, other ordinances, and this Order.
(c) Verify that project proponents subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities, (hereinafter General Construction Permit), have existing coverage under the General Construction Permit.

b. SOURCE IDENTIFICATION

Each Copermittee shall maintain and update monthly a watershed based inventory of all construction sites within its jurisdiction. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended.

c. BMP IMPLEMENTATION

(1) Each Copermittee shall designate a minimum set of BMPs and other measures to be implemented at construction sites. The designated minimum set of BMPs shall include, at a minimum:

(a) General Site Management

i. Pollution prevention, where appropriate.
ii. Development and implementation of a storm water management plan.
iii. Minimization of areas that are cleared and graded to only the portion of the site that is necessary for construction;
iv. Minimization of exposure time of disturbed soil areas;
v. Minimization of grading during the wet season and correlation of grading with seasonal dry weather periods to the extent feasible.
vi. Limitation of grading to a maximum disturbed area as determined by each Copermittee before either temporary or permanent erosion controls are implemented to prevent storm water pollution. The Copermittee has the option of temporarily increasing the size of disturbed soil areas by a set amount beyond the maximum, if the individual site is in compliance with applicable storm water regulations and the site has adequate control practices implemented to prevent storm water pollution.
vii. Temporary stabilization and reseeding of disturbed soil areas as rapidly as feasible;
viii. Preservation of natural hydrologic features where feasible;
ix. Preservation of riparian buffers and corridors where feasible;
x. Maintenance of all BMPs, until removed; and
xi. Retention, reduction, and proper management of all pollutant discharges on site to the MEP standard.

(b) Erosion and Sediment Controls

i. Erosion prevention, to be used as the most important measure for keeping sediment on site during construction, but never as the single method;
ii. Sediment controls, to be used as a supplement to erosion prevention for keeping sediment on-site during construction;
iii. Slope stabilization on all inactive slopes during the rainy season and during rain events in the dry season;
iv. Slope stabilization on all active slopes during rain events regardless of the season; and
v. Permanent revegetation or landscaping as early as feasible.

(2) Each Copermittee shall require implementation of advanced treatment for sediment at construction sites that are determined by the Copermittee to be an exceptional threat to water quality. In evaluating the threat to water quality, the following factors shall be considered by the Copermittee:

(a) Soil erosion potential or soil type;
(b) The site's slopes;
(c) Project size and type;
(d) Sensitivity of receiving water bodies;
(e) Proximity to receiving water bodies;
(f) Non-storm water discharges;
(g) Ineffectiveness of other BMPs; and
(h) Any other relevant factors.

(3) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order at each construction site within its jurisdiction year round. However, BMP implementation requirements can vary based on wet and dry seasons. Dry season BMP implementation must plan for and address rain events that may occur during the dry season.

(4) Each Copermittee shall implement, or require implementation of, additional controls for construction sites tributary to CWA section 303(d) water body segments impaired for sediment as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for construction sites within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section Attachment C of this Order) as necessary to comply with this Order.

d. INSPECTION OF CONSTRUCTION SITES

Each Copermittee shall conduct construction site inspections for compliance with its local ordinances (grading, storm water, etc.), permits (construction, grading, etc.), and this Order.

(1) During the wet season, each Copermittee shall inspect at least biweekly (every two weeks), all construction sites within its jurisdiction meeting the following

criteria:

(a) All sites 50 acres or more in size and grading will occur during the wet season;
(b) All sites 1 acre or more, and tributary to a CWA section 303(d) water body segment impaired for sediment or within or directly adjacent to or discharging directly to a receiving water within an ESA; and
(c) Other sites determined by the Copermittees or the Regional Board as a significant threat to water quality. In evaluating threat to water quality, the following factors shall be considered:

i. soil erosion potential;
ii. site slope;
iii. project size and type;
iv. sensitivity of receiving water bodies;
v. proximity to receiving water bodies;
vi. non-storm water discharges;
vii. past record of non-compliance by the operators of the construction site; and
viii. any other relevant factors.

(2) During the wet season, each Copermittee shall inspect at least monthly, all construction sites with one acre or more of soil disturbance not meeting the criteria specified above in section D.2.c.(1).

(3) During the wet season, each Copermittee shall inspect as needed, construction sites less than 1 acre in size.

(4) Each Copermittee shall inspect all construction sites as needed during the dry season.

(5) Based upon site inspection findings, each Copermittee shall implement all follow-up actions (i.e., reinspection, enforcement) necessary to comply with this Order.

(6) Inspections of construction sites shall include, but not be limited to:

(a) Check for coverage under the General Construction Permit (Notice of Intent (NOI) and/or Waste Discharge Identification No.) during initial inspections;
(b) Assessment of compliance with Permittee ordinances and permits related to urban runoff, including the implementation and maintenance of designated minimum BMPs;
(c) Assessment of BMP effectiveness;
(d) Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff;
(e) Education and outreach on storm water pollution prevention, as needed; and
(f) Creation of a written or electronic inspection report.

(7) The Copermittees shall track the number of inspections for the inventoried construction sites throughout the reporting period to verify that the sites are inspected at the minimum frequencies required.

e. ENFORCEMENT OF CONSTRUCTION SITES

Each Copermittee shall develop and implement an escalating enforcement process that achieves prompt corrective actions at construction sites for violations of the Copermittee's water quality protection permit requirements and ordinances. This enforcement process shall include authorizing the Copermittee's construction site inspectors to take immediate enforcement actions when appropriate and necessary. The enforcement process shall include appropriate sanctions such as stop work orders, non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

f. REPORTING OF NON-COMPLIANT SITES

In addition to the notification requirements in section 5(e) of Attachment B, each Copermittee shall notify the Regional Board when the Copermittee issues a stop work order or other high level enforcement to a construction site in their jurisdiction as a result of storm water violations.

3. Existing Development Component

a. MUNICIPAL

Each Copermittee shall implement a municipal program which meets the requirements of this section, reduces municipal discharges of pollutants from the MS4 to the MEP, and prevents municipal discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Source Identification

Each Copermittee shall annually update a watershed based inventory of municipal areas and activities. The inventory shall include the name, address (if applicable), and a description of the area/activity, which pollutants are potentially generated by the area/activity, and identification of whether the area/activity is tributary to a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended when applicable, but not required.

(2) BMP Implementation

(a) Each Copermittee shall implement pollution prevention methods in its municipal program and shall require their use by appropriate municipal departments and personnel, where appropriate.

(b) Each Copermittee shall designate a minimum set of BMPs for all municipal areas and activities. The designated minimum BMPs for municipal areas and activities shall be area or activity specific as appropriate.

(c) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order for each municipal area or activity within its

jurisdiction.

(d) Each Copermittee shall evaluate existing flood control devices to determine if retrofitting the device to provide additional pollutant removal from urban runoff is feasible. When conducting flood control device retrofit projects, each Copermittee shall incorporate permanent pollutant removal measures into the projects, where feasible.

(e) Each Copermittee shall implement, or require implementation of, any additional controls for municipal areas and activities tributary to CWA section 303(d) impaired water body segments (where an area or activity generates pollutants for which the water body segment is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for municipal areas and activities within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order) as necessary to comply with this Order.

(f) Each Copermittee shall implement, or require implementation of, additional controls for special events within their jurisdiction that are expected to generate significant trash and litter. Controls to consider shall include:

i. Temporary screens on catch basins and storm drain inlets;
ii. Temporary fencing to prevent windblown trash from entering adjacent water bodies and MS4 channels;
iii. Proper management of trash and litter;
iv. Catch basin cleaning following the special event and prior to an anticipated rain event;
v. Street sweeping of roads, streets, highways and parking facilities following the special event; and
vi. Other equivalent controls.

(3) <u>Operation and Maintenance of Municipal Separate Storm Sewer System and Structural Controls</u>

(a) Each Copermittee shall implement a schedule of inspection and maintenance activities to verify proper operation of all municipal structural treatment controls designed to reduce pollutant discharges to or from its MS4s and related drainage structures.

(b) Each Copermittee shall implement a schedule of maintenance activities for the MS4 and MS4 facilities (catch basins, storm drain inlets, open channels, etc). The maintenance activities shall, at a minimum, include:

i. Inspection at least once a year between May 1 and September 30 of each year for all MS4 facilities that receive or collect high volumes of trash and debris. All other MS4 facilities shall be inspected at least annually throughout the year.
ii. Following two years of inspections, any MS4 facility that requires inspection and cleaning less than annually may be inspected as needed, but not less that every other year.

iii. Any catch basin or storm drain inlet that has accumulated trash and debris greater than 33% of design capacity shall be cleaned in a timely manner. Any MS4 facility that is designed to be self cleaning shall be cleaned of any accumulated trash and debris immediately. Open channels shall be cleaned of observed anthropogenic litter in a timely manner.
iv. Record keeping of the maintenance and cleaning activities including the overall quantity of waste removed.
v. Proper disposal of waste removed pursuant to applicable laws.
vi. Measures to eliminate waste discharges during MS4 maintenance and cleaning activities.

(4) Management of Pesticides, Herbicides, and Fertilizers

The Copermittees shall implement BMPs to reduce the contribution of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from municipal areas and activities to MS4s. Important municipal areas and activities include municipal facilities, public rights-of-way, parks, recreational facilities, golf courses, cemeteries, botanical or zoological gardens and exhibits, landscaped areas, etc.

Such BMPs shall include, at a minimum: (1) educational activities, permits, certifications and other measures for municipal applicators and distributors; (2) integrated pest management measures that rely on non-chemical solutions; (3) the use of native vegetation; (4) schedules for irrigation and chemical application; and (5) the collection and proper disposal of unused pesticides, herbicides, and fertilizers.

(5) Sweeping of Municipal Areas

Each Copermittee shall implement a program to sweep improved (possessing a curb and gutter) municipal roads, streets, highways, and parking facilities. The program shall include the following measures:

(a) Roads, streets, highways, and parking facilities identified as consistently generating the highest volumes of trash and/or debris shall be swept at least two times per month.

(b) Roads, streets, highways, and parking facilities identified as consistently generating moderate volumes of trash and/or debris shall be swept at least monthly.

(c) Roads, streets, highways, and parking facilities identified as generating low volumes of trash and/or debris shall be swept as necessary, but no less than once per year.

(6) Infiltration From Sanitary Sewer to MS4/Provide Preventive Maintenance of Both

Each Copermittee shall implement controls and measures to prevent and eliminate infiltration of seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. Each Copermittee that

operates both a municipal sanitary sewer system and a MS4 shall implement controls and measures to prevent and eliminate infiltration of seepage from the municipal sanitary sewers to the MS4s that shall include overall sanitary sewer and MS4 surveys and thorough, routine preventive maintenance of both.

(7) Inspection of Municipal Areas and Activities

(a) At a minimum, each Copermittee shall inspect the following high priority municipal areas and activities annually:

i. Roads, Streets, Highways, and Parking Facilities.
ii. Flood Management Projects and Flood Control Devices.
iii. Areas and activities tributary to a C WA section 303(d) impaired water body segment, where an area or activity generates pollutants for which the water body segment is impaired. Areas and activities within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).
iv. Municipal Facilities.
[1] Active or closed municipal landfills;
[2] Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewage collection systems;
[3] Solid waste transfer facilities;
[4] Land application sites;
[5] Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles; and
[6] Household hazardous waste collection facilities.
v. Municipal airfields.
vi. Parks and recreation facilities.
vii. Special event venues following special events (festivals, sporting events, etc.)
viii. Power washing.
ix. Other municipal areas and activities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(b) Other municipal areas and activities shall be inspected as needed.

(c) Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

(8) Enforcement of Municipal Areas and Activities

Each Copermittee shall enforce its storm water ordinance for all municipal areas and activities as necessary to maintain compliance with this Order.

b. INDUSTRIAL AND COMMERCIAL

Each Copermittee shall implement an industrial and commercial program which meets the requirements of this section, reduces industrial and commercial discharges of pollutants from the MS4 to the MEP, and prevents industrial and commercial discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Source Identification

Each Copermittee shall annually update a watershed-based inventory of all industrial and commercial sites/sources within its jurisdiction (regardless of ownership) that could contribute a significant pollutant load to the MS4. The inventory shall include the following minimum information for each industrial and commercial site/source: name; address; pollutants potentially generated by the site/source (and identification of whether the site/source is tributary to a Clean Water Act section 303(d) water body segment and generates pollutants for which the water body segment is impaired); and a narrative description including SIC codes which best reflects the principal products or services provided by each facility. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended.

At a minimum, the following sites/sources shall be included in the inventory:

(a) Commercial Sites/Sources:

i. Automobile repair, maintenance, fueling, or cleaning;
ii. Airplane repair, maintenance, fueling, or cleaning;
iii. Boat repair, maintenance, fueling, or cleaning;
iv. Equipment repair, maintenance, fueling, or cleaning;
v. Automobile and other vehicle body repair or painting;
vi. Mobile automobile or other vehicle washing;
vii. Automobile (or other vehicle) parking lots and storage facilities;
viii. Retail or wholesale fueling;
ix. Pest control services;
x. Eating or drinking establishments, including food markets;
xi. Mobile carpet, drape or furniture cleaning;
xii. Cement mixing or cutting;
xiii. Masonry;
xiv. Painting and coating;
xv. Botanical or zoological gardens and exhibits;
xvi. Landscaping;
xvii. Nurseries and greenhouses;
xviii. Golf courses, parks and other recreational areas/facilities;
xix. Cemeteries;
xx. Pool and fountain cleaning;
xxi. Marinas;
xxii. Portable sanitary services;
xxiii. Building material retailers and storage;
xxiv. Animal facilities; and
xxv. Power washing services.

(b) Industrial Sites/Sources:

i. Industrial Facilities, as defined at 40 CFR § 122.26(b)(14), including those subject to the General Industrial Permit or other individual NPDES permit;
ii. Operating and closed landfills;
iii. Facilities subject to SARA Title III; and

iv. Hazardous waste treatment, disposal, storage and recovery facilities.

(c) All other commercial or industrial sites/sources tributary to a CWA Section 303(d) impaired water body segment, where the site/source generates pollutants for which the water body segment is impaired. All other commercial or industrial sites/sources within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).

(d) All other commercial or industrial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4.

(2) BMP Implementation

(a) Each Copermittee shall require the use of pollution prevention methods by industrial and commercial sites/sources, where appropriate.

(b) Each Copermittee shall designate a minimum set of BMPs for all industrial and commercial sites/sources. The designated minimum BMPs shall be specific to facility types and pollutant generating activities, as appropriate.

(c) Within the first three years of implementation of the updated Jurisdictional Urban Runoff Management Program, each Copermittee shall notify the owner/operator of each inventoried industrial and commercial site/source of the BMP requirements applicable to the site/source.

(d) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order at each industrial and commercial site/source within its jurisdiction.

(e) Each Copermittee shall implement, or require implementation of, additional controls for industrial and commercial sites/sources tributary to CWA section 303(d) impaired water body segments (where a site/source generates pollutants for which the water body segment is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for industrial and commercial sites/sources within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order) as necessary to comply with this Order.

(3) Inspection of Industrial and Commercial Sites/Sources

(a) Each Copermittee shall conduct industrial and commercial site inspections for compliance with its ordinances, permits, and this Order. Inspections shall include but not be limited to:

i. Review of BMP implementation plans, if the site uses or is required to use such a plan;
ii. Review of facility monitoring data, if the site monitors its runoff;

iii. Check for coverage under the General Industrial Permit (Notice of Intent (NOI) and/or Waste Discharge Identification No.), if applicable;
iv. Assessment of compliance with Copermittee ordinances and permits related to urban runoff;
v. Assessment of BMP implementation, maintenance and effectiveness;
vi. Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and
vii. Education and training on storm water pollution prevention, as conditions warrant.

(b) At a minimum, 50% of all sites (excluding mobile sources) determined to pose a high threat to water quality shall be inspected in the first year of implementation of the updated Jurisdictional Urban Runoff Management Program, regardless of whether this exceeds the number of inspections required in section D.3.b.(3)(c). This requirement shall increase to 100% of the sites in the second year, and 100% annually thereafter. In any year that the total number of required inspection per section D.3.b.(3)(c) exceeds the number of high threat to water quality sites, all high threat to water quality sites shall be inspected. In evaluating threat to water quality, each Copermittee shall address, at a minimum, the following:

i. Type of activity (SIC code);
ii. Materials used at the facility;
iii. Wastes generated;
iv. Pollutant discharge potential;
v. Non-storm water discharges;
vi. Size of facility;
vii. Proximity to receiving water bodies;
viii. Sensitivity of receiving water bodies;
ix. Whether the facility is subject to the General Industrial Permit or an individual NPDES permit;
x. Whether the facility has filed a No Exposure Certification/Notice of Non-Applicability;
xi. Facility design;
xii. Total area of the site, area of the site where industrial or commercial activities occur, and area of the site exposed to rainfall and runoff;
xiii. The facility's compliance history; and
xiv. Any other relevant factors.

(c) At a minimum, 20% of the sites inventoried as required in section D.3.b.(1) above (excluding mobile sources) shall be inspected in the first year of implementation of the updated Jurisdictional Urban Runoff Management Program. This requirement shall increase to 25% of the sites in the second year, and 25% annually thereafter.

(d) Each Copermittee may develop and implement a third party inspection program for verifying industrial and commercial site/source compliance with its ordinances, permits, and this Order. The third party inspections can satisfy up to 30% of the inspection requirements in section D.3.b(3)(c), with the Copermittee having to fulfill the remaining required inspections. To the extent that third party inspections are conducted to fulfill the requirements of

section D.3.b(3)(c), the Copermittee will be responsible for the inspection of an additional site for every three sites inspected by a third party. The additional inspections may be conducted by the Copermittee or a third party inspector. The Copermittees third party inspection program must include the following:

i. A description of facility types proposed to be inspected by third parties, including SIC codes;
ii. A third party inspector certification program;
iii. The inspection requirements described in section D.3.b.(3)(a);
iv. Inspection form templates for third party inspector use;
v. Photo documentation of potential storm water violations identified during the third party inspection;
vi. An annual Copermittee audit of random, representative sites that were inspected by a third party;
vii. An annual Copermittee audit of random, representative third party inspectors;
viii. Reporting to the Copermittee of identified significant potential violations within 24 hours of the third party inspection;
ix. Reporting to the Copermittee of all inspection findings within one week of the inspection being conducted; and
x. Copermittee follow-up and/or enforcement actions for identified potential storm water violations within 2 business days of the inspection or potential violation report receipt.

(e) Based upon site inspection findings, each Copermittee shall implement all follow-up actions and enforcement necessary to comply with this Order.

(f) To the extent that the Regional Board has conducted an inspection of an industrial site during a particular year, the requirement for the responsible Copermittee to inspect this facility during the same year will be satisfied.

(g) The Copermittees shall track the number of inspections for the inventoried industrial and commercial sites/sources throughout the reporting period to verify that the sites/sources are inspected at the minimum frequencies listed in sections D.3.b.(3)(b) and D.3.b.(3)(c).

(4) Regulation of Mobile Businesses

(a) Each Copermittee shall develop and implement a program to reduce the discharge of pollutants from mobile businesses to the MEP. Each Copermittee shall keep as part of their inventory (section D.3.b.(1) above), a listing of mobile businesses known to operate within its jurisdiction. The program shall include:

i. Development and implementation of minimum standards and BMPs to be required for each of the various types of mobile businesses.
ii. Development and implementation of an enforcement strategy which specifically addresses the unique characteristics of mobile businesses.
iii. Notification of those mobile businesses known to operate within the Copermittee's jurisdiction of the minimum standards and BMP requirements and local ordinances.

iv. Development and implementation of an outreach and education strategy.
v. Inspection of mobile businesses as needed.

(b) If they choose to, the Copermittees may cooperate in developing and implementing their programs for mobile businesses, including sharing of mobile business inventories, BMP requirements, enforcement action information, and education.

(5) Enforcement of Industrial and Commercial Sites/Sources

Each Copermittee shall enforce its storm water ordinance for all industrial and commercial sites/sources as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include appropriate sanctions to achieve compliance. Sanctions shall include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

(6) Reporting of Industrial Non-Filers

As part of each Annual Report, each Copermittee shall report a list of industrial sites, including the name, address, and SIC code, that may require coverage under the General Industrial Permit for which a NOI has not been filed.

c. RESIDENTIAL

Each Copermittee shall implement a residential program which meets the requirements of this section, reduces residential discharges of pollutants from the MS4 to the MEP, and prevents residential discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Threat to Water Quality Prioritization

Each Copermittee shall identify high threat to water quality residential areas and activities. At a minimum, these shall include:

(a) Automobile repair, maintenance, washing, and parking;
(b) Home and garden care activities and product use (pesticides, herbicides, and fertilizers);
(c) Disposal of trash, pet waste, green waste, and household hazardous waste (e.g., paints, cleaning products);
(d) Any other residential source that the Copermittee determines may contribute a significant pollutant load to the MS4;
(e) Any residential areas tributary to a CWA section 303(d) impaired water body, where the residence generates pollutants for which the water body is impaired; and
(f) Any residential areas within or directly adjacent to or discharging directly to a coastal lagoon or other receiving waters within an environmentally sensitive area (as defined in Attachment C of this Order).

(2) BMP Implementation

(a) Each Copermittee shall designate minimum BMPs for high threat to water quality residential areas and activities. The designated minimum BMPs for high threat to water quality municipal areas and activities shall be area or activity specific.
(b) Each Copermittee shall encourage the use of pollution prevention methods by residents, where appropriate.
(c) Each Copermittee shall facilitate the proper management and disposal of used oil, toxic materials, and other household hazardous wastes. Such facilitation shall include educational activities, public information activities, and establishment of collection sites operated by the Copermittee or a private entity. Curbside collection of household hazardous wastes is encouraged.
(d) Each Copermittee shall implement, or require implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order for high threat to water quality residential areas and activities.
(e) Each Copermittee shall implement, or require implementation of, BMPs for residential areas and activities that have not been designated a high threat to water quality, as necessary.
(f) Each Copermittee shall implement, or require implementation of, any additional controls for residential areas and activities tributary to CWA section 303(d) impaired water body segments (where a residential area or activity generates pollutants for which the water body segment is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for residential areas within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section Attachment C of this Order) as necessary to comply with this Order.

(3) Enforcement of Residential Areas and Activities

Each Copermittee shall enforce its storm water ordinance for all residential areas and activities as necessary to maintain compliance with this Order.

(4) Evaluation of Oversight of Residential Areas and Activities

The Copermittees are encouraged to individually or collectively evaluate their methods used for oversight of residential areas and activities, including assessment of inspections of residential areas and activities. The evaluation should consider various oversight and inspection approaches to identify an effective and appropriate oversight and inspection approach for residential areas and activities.

(5) Regional Residential Education Program

Each Copermittee shall collaborate with the other Copermittees to develop and implement the Regional Residential Education Program required in section F.1 of this Order.

4. Illicit Discharge Detection and Elimination Component

Each Copermittee shall implement an Illicit Discharge Detection and Elimination program which meets the requirements of this section and actively seeks and eliminates illicit discharges and connections.

a. ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee shall implement a program to actively seek and eliminate illicit discharges and connections into its MS4. The program shall include utilization of appropriate municipal personnel to assist in identifying illicit discharges and connections during their daily activities. The program shall address all types of illicit discharges and connections excluding those non-storm water discharges not prohibited by the Copermittee in accordance with section B of this Order.

b. DEVELOP/MAINTAIN MS4 MAP

Each Copermittee shall develop and/or update its labeled map of its entire MS4 and the corresponding drainage areas within its jurisdiction. The use of a GIS is highly recommended. The accuracy of the MS4 map shall be confirmed during dry weather field screening and analytical monitoring and shall be updated at least annually.

c. DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING

Each Copermittee shall conduct dry weather field screening and analytical monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect illicit discharges and connections in accordance with Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

d. INVESTIGATION/INSPECTION AND FOLLOW-UP

(1) Each Copermittee shall investigate and inspect any portion of the MS4 that, based on visual observations, dry weather field screening and analytical monitoring results, or other appropriate information, indicates a reasonable potential for illicit discharges, illicit connections, or other sources of non-storm water (including non-prohibited discharge(s) identified in section B of this Order). Each Copermittee shall develop/update and utilize numeric criteria action levels (or other actions level criteria where appropriate) to determine when follow-up investigations will be performed.

(2) Within two business days of receiving dry weather field screening results that exceed action levels, the Copermittees shall either conduct an investigation to identify the source of the discharge or provide the rationale for why the discharge does not pose a threat to water quality and does not need further investigation. Within two business days, where applicable, of receiving analytical laboratory results that exceed action levels, the Copermittees shall either conduct an investigation to identify the source of the discharge or provide the rationale for why the discharge does not pose a threat to water quality and does not need further investigation. Obvious illicit discharges (i.e. color, odor, or significant exceedances of action levels) shall be investigated immediately.

e. ELIMINATION OF ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee shall take immediate action to eliminate all detected illicit discharges, illicit discharge sources, and illicit connections as soon as possible after detection. Elimination measures may include an escalating series of enforcement actions for those illicit discharges that are not a serious threat to public health or the environment. Illicit discharges that pose a serious threat to the public's health or the environment must be eliminated immediately.

f. ENFORCE ORDINANCES

Each Copermittee shall implement and enforce its ordinances, orders, or other legal authority to prevent illicit discharges and connections to its MS4. Each Copermittee shall also implement and enforce its ordinance, orders, or other legal authority to eliminate detected illicit discharges and connections to it MS4.

g. PREVENT AND RESPOND TO SEWAGE SPILLS (INCLUDING FROM PRIVATE LATERALS AND FAILING SEPTIC SYSTEMS) AND OTHER SPILLS

Each Copermittee shall prevent, respond to, contain and clean up all sewage and other spills that may discharge into its MS4 from any source (including private laterals and failing septic systems). Spill response teams shall prevent entry of spills into the MS4 and contamination of surface water, ground water and soil to the maximum extent practicable. Each Copermittee shall coordinate spill prevention, containment and response activities throughout all appropriate departments, programs and agencies so that maximum water quality protection is available at all times.

Each Copermittee shall develop and implement a mechanism whereby it is notified of all sewage spills from private laterals and failing septic systems into its MS4. Each Copermittee shall prevent, respond to, contain and clean up sewage from any such notification.

h. FACILITATE PUBLIC REPORTING OF ILLICIT DISCHARGES AND CONNECTIONS - PUBLIC HOTLINE

Each Copermittee shall promote, publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s. Each Copermittee shall facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by Copermittees. All storm water hotlines shall be capable of receiving reports in both English and Spanish 24 hours per day / seven days per week. Copermittees shall respond to and resolve each reported incident in a timely manner. All reported incidents, and how each was resolved, shall be summarized in each Copermittee's individual JURMP Annual Report.

5. Education Component

Each Copermittee shall implement an education program using all media as appropriate to (1) measurably increase the knowledge of the target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to measurably change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment. At a minimum, the education

program shall meet the requirements of this section and address the following target communities:

- Municipal Departments and Personnel
- Construction Site Owners and Developers
- Industrial Owners and Operators
- Commercial Owners and Operators
- Residential Community, General Public, and School Children

a. GENERAL REQUIREMENTS

(1) Each Copermittee shall educate each target community on the following topics where appropriate:

Table 3. Education

Laws, Regulations, Permits, & Requirements	**Best Management Practices**
• Federal, state, and local water quality laws and regulations • Statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction). • Statewide General NPDES Permit for Storm Water Discharges Associated with Construction Activities • Regional Board's General NPDES Permit for Ground Water Dewatering • Regional Board's 401 Water Quality Certification Program • Statewide General NPDES Utility Vault Permit • Requirements of local municipal permits and ordinances (e.g., storm water and grading ordinances and permits)	• Pollution prevention and safe alternatives • Good housekeeping (e.g., sweeping impervious surfaces instead of hosing) • Proper waste disposal (e.g., garbage, pet/animal waste, green waste, household hazardous materials, appliances, tires, furniture, vehicles, boat/recreational vehicle waste, catch basin/ MS4 cleanout waste) • Non-storm water disposal alternatives (e.g., all wash waters) • Methods to minimized the impact of land development and construction • Erosion prevention • Methods to reduce the impact of residential and charity car-washing • Preventive Maintenance • Equipment/vehicle maintenance and repair • Spill response, containment, and recovery • Recycling • BMP maintenance
General Urban Runoff Concepts	**Other Topics**
• Impacts of urban runoff on receiving waters • Distinction between MS4s and sanitary sewers • BMP types: facility or activity specific, LID, source control, and treatment control • Short- and long-term water quality impacts associated with urbanization (e.g., land-use decisions, development, construction) • Non-storm water discharge prohibitions • How to conduct a storm water inspections	• Public reporting mechanisms • Water quality awareness for Emergency/ First Responders • Illicit Discharge Detection and Elimination observations and follow-up during daily work activities • Potable water discharges to the MS4 • Dechlorination techniques • Hydrostatic testing • Integrated pest management • Benefits of native vegetation • Water conservation

	• Alternative materials and designs to maintain peak runoff values • Traffic reduction, alternative fuel use

(2) Copermittee educational programs shall emphasize underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges, including various ethnic and socioeconomic groups and mobile sources.

b. SPECIFIC REQUIREMENTS

(1) Municipal Departments and Personnel Education

(a) Municipal Development Planning – Each Copermittee shall implement an education program so that its planning and development review staffs (and Planning Boards and Elected Officials, if applicable) have an understanding of:

i. Federal, state, and local water quality laws and regulations applicable to Development Projects;
ii. The connection between land use decisions and short and long-term water quality impacts (i.e., impacts from land development and urbanization);
iii. How to integrate LID BMP requirements into the local regulatory program(s) and requirements; and
iv. Methods of minimizing impacts to receiving water quality resulting from development, including:
[1] Storm water management plan development and review;
[2] Methods to control downstream erosion impacts;
[3] Identification of pollutants of concern;
[4] LID BMP techniques;
[5] Source control BMPs; and
[6] Selection of the most effective treatment control BMPs for the pollutants of concern.

(b) Municipal Construction Activities – Each Copermittee shall implement an education program that includes annual training prior to the rainy season so that its construction, building, code enforcement, and grading review staffs, inspectors, and other responsible construction staff have, at a minimum, an understanding of the following topics, as appropriate for the target audience:

i. Federal, state, and local water quality laws and regulations applicable to construction and grading activities.
ii. The connection between construction activities and water quality impacts (i.e., impacts from land development and urbanization and impacts from construction material such as sediment).
iii. Proper implementation of erosion and sediment control and other BMPs to minimize the impacts to receiving water quality resulting from construction activities.
iv. The Copermittee's inspection, plan review, and enforcement policies and procedures to verify consistent application.
v. Current advancements in BMP technologies.

vi. SUSMP Requirements including treatment options, LID BMPs, source control, and applicable tracking mechanisms.

(c) Municipal Industrial/Commercial Activities - Each Copermittee shall train staff responsible for conducting storm water compliance inspections and enforcement of industrial and commercial facilities at least once a year. Training shall cover inspection and enforcement procedures, BMP implementation, and reviewing monitoring data.

(d) Municipal Other Activities – Each Copermittee shall implement an education program so that municipal personnel and contractors performing activities which generate pollutants have an understanding of the activity specific BMPs for each activity to be performed.

(2) New Development and Construction Education

As early in the planning and development process as possible and all through the permitting and construction process, each Copermittee shall implement a program to educate project applicants, developers, contractors, property owners, community planning groups, and other responsible parties. The education program shall provide an understanding of the topics listed in Sections D.5.b.(1)(a) and D.5.b.(1)(b) above, as appropriate for the audience being educated. The education program shall also educate project applicants, developers, contractors, property owners, and other responsible parties on the importance of educating all construction workers in the field about stormwater issues and BMPs though formal or informal training.

(3) Residential, General Public, and School Children Education

Each Copermittee shall collaboratively conduct or participate in development and implementation of a plan to educate residential, general public, and school children target communities. The plan shall evaluate use of mass media, mailers, door hangers, booths at public events, classroom education, field trips, hands-on experiences, or other educational methods.

6. Public Participation Component

Each Copermittee shall incorporate a mechanism for public participation in the updating, development, and implementation of the Jurisdictional Urban Runoff Management Program.

E. WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM

1. Each Copermittee shall implement all requirements of section E of this Order no later than 365 days after adoption of this Order, unless otherwise specified in this Order. Prior to 365 days after adoption of this Order, each Copermittee shall collaborate with the other Copermittees within its Watershed Management Area(s) (WMA) to at a minimum implement its Watershed URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01.

2. Each Copermittee shall collaborate with other Copermittees within its WMA(s) as shown in Table 4 below to develop and implement an updated Watershed Urban Runoff

Management Program for each watershed. Each updated Watershed Urban Runoff Management Program shall meet the requirements of section E of this Order, reduce the discharge of pollutants from the MS4 to the MEP, and prevent urban runoff discharges from the MS4 from causing or contributing to a violation of water quality standards. At a minimum, each Watershed Urban Runoff Management Program shall include the elements described below:

a. Lead Watershed Permittee Identification

Watershed Copermittees shall identify the Lead Watershed Permittee for their WMA. In the event that a Lead Watershed Permittee is not selected and identified by the Watershed Copermittees, by default the Copermittee identified in Table 4 as the Lead Watershed Permittee for that WMA shall be responsible for implementing the requirements of the Lead Watershed Permittee in that WMA. The Lead Watershed Copermittees shall serve as liaisons between the Copermittees and Regional Board, where appropriate.

b. Watershed Map

Watershed Copermittees shall develop and periodically update a map of the WMA to facilitate planning, assessment, and collaborative decision-making. As determined appropriate, the map shall include features such as receiving waters (including the Pacific Ocean); Clean Water Act section 303(d) impaired receiving waters; land uses, MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

c. Watershed Water Quality Assessment

Watershed Copermittees shall annually assess the water quality of receiving waters in their WMA. This assessment shall use applicable water quality data, reports, and analysis generated in accordance with the requirements of the Receiving Waters Monitoring and Reporting Program, as well as applicable information available from other public and private organizations.

The assessment and analysis shall annually identify the WMA's water quality problems that are partially or fully attributable to MS4 discharges. Identified water quality problems shall include CWA section 303(d) listings, persistent violations of water quality standards, toxicity, impacts to beneficial uses, and other pertinent conditions. From the list of water quality problems, the high priority water quality problems of the WMA shall be identified, which shall include those water quality problems which most significantly exceed or impact water quality standards (water quality objectives and beneficial uses).

The assessment shall include annual identification of the likely sources of the WMA's high priority water quality problems.

d. Watershed-based Land Use Planning

The Watershed Copermittees shall develop, implement, and modify, as necessary, a program for encouraging collaborative, watershed-based, land use planning in their jurisdictional planning departments.

e. Watershed Strategy

Watershed Copermittees shall develop and implement a collective watershed strategy to abate the sources and reduce the discharge of pollutants causing the high priority water quality problems of the WMA. The strategy shall guide Watershed Copermittee selection and implementation of Watershed Activities, so that the Watershed Activities selected and implemented are appropriate for each Watershed Copermittee's contribution to the WMA's high priority water quality problems.

f. Watershed Activities

(1) The Watershed Copermittees shall identify and implement Watershed Activities that address the high priority water quality problems in the WMA. Watershed Activities shall include both Watershed Water Quality Activities and Watershed Education Activities. These activities may be implemented individually or collectively, and may be implemented at the regional, watershed, or jurisdictional level.

(a) Watershed Water Quality Activities are activities other than education that address the high priority water quality problems in the WMA. A Watershed Water Quality Activity implemented on a jurisdictional basis must be organized and implemented to target a watershed's high priority water quality problems or must exceed the baseline jurisdictional requirements of section D of this Order.
(b) Watershed Education Activities are outreach and training activities that address high priority water quality problems in the WMA.

(2) A Watershed Activities List shall be submitted with each updated WURMP and updated annually thereafter. The Watershed Activities List shall include both Watershed Water Quality Activities and Watershed Education Activities, along with a description of how each activity was selected, and how all of the activities on the list will collectively abate sources and reduce pollutant discharges causing the identified high priority water quality problems in the WMA.

(3) Each activity on the Watershed Activities List shall include the following information:

(a) A description of the activity;
(b) A time schedule for implementation of the activity, including key milestones;
(c) An identification of the specific responsibilities of Watershed Copermittees in completing the activity;
(d) A description of how the activity will address the identified high priority water quality problem(s) of the watershed;
(e) A description of how the activity is consistent with the collective watershed strategy;
(f) A description of the expected benefits of implementing the activity; and
(g) A description of how implementation effectiveness will be measured.

(4) Each Watershed Copermittee shall implement identified Watershed Activities pursuant to established schedules. For each Permit year, no less than two Watershed Water Quality Activities and two Watershed Education Activities shall be in an active implementation phase. A Watershed Water Quality Activity

is in an active implementation phase when significant pollutant load reductions, source abatement, or other quantifiable benefits to discharge or receiving water quality can reasonably be established in relation to the watershed's high priority water quality problem(s). Watershed Water Quality Activities that are capital projects are in active implementation for the first year of implementation only. A Watershed Education Activity is in an active implementation phase when changes in attitudes, knowledge, awareness, or behavior can reasonably be established in target audiences.

g. Copermittee Collaboration

Watershed Copermittees shall collaborate to develop and implement the Watershed Urban Runoff Management Programs. Watershed Copermittee collaboration shall include frequent regularly scheduled meetings.

h. Public Participation

Watershed Copermittees shall implement a watershed-specific public participation mechanism within each watershed. The mechanism shall encourage participation from other organizations within the watershed (such as the Department of Defense, Caltrans, lagoon foundations, etc.)

i. WURMP Review and Updates

Each WURMP shall be reviewed annually to identify needed modifications and improvements. Pursuant to the requirements of Section I.2.b of this Order the Watershed Copermittees shall develop and implement a plan and schedule to address the identified modifications and improvements. All updates to the WURMP shall be documented in the Watershed Urban Runoff Management Program Annual Reports. Individual Watershed Copermittees shall also review and modify their jurisdictional activities and JURMPs as necessary so that they are consistent with the requirements of the WURMP.

Table 4. Watershed Management Areas and Watershed Copermittees

RESPONSIBLE WATERSHED COPERMITTEE(S)	WATERSHED MANAGEMENT AREA	HYDROLOGIC UNIT OR AREA	MAJOR RECEIVING WATER BODIES
1. County of San Diego	Santa Margarita River	Santa Margarita HU (902.00)	Santa Margarita River and Estuary, Pacific Ocean
2. City of Oceanside 3. City of Vista 4. County of San Diego	San Luis Rey River	San Luis Rey HU (903.00)	San Luis Rey River and Estuary, Pacific Ocean
1. City of Carlsbad **2. City of Encinitas** 3. City of Escondido 4. City of Oceanside 5. City of San Marcos 6. City of Solana Beach 7. City of Vista 8. County of San Diego	Carlsbad	Carlsbad HU (904.00)	Batiquitos Lagoon San Elijo Lagoon Agua Hedionda Lagoon Buena Vista Lagoon and Tributary Streams Pacific Ocean
1. City of Del Mar 2. **City of Escondido** 3. City of Poway 4. City of San Diego 5. City of Solana Beach 6. County of San Diego	San Dieguito River	San Dieguito HU (905.00)	San Dieguito River and Estuary Pacific Ocean

RESPONSIBLE WATERSHED COPERMITTEE(S)	WATERSHED MANAGEMENT AREA	HYDROLOGIC UNIT OR AREA	MAJOR RECEIVING WATER BODIES
1. City of Del Mar **2. City of Poway** 3. City of San Diego 4. County of San Diego	Peñasquitos	Miramar Reservoir HA (906.10) Poway HA (906.20)	Los Peñasquitos Creek Los Peñasquitos Lagoon Pacific Ocean
1. City of San Diego	Mission Bay	Scripps HA (906.30) Miramar HA(906.40) Tecolote HA (906.50)	Mission Bay Pacific Ocean
1. City of El Cajon 2. City of La Mesa 3. City of San Diego 4. City of Santee 5. County of San Diego	San Diego River	San Diego HU (907.00)	San Diego River Pacific Ocean
1. City of Chula Vista 2. City of Coronado 3. City of Imperial Beach 4. City of La Mesa 5. City of Lemon Grove 6. City of National City 7. City of San Diego 8. County of San Diego **9. San Diego Unified Port District** 10. San Diego County Regional Airport Authority	San Diego Bay	Pueblo San Diego HU (908.00) Sweetwater HU (909.00) Otay HU (910.00)	San Diego Bay Sweetwater River Otay River Pacific Ocean
1. City of Imperial Beach 2. City of San Diego **3. County of San Diego**	Tijuana River	Tijuana (911.00)	Tijuana River and Estuary Pacific Ocean

- The Lead Watershed Permittee for each watershed is highlighted

F. REGIONAL URBAN RUNOFF MANAGEMENT PROGRAM

The Copermittees shall implement all requirements of section F of this Order no later than 365 days after adoption of this Order, unless otherwise specified in this Order.

Each Copermittee shall collaborate with the other Copermittees to develop, implement, and update as necessary a Regional Urban Runoff Management Program. The Regional Urban Runoff Management Program shall meet the requirements of section F of this Order, reduce the discharge of pollutants from the MS4 to the MEP, and prevent urban runoff discharges from the MS4 from causing or contributing to a violation of water quality standards. The Regional Urban Runoff Management Program shall, at a minimum:

1. Develop and implement a Regional Residential Education Program. The program shall include:
   a. Pollutant specific education which focuses educational efforts on bacteria, nutrients, sediment, pesticides, and trash. If a different pollutant is determined to be more critical for the education program, the pollutant can be substituted for one of these pollutants.
   b. Education efforts focused on the specific residential sources of the pollutants listed in section F.1.a.
2. Develop the standardized fiscal analysis method required in section G of this Order.
3. Facilitate the assessment of the effectiveness of jurisdictional, watershed, and regional programs.

As options, the Regional Urban Runoff Management Program may:

1. Develop and implement urban runoff management activities on a regional level, as determined to be necessary by the Copermittees.

2. Develop and implement a strategy to integrate management, implementation, and reporting of jurisdictional, watershed, and regional activities, as determined to be necessary by the Copermittees. Any such integration shall assure compliance with the jurisdictional requirements of section D and the watershed requirements of section E.
3. Facilitate TMDL management and implementation, as determined to be necessary by the Copermittees.
4. Facilitate development of strategies for implementation of activities on a watershed level, as determined to be necessary by the Copermittees.

G. FISCAL ANALYSIS

1. Each Copermittee shall secure the resources necessary to meet all requirements of this Order.

2. As part of the Regional Urban Runoff Management Program, the Copermittees shall collectively develop a standardized method and format for annually conducting and reporting fiscal analyses of their urban runoff management programs in their entirety (including jurisdictional, watershed, and regional activities). This standardized method shall:

   a. Identify the various categories of expenditures attributable to the urban runoff management programs, including a description of the specific items to be accounted for in each category of expenditures.
   b. Identify expenditures that contribute to multiple programs or were in existence prior to implementation of the urban runoff management program.
   c. Identify a metric or metrics to be used to report program component and total program expenditures.

3. Each Copermittee shall conduct an annual fiscal analysis. Starting January 31, 2010, the annual fiscal analysis shall be conducted consistent with the standardized fiscal analysis method included in the January 31, 2009 Regional Urban Runoff Management Program Annual Report. The annual fiscal analysis shall be conducted and reported on as part of each Copermittee's Jurisdictional Urban Runoff Management Program Annual Reports. For convenience, the fiscal analysis included in the Jurisdictional Urban Runoff Management Program Annual Reports shall address the Copermittee's urban runoff management programs in their entirety, including jurisdictional, watershed, and regional activities. The fiscal analysis shall provide the Copermittee's urban runoff management program budget for the current reporting period. The fiscal analysis shall include a description of the source(s) of the funds that are proposed to be used to meet the necessary expenditures, including legal restrictions on the use of such funds.

H. TOTAL MAXIMUM DAILY LOADS

1. Chollas Creek Diazinon TMDL Water Quality Based Effluent Limits (WQBELs)

   a. The Copermittees in the Chollas Creek watershed shall implement BMPs capable of achieving the interim and final diazinon Waste Load Allocation (WLA) concentration in the storm water discharge in Chollas Creek listed in Table 5.

Table 5. Chollas Creek Diazinon Schedule

Calendar Year	Year	Waste Load Allocation	Interim TMDL Numeric Target	% Reduction
2004	1	0.460 µg/L	0.5 µg/L	0
2005	2	0.460 µg/L	0.5 µg/L	0
2006	3	0.460 µg/L	0.5 µg/L	0
2007	4	0.414 µg/L	0.45 µg/L	10
2008	5	0.322 µg/L	0.35 µg/L	20
2009	6	0.184 µg/L	0.20 µg/L	30
2010	7	0.045 µg/L	0.05 µg/L	30

b. The Copermittees in the Chollas Creek watershed shall not cause or contribute to the violation of the Interim TMDL Numeric Targets in Chollas Creek as listed in Table 5. If the Interim TMDL Numeric Target is violated in Chollas Creek in more than one sample in any three consecutive years, the Copermittees shall submit a report that either 1) documents compliance with the WLA through additional sampling of the urban runoff discharge or 2) demonstrates, using modeling or other technical or scientific basis, the effectiveness of additional BMPs that will be implemented to achieve the WLA. The report may be incorporated into the Watershed Urban Runoff Management Program Annual Report unless the Regional Board directs an earlier submittal. The report shall include an implementation schedule.

c. The Copermittees in the Chollas Creek watershed shall implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, "Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County, August 14, 2002," including subsequent modifications, in order to achieve the WLA listed in Table 5.

2. Shelter Island Yacht Basin WQBELs

a. The Copermittees in the Shelter Island Yacht Basin watershed shall implement BMPs to maintain a total annual copper discharge load of less than or equal to 30 kg copper / year.

b. The Copermittees in the Shelter Island Yacht Basin watershed shall implement, at a minimum, the BMPs included in the Copermittees' Jurisdictional Urban Runoff Management Plan, including subsequent modifications, which address the discharge of copper to achieve the annual copper load in Section H.2.a above.

I. PROGRAM EFFECTIVENESS ASSESSMENT

1. Jurisdictional

a. As part of its Jurisdictional Urban Runoff Management Program, each Copermittee shall annually assess the effectiveness of its Jurisdictional Urban Runoff Management Program implementation. At a minimum, the annual effectiveness assessment shall:

(1) Specifically assess the effectiveness of each of the following:

(a) Each significant jurisdictional activity/BMP or type of jurisdictional activity/BMP implemented;
(b) Implementation of each major component of the Jurisdictional Urban Runoff Management Program (Development Planning, Construction, Municipal, Industrial/Commercial, Residential, Illicit Discharge Detection and Elimination, and Education); and
(c) Implementation of the Jurisdictional Urban Runoff Management Program as a whole.

(2) Identify and utilize measurable targeted outcomes, assessment measures, and assessment methods for each of the items listed in section I.1.a.(1) above.

(3) Utilize outcome levels 1-6[9] to assess the effectiveness of each of the items listed in section I.1.a.(1) above, where applicable and feasible.

(4) Utilize monitoring data and analysis from the Receiving Waters Monitoring Program to assess the effectiveness each of the items listed in section I.1.a.(1) above, where applicable and feasible.

(5) Utilize Implementation Assessment, Water Quality Assessment, and Integrated Assessment, where applicable and feasible.[10]

b. Based on the results of the effectiveness assessment, each Copermittee shall annually review its jurisdictional activities or BMPs to identify modifications and improvements needed to maximize Jurisdictional Urban Runoff Management Program effectiveness, as necessary to achieve compliance with section A of this Order. The Copermittees shall develop and implement a plan and schedule to address the identified modifications and improvements. Jurisdictional activities/BMPs that are ineffective or less effective than other comparable jurisdictional activities/BMPs shall be replaced or improved upon by implementation of more effective jurisdictional activities/BMPs. Where monitoring data exhibits persistent water quality problems that are caused or contributed to by MS4 discharges, jurisdictional activities or BMPs applicable to the water quality problems shall be modified and improved to correct the water quality problems.

c. As part of its Jurisdictional Urban Runoff Management Program Annual Reports, each Copermittee shall report on its Jurisdictional Urban Runoff Management Program effectiveness assessment as implemented under each of the requirements of sections I.1.a and I.1.b above.

2. Watershed

a. As part of its Watershed Urban Runoff Management Program, each watershed group of Copermittees (as identified in Table 4) shall annually assess the effectiveness of its Watershed Urban Runoff Management Program implementation. At a minimum, the annual effectiveness assessment shall:

(1) Specifically assess the effectiveness of each of the following:

[9] Effectiveness assessment outcome levels are defined in Attachment C of this Order.
[10] Implementation Assessment, Water Quality Assessment, and Integrated Assessment are defined in Attachment C of this Order.

(a) Each Watershed Water Quality Activity implemented;
(b) Each Watershed Education Activity implemented; and
(c) Implementation of the Watershed Urban Runoff Management Program as a whole.

(2) Identify and utilize measurable targeted outcomes, assessment measures, and assessment methods for each of the items listed in section I.2.a.(1) above.

(3) Utilize outcome levels 1-6 to assess the effectiveness of each of the items listed in sections I.2.a.(1)(a) and I.2.a.(1)(b) above, where applicable and feasible.

(4) Utilize outcome levels 1-4 to assess the effectiveness of implementation of the Watershed Urban Runoff Management Program as a whole, where applicable and feasible.

(5) Utilize outcome levels 5 and 6 to qualitatively assess the effectiveness of implementation of the Watershed Urban Runoff Management Program as a whole, focusing on the high priority water quality problem(s) of the watershed. These assessments shall attempt to exhibit the impact of Watershed Urban Runoff Management Program implementation on the high priority water quality problem(s) within the watershed.

(6) Utilize monitoring data and analysis from the Receiving Waters Monitoring Program to assess the effectiveness each of the items listed in section I.2.a.(1) above, where applicable and feasible.

(7) Utilize Implementation Assessment, Water Quality Assessment, and Integrated Assessment, where applicable and feasible.

b. Based on the results of the effectiveness assessment, the watershed Copermittees shall annually review their Watershed Water Quality Activities, Watershed Education Activities, and other aspects of the Watershed Urban Runoff Management Program to identify modifications and improvements needed to maximize Watershed Urban Runoff Management Program effectiveness, as necessary to achieve compliance with section A of this Order. The Copermittees shall develop and implement a plan and schedule to address the identified modifications and improvements. Watershed Water Quality Activities/Watershed Education Activities that are ineffective or less effective than other comparable Watershed Water Quality Activities/Watershed Education Activities shall be replaced or improved upon by implementation of more effective Watershed Water Quality Activities/Watershed Education Activities. Where monitoring data exhibits persistent water quality problems that are caused or contributed to by MS4 discharges, Watershed Water Quality Activities and Watershed Education Activities applicable to the water quality problems shall be modified and improved to correct the water quality problems.

c. As part of its Watershed Urban Runoff Management Program Annual Reports, each watershed group of Copermittees (as identified in Table 4) shall report on its Watershed Urban Runoff Management Program effectiveness assessment as implemented under each of the requirements of section I.2.a and I.2.b above.

3. Regional

a. As part of the Regional Urban Runoff Management Program, the Copermittees shall annually assess the effectiveness of Regional Urban Runoff Management Program implementation. At a minimum, the annual effectiveness assessment shall:

(1) Specifically assess the effectiveness of each of the following:

(a) Each regional activity/BMP or type of regional activity/BMP implemented, including regional residential education activities; and
(b) The Regional Urban Runoff Management Program as a whole.

(2) Identify and utilize measurable targeted outcomes, assessment measures, and assessment methods for each of the items listed in section I.3.a.(1) above.

(3) Utilize outcome levels 1-6 to assess the effectiveness of each of the items listed in sections I.3.a.(1) above, where applicable and feasible.

(4) Utilize monitoring data and analysis from the Receiving Waters Monitoring Program to assess the effectiveness each of the items listed in section I.3.a.(1) above, where applicable and feasible.

(5) Utilize Implementation Assessment, Water Quality Assessment, and Integrated Assessment, where applicable and feasible.

(6) Include evaluation of whether the Copermittees' jurisdictional, watershed, and regional effectiveness assessments are meeting the following objectives:

(a) Assessment of watershed health and identification of water quality issues and concerns.
(b) Evaluation of the degree to which existing source management priorities are properly targeted to, and effective in addressing, water quality issues and concerns.
(c) Evaluation of the need to address additional pollutant sources not already included in Copermittee programs.
(d) Assessment of progress in implementing Copermittee programs and activities.
(e) Assessment of the effectiveness of Copermittee activities in addressing priority constituents and sources.
(f) Assessment of changes in discharge and receiving water quality.
(g) Assessment of the relationship of program implementation to changes in pollutant loading, discharge quality, and receiving water quality.
(h) Identification of changes necessary to improve Copermittee programs, activities, and effectiveness assessment methods and strategies.

b. Based on the results of the effectiveness assessment, the Copermittees shall annually review their regional activities and other aspects of the Regional Urban Runoff Management Program to identify modifications and improvements needed maximize Regional Urban Runoff Management Program effectiveness, as necessary to achieve compliance with section A of this Order. The Copermittees shall develop and implement a plan and schedule to address the identified modifications and improvements. Regional activities that are ineffective or less effective than other

comparable regional activities shall be replaced or improved upon by implementation of more effective regional activities. Where monitoring data exhibits persistent water quality problems that are caused or contributed to by MS4 discharges, regional activities applicable to the water quality problems shall be modified and improved to correct the water quality problems.

c. Based on the results of the Copermittees' evaluation of their effectiveness assessments, the Copermittees shall modify their effectiveness assessment methods to improve their ability to accurately assess the effectiveness of their urban runoff management programs.

d. As part of its Regional Urban Runoff Management Program Annual Reports, the Copermittees shall report on its Regional Urban Runoff Management Program effectiveness assessment as implemented under each of the requirements of sections I.3.a, I.3.b, and I.3.c above.

4. TMDL BMP Implementation Plan

a. For each TMDL in a watershed, the Copermittees subject to the TMDL within the watershed shall annually assess the effectiveness of its TMDL BMP Implementation Plan or equivalent plan.[11] At a minimum, the annual effectiveness assessment shall:

(1) Specifically assess the effectiveness of each of the following:

(a) Each activity/BMP or type of activity/BMP implemented; and
(b) Implementation of the TMDL BMP Implementation Plan or equivalent plan as a whole.

(2) Identify and utilize measurable targeted outcomes, assessment measures, and assessment methods for each of the items listed in sections I.4.a.(1) above.

(3) Utilize outcome levels 1-6 to assess the effectiveness of each of the items listed in section I.4.a.(1)(a) above, where applicable and feasible.

(4) Utilize outcome levels 1-4 to assess the effectiveness of implementation of the TMDL BMP Implementation Plan or equivalent plan as a whole, where applicable and feasible.

(5) Utilize outcome levels 5 and 6 to qualitatively assess the effectiveness of the TMDL BMP Implementation Plan or equivalent plan as a whole. These assessments shall attempt to exhibit the effects of the TMDL BMP Implementation Plan or equivalent plan on the impairment that is targeted.

b. Based on the results of the effectiveness assessment, the Copermittees subject to the TMDL shall modify their BMPs and other aspects of the TMDL BMP Implementation Plan or equivalent plan in order to maximize TMDL BMP Implementation Plan or equivalent plan effectiveness. BMPs that are ineffective or less effective than other comparable BMPs shall be replaced or improved upon by implementation of more effective BMPs. Where monitoring data exhibits persistent

[11] This requirement applies to those TMDLs where a TMDL BMP Implementation Plan or equivalent plan has been developed and submitted to the Regional Board.

water quality problems that are caused or contributed to by MS4 discharges, BMPs applicable to the water quality problems shall be modified and improved to correct the water quality problems.

c. As part of its Watershed Urban Runoff Management Program Annual Reports, each group of Copermittees subject to a TMDL shall report on any TMDL BMP Implementation Plan or equivalent plan effectiveness assessments as implemented under each of the requirements of sections I.4.a and I.4.b above.

5. Long-term Effectiveness Assessment

a. Each Copermittee shall collaborate with the other Copermittees to develop a Long-term Effectiveness Assessment (LTEA), which shall build on the results of the Copermittees' August 2005 Baseline LTEA. The LTEA shall be submitted by the Principal Permittee to the Regional Board no later than 210 days in advance of the expiration of this Order.

b. The LTEA shall be designed to address each of the objectives listed in section I.3.a.(6) of this Order, and to serve as a basis for the Copermittees' Report of Waste Discharge for the next permit cycle.

c. The LTEA shall address outcome levels 1-6, and shall specifically include an evaluation of program implementation to changes in water quality (outcome levels 5 and 6).

d. The LTEA shall assess the effectiveness of the Receiving Waters Monitoring Program in meeting its objectives and its ability to answer the five core management questions. This shall include assessment of the frequency of monitoring conducted through the use of power analysis and other pertinent statistical methods. The power analysis shall identify the frequency and intensity of sampling needed to identify a 10% reduction in the concentration of constituents causing the high priority water quality problems within each watershed over the next permit term with 80% confidence.

e. The LTEA shall address the jurisdictional, watershed, and regional programs, with an emphasis on watershed assessment.

J. REPORTING

1. Urban Runoff Management Plans

a. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PLANS

(1) Copermittees - The written account of the overall program to be conducted by each Copermittee to meet the jurisdictional requirements of section D of this Order is referred to as the Jurisdictional Urban Runoff Management Plan (JURMP). Each Copermittee shall revise and update its JURMP so that it describes all activities the Copermittee will undertake to implement the requirements of each component of Jurisdictional Urban Runoff Management Program section D of this Order. Each Copermittee shall submit its updated and revised JURMP to the Principal Permittee by the date specified by the Principal

Permittee.

(2) Principal Permittee –The Principal Permittee shall be responsible for collecting and assembling the individual JURMPs which cover the activities conducted by each individual Copermittee. The Principal Permittee shall submit the JURMPs to the Regional Board 365 days after adoption of this Order.

(3) At a minimum, each Copermittee's JURMP shall be updated and revised to contain the following information:

(a) Non-Storm Water Discharges
   i. Identification of non-storm water discharge categories identified as a source of pollutants to waters of the U.S.
   ii. A description of whether non-storm water discharge categories identified under section (a)i above will be prohibited or required to implement appropriate control measures to reduce the discharge of pollutants to the MEP.
   iii. Identification of any control measures to be required and implemented for non-storm water discharge categories identified under section (a)i above.
   iv. A description of a program to reduce pollutants from non-emergency fire fighting flows identified by the Copermittee to be significant sources of pollutants.

(b) Administrative and Legal Procedures
   i. Certified statement by the chief legal counsel that the Copermittee has adequate legal authority to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order.
   ii. Identification of all departments within the jurisdiction that conduct urban runoff related activities, and their roles and responsibilities under the Order. Include an up-to-date organizational chart specifying these departments and key personnel.
   iii. Updated urban runoff related ordinances, with explanations of how they are enforceable.
   iv. Identification of the local administrative and legal procedures available to mandate compliance with urban runoff related ordinances and therefore with the conditions of the Order.
   v. Description of how urban runoff related ordinances are implemented and appealed.
   vi. Description of whether the municipality can issue administrative orders and injunctions or if it must go through the court system for enforcement actions.

(c) Development Planning
   i. A description of the water quality and watershed protection principles that have been or will be included in the Copermittee's General Plan, and a time schedule for when modifications are planned, if applicable.
   ii. A description of the Copermittee's current environmental review process and how it addresses impacts to water quality and appropriate mitigation measures. If the Copermittee plans to modify the process during the permit term, a time schedule for modifications shall be included.

iii. A description of the development project approval process and requirements.
iv. An updated SUSMP document that meets the applicable requirements specified in sections D.1.d and D.1.g(6), including a description of LID BMP requirements to be used prior to the Model SUSMP update. The updated SUSMP may be submitted under separate cover as an attachment to the JURMP.
v. A description of the database to be used to track and inventory approved treatment control BMPs and treatment control BMP maintenance.
vi. A completed watershed-based inventory of approved treatment control BMPs.
vii. A description of the program to be implemented to verify approved treatment control BMPs are operating effectively and have been adequately maintained, including information on treatment control BMP inventory, prioritization, inspection, and annual verification.
viii. A description of inspections that will be conducted to verify BMPs have been constructed according to requirements.
ix. A description of collaboration efforts to be conducted to develop the HMP.
x. A description of enforcement mechanisms and how they will be used.

(d) Construction
i. Updated grading and other applicable ordinances.
ii. A description of the construction and grading approval processes.
iii. Updated construction and grading project requirements.
iv. A completed watershed-based inventory of all construction sites.
v. A description of steps that will be taken to maintain and update monthly a watershed-based inventory of all construction sites.
vi. A list and description of the minimum BMPs that will be implemented, or required to be implemented, including pollution prevention.
vii. A description of the maximum disturbed area allowed for grading before either temporary or permanent erosion controls are implemented.
viii. A description of construction site conditions where advanced treatment will be required.
ix. A description of the steps that will be taken to require and verify the implementation of the designated BMPs at all construction sites.
x. A description of planned inspection frequencies.
xi. A description of inspection procedures.
xii. A description of steps that will be taken to track construction site inspections to verify that all construction sites are inspected at the minimum frequencies required.
xiii. A description of available enforcement mechanisms, under what conditions each will be used, and how they will escalate.
xiv. A description of notification procedures for non-compliant sites.

(e) Municipal
i. A completed inventory of all municipal facilities and activities.
ii. A description of which BMPs will be implemented, or required to be implemented, for municipal facilities and activities, including pollution prevention.
iii. A description of which BMPs will be implemented, or required to be implemented, for special events.

iv. A description of steps that will be taken to require and verify the implementation of designated BMPs at municipal facilities and activities.
v. A description of MS4 and MS4 facility inspection and maintenance activities and schedules.
vi. A description of the management strategy and BMPs to be implemented for pesticides, herbicides, and fertilizer use.
vii. A description of street and parking facility sweeping activities and schedules.
viii. A description of controls and measures to be implemented to prevent and eliminate infiltration of seepage from sanitary sewers to MS4s.
ix. A description of inspection frequencies and procedures.
x. A description of enforcement mechanisms and how they will be used.

(f) Industrial and Commercial
i. A completed and prioritized inventory of all industrial and commercial sites/sources that could contribute a significant pollutant load to the MS4.
ii. A list of minimum BMPs that will be implemented, or required to be implemented, for each facility type or pollutant-generating activity, including pollution prevention.
iii. A description of the steps that will be taken to require and verify the implementation of designated BMPs, including notification efforts.
iv. Identification of high priority sites/sources and sites/sources to be inspected during the first year of implementation.
v. A description of the steps taken to identify sites/sources to be inspected during the first year of implementation, including rationale for their selection.
vi. A description of steps that will be taken to identify sites/sources to be inspected in subsequent years.
vii. A description of inspection procedures.
viii. A description of any third party inspection program to be implemented.
ix. A description of the program to be implemented to regulate mobile businesses, including notification of BMP requirements and local ordinances.
x. A description of enforcement mechanisms and how they will be used.
xi. A description of steps that will be taken to identify non-filers and notify the Regional Board of non-filers.

(g) Residential
i. A list of residential areas and activities that have been identified as high priority.
ii. A list of minimum BMPs that will be implemented, or required to be implemented, for high priority residential activities.
iii. A description of which pollution prevention methods will be encouraged for implementation, and the steps that will be taken to encourage implementation.
iv. A description of the steps that will be taken to require and verify the implementation of prescribed BMPs for high priority residential activities.
v. A description of efforts to facilitate proper disposal of used oil and other toxic materials.

vi. A description of efforts to evaluate methods used for oversight of residential areas and activities.
vii. A description of enforcement mechanisms and how they will be used.

(h) Illicit Discharge Detection and Elimination
i. A description of the program to actively seek and eliminate illicit discharges and illicit connections.
ii. An updated MS4 map, including locations of the MS4, dry weather field screening and analytical monitoring sites, and watersheds.
iii. A description of dry weather field screening and analytical monitoring to be conducted (including procedures) which addresses all requirements included in sections B.1-4 of Receiving Waters Monitoring and Reporting Program No. R9-2006-0011.
iv. A description of investigation and inspection procedures to follow up on dry weather monitoring results or other information which indicate potential for illicit discharges and illicit connections.
v. A description of procedures to eliminate detected illicit discharges and illicit connections.
vi. A description of enforcement mechanisms and how they will be used.
vii. A description of the mechanism to receive notification of spills.
viii. A description of measures to prevent, respond to, contain, and clean up all sewage and other spills.
ix. A description of efforts to facilitate public reporting of illicit discharges and connections, including a public hotline.

(i) Education
i. A description of the content, form, and frequency of education efforts for each target community.
ii. A description of steps to be taken to educate underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges, including various ethnic and socioeconomic groups and mobile sources.
iii. A description of the content, form, and frequency of education efforts targeting municipal staff working on development planning, construction, municipal, industrial/commercial, and other aspects of the Jurisdictional Urban Runoff Management Program.
iv. A description of the content, form, and frequency of education efforts targeting new development and construction target communities.
v. A description of the content, form, and frequency of jurisdictional education efforts for the residential, general public, and school children target communities.

(j) Public Participation
i. A description of the steps that will be taken to include public participation in the development and implementation of each Copermittee's Jurisdictional Urban Runoff Management Program.

(k) Fiscal Analysis
i. A description of the fiscal analysis to be conducted annually, as required by section G of this Order.

(l) Program Effectiveness Assessment

i. A description of steps that will be taken to annually conduct program effectiveness assessments in compliance with section I.1 of the Order.

ii. Identify measurable targeted outcomes, assessment measures, and assessment methods to be used to assess the effectiveness of: (1) Each significant jurisdictional activity or BMP to be implemented; (2) Implementation of each major component of the Jurisdictional Urban Runoff Management Program; and (3) Implementation of the Jurisdictional Urban Runoff Management Program as a whole.

iii. Identify which of the outcome levels 1-6 will be utilized to assess the effectiveness of each of the items listed in sections J.1.a.(3)(l)ii(1-3). Where an outcome level is determined to not be applicable or feasible for an item listed in sections J.1.a.(3)(l)ii(1-3), the Copermittee shall provide a discussion exhibiting inapplicability or infeasibility.

iv. A description of the steps that will be taken to utilize monitoring data to assess the effectiveness of each of the items listed in sections J.1.a.(3)(l)ii(1-3).

v. A description of the steps that will be taken to improve the Copermittee's ability to assess program effectiveness using measurable targeted outcomes, assessment measures, assessment methods, and outcome levels 1-6. Include a time schedule for when improvement will occur.

vi. A description of the steps that will be taken to identify aspects of the Copermittee's Jurisdictional Urban Runoff Management Program that will be changed, based on the results of the effectiveness assessment.

(m) JURMP Modification

i. Identification of the location in the JURMP of any changes made to the JURMP in order to meet the requirements of Order No. R9-2007-0001.

b. WATERSHED URBAN RUNOFF MANAGEMENT PLANS

(1) Copermittees - The written account of the program conducted by each watershed group of Copermittees is referred to as the Watershed Urban Runoff Management Plan (WURMP). The Copermittees within each watershed shall be responsible for updating and revising each WURMP, as specified in Table 4 above. Each WURMP shall be updated and revised to describe all activities the watershed Copermittees will undertake to implement the Watershed Urban Runoff Management Program requirements of section E of this Order.

(2) Lead Watershed Permittee - Each Lead Watershed Permittee shall be responsible for producing its respective WURMP, as well as for coordination and meetings amongst all member watershed Copermittees. Each Lead Watershed Permittee is further responsible for the submittal of the WURMP to the Principal Permittee by the date specified by the Principal Permittee.

(3) Principal Permittee – The Principal Permittee shall assemble and submit the WURMPs to the Regional Board 365 days after adoption of this Order.

(4) Each WURMP shall include:

(a) Identification of the Lead Watershed Permittee for the watershed.
(b) An updated watershed map.

(c) Identification and description of all applicable water quality data, reports, analyses, and other information to be used to assess receiving water quality.
(d) Assessment and analysis of the watershed's water quality data, reports, analyses, and other information, including identification and prioritization of the watershed's water quality problems. Water quality problems and high priority water quality problems shall be identified.
(e) Identification of the likely sources, pollutant discharges, and/or other factors causing the high priority water quality problems within the watershed.
(f) A description of the program to be implemented to encourage collaborative, watershed-based, land-use planning.
(g) A description of the strategy to be used to guide Copermittee implementation of Watershed Water Quality Activities and Watershed Education Activities, including criteria for evaluating and identifying effective activities.
(h) A list of potential Watershed Water Quality Activities, including a description of each activity and its location(s).
(i) Identification and description of the Watershed Water Quality Activities to be implemented by each Copermittee for the first year of implementation, including justification for why the activities were chosen and a description of how the activities are expected to reduce discharged pollutant loads, abate pollutant sources, or result in other quantifiable benefits to discharge or receiving water quality, in relation to the watershed's high priority water quality problem(s). Plans for activity implementation beyond the first year of implementation should also be provided.
(j) A list of potential Watershed Education Activities.
(k) Identification and description of the Watershed Education Activities to be implemented by each Copermittee for the first year of implementation, including justification for why the activities were chosen and a description of how the activities are expected to directly target the sources and discharges of pollutants causing the watershed's high priority water quality problems. Plans for activity implementation beyond the first year of implementation should also be provided.
(l) A description of the public participation mechanisms to be used and the parties anticipated to be involved.
(m) A description of Copermittee collaboration to occur, including a schedule for WURMP meetings.
(n) A description of any TMDL BMP Implementation Plan or equivalent plan to be implemented under section H of this Order.[12]
(o) A detailed description of the effectiveness assessment to be conducted for the WURMP, including a description how each of the requirements in section I.2 of this Order will be met.

c. REGIONAL URBAN RUNOFF MANAGEMENT PLAN

(1) Copermittees - The written account of the regional program to be conducted is referred to as the Regional Urban Runoff Management Plan (RURMP). Each Copermittee shall collaborate with the other Copermittees to develop the RURMP. The RURMP shall describe all activities the Copermittees will undertake to implement the requirements of each component of Regional Urban

[12] For TMDLs not yet approved by the Office of Administrative Law at the time of adoption of this Order, TMDL BMP Implementation Plans shall be submitted separately 365 days following approval of the TMDL.

Runoff Management Program section F of this Order. At a minimum, the RURMP shall contain the following information:

(a) A common activities section that describes the urban runoff management activities to be implemented on a regional level. For regional activities which are to be implemented in compliance with any jurisdictional requirements of section D or watershed requirements of section E, it shall be described how the regional activities achieve compliance with the subject jurisdictional and/or watershed requirements.
(b) A description of steps that will be taken to facilitate assessment of the effectiveness of jurisdictional, watershed, and regional programs.
(c) A description of the regional residential education program to be implemented.
(d) A description of the strategy for development of the standardized fiscal analysis method required by section G of this Order.
(e) A detailed description of the effectiveness assessment to be conducted for the Regional Urban Runoff Management Program, including a description how each of the requirements in section I.3 of this Order will be met.

(2) The Principal Permittee shall be responsible for creating and submitting the RURMP. The Principal Permittee shall submit the RURMP to the Regional Board 365 days after adoption of this Order.

2. Other Required Reports and Plans

a. HYDROMODIFICATION MANAGEMENT PLAN

(1) Copermittees - Each Copermittee shall collaborate with the other Copermittees to develop the HMP. The HMP shall be submitted for approval by the Regional Board.

(2) Principal Permittee - The Principal Permittee shall be responsible for producing and submitting each document according to the schedule below.

(a) Within 180 days of adoption of the Order: Submit a detailed workplan and schedule for completion of the literature review, development of a protocol to identify an appropriate channel standard and limiting range of flow rates, development of guidance materials, and other required information;
(b) Within 18 months of adoption of the Order: Submit progress report on completion of requirements of the HMP;
(c) Within 2 years of adoption of the Order: Submit a draft HMP, including the analysis that identifies the appropriate limiting range of flow rates;
(d) Within 180 days of receiving comments from the Regional Board: Submit the HMP for Regional Board approval.

b. SUSMP UPDATES

Each Copermittee shall collaborate with the other Copermittees to update the Model SUSMP. The Principal Permittee shall be responsible for producing and submitting the updated Model SUSMP in accordance with the requirements of section D.1.d.(8)(b). Each Copermittee shall submit its updated local SUSMP, consistent

with the updated Model SUSMP, in accordance with the requirements of section D.1.d.(8)(c).

c. LONG-TERM EFFECTIVENESS ASSESSMENT

In accordance with section I.5 of this Order, the Principal Permittee shall submit the LTEA to the Regional Board no later than 210 days in advance of the expiration of this Order.

d. REPORT OF WASTE DISCHARGE

The Principal Permittee shall submit to the Regional Board, no later than 210 days in advance of the expiration date of this Order, a Report of Waste Discharge (ROWD) as an application for issuance of new waste discharge requirements. At a minimum, the ROWD shall include the following: (1) Proposed changes to the Copermittees' urban runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; and (6) Any other information necessary for the reissuance of this Order.

3. Annual Reports

a. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM ANNUAL REPORTS

Each Jurisdictional Urban Runoff Management Program Annual Report shall contain a comprehensive description of all activities conducted by the Copermittee to meet all requirements of section D. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted September 30, 2008 shall cover the reporting period July 1, 2007 to June 30, 2008.

(1) Copermittees – Each Copermittee shall generate individual Jurisdictional Urban Runoff Management Program Annual Reports which cover implementation of its jurisdictional activities during the past annual reporting period. Each Copermittee shall submit to the Principal Permittee its individual Jurisdictional Urban Runoff Management Program Annual Report by the date specified by the Principal Permittee. Each individual Jurisdictional Urban Runoff Management Program Annual Report shall be a comprehensive description of all activities conducted by the Copermittees to meet all requirements of each component of section D of this Order.

(2) Principal Permittee – The Principal Permittee shall submit Unified Jurisdictional Urban Runoff Management Program Annual Reports to the Regional Board by September 30 of each year, beginning on September 30, 2008. The Unified Jurisdictional Urban Runoff Management Program Annual Report shall contain the twenty-one individual Jurisdictional Urban Runoff Management Program Annual Reports.

The Principal Permittee shall also be responsible for collecting and assembling each Copermittees' individual Jurisdictional Urban Runoff Management Program Annual Report.

(3) At a minimum, each Jurisdictional Urban Runoff Management Program Annual Report shall contain the following information:

(a) Development Planning

i. A description of any amendments to the General Plan, the environmental review process, development project approval processes, or development project requirements.

ii. Confirmation that all development projects were required to undergo the Copermittee's urban runoff approval process and meet the applicable project requirements, including a description of how this information was tracked.

iii. A listing of the development projects to which SUSMP requirements were applied.

iv. Confirmation that all applicable SUSMP BMP requirements were applied to all priority development projects, including a description of how this information was tracked.

v. At least one example of a priority development project that was conditioned to meet SUSMP requirements and a description of the required BMPs.

vi. A listing of the priority development projects which were allowed to implement treatment control BMPs with low removal efficiency rankings, including the feasibility analyses which were conducted to exhibit that more effective BMPs were infeasible.

vii. An updated treatment control BMP inventory.

viii. The number of treatment control BMPs inspected, including a summary of inspection results and findings.

ix. A description of the annual verification of operation and maintenance of treatment control BMPs, including a summary of verification results and findings.

x. Confirmation that BMP verification was conducted for all priority development projects prior to occupancy, including a description of how this information was tracked.

xi. A listing of any projects which received a SUSMP waiver.

xii. A description of implementation of any SUSMP waiver mitigation program.

xiii. A description of Hydromodification Management Plan (HMP) development collaboration and participation.

xiv. A listing of development projects required to meet HMP requirements, including a description of hydrologic control measures implemented.

xv. A listing of priority development projects not required to meet HMP requirements, including a description of why the projects were found to be exempt from the requirements.

xvi. A listing of development projects disturbing 50 acres or more, including information on whether Interim Hydromodification Criteria were met by each of the projects, together with a description of hydrologic control measures implemented for each applicable project.

xvii. The number of violations and enforcement actions (including types) taken for development projects, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.

xviii. A description of notable activities conducted to manage urban runoff from development projects.

(b) Construction

i. Confirmation that all construction sites were required to undergo the Copermittee's construction urban runoff approval process and meet the applicable construction requirements, including a description of how this information was tracked.
ii. Confirmation that a regularly updated construction site inventory was maintained, including a description of how the inventory was managed.
iii. A description of modifications made to the construction and grading ordinances and approval processes.
iv. Confirmation that the designated BMPs were implemented, or required to be implemented, for all construction sites.
v. Confirmation that a maximum disturbed area for grading was applied to all applicable construction sites.
vi. A listing of all construction sites with conditions requiring advanced treatment, together with confirmation that advanced treatment was required at such construction sites.
vii. For each construction site within each priority category (high, medium, and low), identification of the period of time (weeks) the site was active within the rainy season, the number of inspections conducted during the rainy season, and the number of inspections conducted during the dry season, and the total number of inspections conducted for all sites.
viii. A description of the general results of the inspections.
ix. Confirmation that the inspections conducted addressed all the required inspection steps to determine full compliance.
x. The number of violations and enforcement actions (including types) taken for construction sites, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
xi. A description of notable activities conducted to manage urban runoff from construction sites.

(c) Municipal

i. Any updates to the municipal inventory and prioritization.
ii. Confirmation that the designated BMPs were implemented, or required to be implemented, for municipal areas and activities, as well as special events.
iii. A description of inspections and maintenance conducted for municipal treatment controls.
iv. Identification of the total number of catch basins and inlets, the number of catch basins and inlets inspected, the number of catch basins and inlets found with accumulated waste exceeding cleaning criteria, and the number of catch basins and inlets cleaned.
v. Identification of the total distance (miles) of the MS4, the distance of the MS4 inspected, the distance of the MS4 found with accumulated waste exceeding cleaning criteria, and the distance of the MS4 cleaned.
vi. Identification of the total distance (miles) of open channels, the distance of open channels inspected, the distance of open channels found with anthropogenic litter, and the distance of open channels cleaned.

vii. Amount of waste and litter (tons) removed from catch basins, inlets, the MS4, and open channels, by category.
viii. Identification of any MS4 facility found to require inspection less than annually following two years of inspection, including justification for the finding.
ix. Confirmation that the designated BMPs for pesticides, herbicides, and fertilizers were implemented, or required to be implemented, for municipal areas and activities.
x. Identification of the total distance of curb-miles of improved roads, streets, and highways identified as consistently generating the highest volumes of trash and/or debris, as well as the frequency of sweeping conducted for such roads, streets, and highways.
xi. Identification of the total distance of curb-miles of improved roads, streets, and highways identified as consistently generating moderate volumes of trash and/or debris, as well as the frequency of sweeping conducted for such roads, streets, and highways.
xii. Identification of the total distance of curb-miles of improved roads, streets, and highways identified as consistently generating low volumes of trash and/or debris, as well as the frequency of sweeping conducted for such roads, streets, and highways.
xiii. Identification of the total distance of curb-miles swept.
xiv. Identification of the number of municipal parking lots, the number of municipal parking lots swept, and the frequency of sweeping.
xv. Amount of material (tons) collected from street and parking lot sweeping.
xvi. A description of efforts implemented to prevent and eliminate infiltration from the sanitary sewer to the MS4
xvii. Identification of the number of sites requiring inspections, the number of sites inspected, and the frequency of the inspections.
xviii. A description of the general results of the inspections.
xix. Confirmation that the inspections conducted addressed all the required inspection steps to determine full compliance.
xx. The number of violations and enforcement actions (including types) taken for municipal areas and activities, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
xxi. A description of notable activities conducted to manage urban runoff from municipal areas and activities.

(d) Industrial and Commercial
i. Any updates to the industrial and commercial inventory.
ii. Confirmation that the designated BMPs were implemented, or required to be implemented, for industrial and commercial sites/sources.
iii. A description of efforts taken to notify owners/operators of industrial and commercial sites/sources of BMP requirements, including mobile businesses.
iv. Identification of the total number of industrial and commercial sites/sources inventoried and the total number inspected.
v. Justification and rationale for why the industrial and commercial sites/sources inspected were chosen for inspection.

vi. Confirmation that all inspections conducted addressed all the required inspection steps to determine full compliance.
vii. Identification of the number of third party inspections conducted.
viii. Identification of efforts conducted to verify third party inspection effectiveness.
ix. A description of efforts implemented to address mobile businesses.
x. The number of violations and enforcement actions (including types) taken for industrial and commercial sites/sources, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
xi. A description of steps taken to identify non-filers and a list of non-filers (under the General Industrial Permit) identified by the Copermittees.
xii. A description of notable activities conducted to manage urban runoff from industrial and commercial sites/sources.

(e) Residential
i. Identification of the high threat to water quality residential areas and activities that were focused on.
ii. Confirmation that the designated BMPs were implemented, or required to be implemented, for residential areas and activities.
iii. A description of efforts implemented to facilitate proper management and disposal of used oil and other household hazardous materials.
iv. Types and amounts of household hazardous wastes collected, if applicable.
v. A description of any evaluation of methods used for oversight of residential areas and activities, as well as any findings of the evaluation.
vi. The number of violations and enforcement actions (including types) taken for residential areas and activities, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
vii. A description of collaboration efforts taken to develop and implement the Regional Residential Education Program.
viii. A description of notable activities conducted to manage urban runoff from residential areas and activities.

(f) Illicit Discharge Detection and Elimination
i. Correction of any inaccuracies in either the MS4 map or the Dry Weather Field Screening and Analytical Stations Map.
ii. Reporting of all dry weather field screening and analytical monitoring results. The data should be presented in tabular and graphical form. The reporting shall include station locations, all dry weather field screening and analytical monitoring results, identification of sites where results exceeded action levels, follow-up and elimination activities for potential illicit discharges and connections, the rationale for why follow-up investigations were not conducted at sites where action levels were exceeded, any Copermittee or consultant program recommendations/changes resulting from the monitoring, and documentation that these recommendations/changes have been implemented. Dry weather field screening and analytical monitoring reporting shall comply with all monitoring and standard reporting

requirements in Attachment B of Order No. R9-2007-0001 and Receiving Waters Monitoring and Reporting Program No. R9-2007-0001.

iii. Any dry weather field screening and analytical monitoring consultant reports generated, to be provided as an attachment to the annual report.
iv. A brief description of any other investigations and follow-up activities for illicit discharges and connections.
v. The number and brief description of illicit discharges and connections identified.
vi. The number of illicit discharges and connections eliminated.
vii. Identification and description of all spills to the MS4 and response to the spills.
viii. A description of activities implemented to prevent sewage and other spills from entering the MS4.
ix. A description of the mechanism whereby notification of sewage spills from private laterals and septic systems is received.
x. Number of times the hotline was called, as compared to previous reporting periods, and a summary of the calls.
xi. A description of efforts to publicize and facilitate public reporting of illicit discharges.
xii. The number of violations and enforcement actions (including types) taken for illicit discharges and connections, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
xiii. A description of notable activities conducted to manage illicit discharges and connections.

(g) Education
i. A description of education efforts conducted for each target community.
ii. A description of how education efforts targeted underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges.
iii. A description of education efforts conducted for municipal departments and personnel.
iv. A description of education efforts conducted for the new development and construction communities.
v. A description of jurisdictional education efforts conducted for residents, the general public, and school children.

(h) Public Participation
i. A description of public participation efforts conducted.

(i) Program Effectiveness Assessment
i. An assessment of the effectiveness of the Jurisdictional Urban Runoff Management Program which meets all requirements of section I.1 of this Order.

(j) Fiscal Analysis
i. A fiscal analysis of the Copermittee's urban runoff management programs which meets all requirements of section G of this Order.

(k) Special Investigations
i. A description of any special investigations conducted.

(l) Non-Emergency Fire Fighting
i. A description of any efforts conducted to reduce pollutant discharges from non-emergency fire fighting flows.

(m) JURMP Revisions
i. A description of any proposed revisions to the JURMP.

b. WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM ANNUAL REPORTS

(1) Lead Watershed Permittee - Each Lead Watershed Permittee shall generate watershed specific Watershed Urban Runoff Management Program Annual Reports for their respective watershed(s), as they are outlined in Table 4 of Order No. R9-2007-0001. Copermittees within each watershed shall collaborate with the Lead Watershed Permittee to generate the Watershed Urban Runoff Management Program Annual Reports.

(2) Each Watershed Urban Runoff Management Program Annual Report shall be a comprehensive documentation of all activities conducted by the watershed Copermittees during the previous annual reporting period to meet all requirements of section E of Order No. R9-2007-0001. Each Watershed Urban Runoff Management Program Annual Report shall also serve as an update to the WURMP.[13] Each Watershed Urban Runoff Management Program Annual Report shall, at a minimum, contain the following for its reporting period:

(a) A comprehensive description of all activities conducted by the watershed Copermittees to meet all requirements of section E of Order No. R9-2007-0001.

(b) Any updates to the watershed map.

(c) An updated assessment and analysis of the watershed's current and past applicable water quality data, reports, analyses, and other information, including identification of the watershed's water quality problems and high priority water quality problem(s) during the reporting period. The annual report shall clearly state if the watershed's high priority water quality problem(s) changed from the previous reporting period, and provide justification for the change(s).

(d) Identification of the likely sources, pollutant discharges, and/or other factors causing the high priority water quality problems within the watershed. The annual report shall clearly describe any changes to the identified sources, pollutant discharges, and/or other factors that have occurred since the previous reporting period, and provide justification for the changes.

[13] The first annual report to be submitted is not anticipated to be an update to the WURMP, since it will cover the reporting period which begins immediately after WURMP submittal.

(e) An updated list of potential Watershed Water Quality Activities. The annual report shall clearly describe any changes to the list of Watershed Water Quality Activities that have occurred since the previous reporting period, and provide justification for the changes.

(f) Identification and description of the Watershed Water Quality Activities implemented by each Copermittee during the reporting period, including information on the activities' location(s), as well as information exhibiting that the activities in active implementation phase reduced discharged pollutant loads, abated pollutant sources, or resulted in other quantifiable benefits to discharge or receiving water quality, in relation to the watershed's high priority water quality problem(s). The annual report shall clearly describe any changes to Watershed Water Quality Activities implementation that have occurred since the previous reporting period, and provide justification for the changes.

(g) An updated list of potential Watershed Education Activities. The annual report shall clearly describe any changes to the list of Watershed Education Activities that have occurred since the previous reporting period, and provide justification for the changes.

(h) Identification and description of the Watershed Education Activities implemented by each Copermittee for the reporting period, including information exhibiting that the activities directly targeted the sources and discharges of pollutants causing the watershed's high priority water quality problems, and that activities in active implementation phase changed target audience attitudes, knowledge, awareness, or behavior. The annual report shall clearly describe any changes to Watershed Education Activities implementation that have occurred since the previous reporting period, and provide justification for the changes.

(i) A description of the public participation mechanisms used during the reporting period and the parties that were involved.

(j) A description of Copermittee collaboration efforts.

(k) A description of efforts implemented to encourage collaborative, watershed-based, land-use planning.

(l) A description of all TMDL activities implemented (including BMP Implementation Plan or equivalent plan activities) for each approved TMDL in the watershed. The description shall include:

i. Any additional source identification information;
ii. The number, type, location, and other relevant information about BMP implementation, including any expanded or better tailored BMPs necessary to meet the WLAs;
iii. Updates in the BMP implementation prioritization and schedule;
iv. An assessment of the effectiveness of the BMP Implementation Plan, which meets the requirements of section I.4 Order No. R9-2007-0001; and

v. A discussion of the progress to date in meeting the TMDL Numeric Targets and WLAs, which incorporates the results of the effectiveness assessment, compliance monitoring, and an evaluation of additional efforts needed to date.

(m) An assessment of the effectiveness of the WURMP, which meets the requirements of section I.2 of Order No. R9-2007-0001. The effectiveness assessment shall attempt to qualitatively or quantitatively exhibit the impact that implementation of the Watershed Water Quality Activities and the Watershed Education Activities had on the high priority water quality problem(s) within the watershed. This information shall document changes in pollutant load discharges, urban runoff and discharge quality, and receiving water quality, where applicable and feasible.

(3) Principal Permittee – The Unified Watershed Urban Runoff Management Program Annual Report shall contain the nine separate Watershed Urban Runoff Management Program Annual Reports. Each Lead Watershed Copermittee shall submit to the Principal Permittee a Watershed Urban Runoff Management Program Annual Report by the date specified by the Principal Permittee. The Principal Permittee shall assemble and submit the Unified Watershed Urban Runoff Management Program Annual Report to the Regional Board by January 31, 2009 and every January 31 thereafter. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2009 shall cover the reporting period July 1, 2007 to June 30, 2008.

c. REGIONAL URBAN RUNOFF MANAGEMENT PROGRAM ANNUAL REPORTS

The Principal Permittee shall generate the Regional Urban Runoff Management Program Annual Reports. All Copermittees shall collaborate with the Principal Permittee to generate the Regional Urban Runoff Management Program Annual Reports. Each Regional Urban Runoff Management Program Annual Report shall be a comprehensive documentation of all regional activities conducted by the Copermittees during the previous annual reporting period to meet all requirements of section F of Order No. R9-2007-0001.

The Principal Permittee shall submit the Regional Urban Runoff Management Program Annual Report to the Regional Board by January 31, 2009 and every January 31 thereafter. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2009 shall cover the reporting period July 1, 2007 to June 30, 2008.

Each Regional Urban Runoff Management Program Annual Report shall, at a minimum, contain the following:

(1) A common activities section that describes the urban runoff management activities or BMPs implemented on a regional level, including information on how the activities complied with jurisdictional or watershed requirements, if applicable.
(2) A description of steps taken to facilitate assessment of the effectiveness of jurisdictional, watershed, and regional programs.

(3) A description of the regional residential education activities implemented as part of the regional residential education program.
(4) A description of steps taken to develop and implement the standardized fiscal analysis method.
(5) An assessment of the effectiveness of the Regional Urban Runoff Management Program which meets the requirements of section I.3 of Order No. R9-2007-0001.

4. Interim Reporting Requirements - For the July 2006–June 2007 reporting period, Jurisdictional URMP and Watershed URMP Annual Reports shall be submitted on January 31, 2008. Each Jurisdictional URMP and Watershed URMP Annual Report submitted for this reporting period shall at a minimum be comprehensive descriptions of all activities conducted to fully implement the Copermittees' Jurisdictional URMP and Watershed URMP documents, as those documents were developed to comply with the requirements of Order No. 2001-01. The Principal Permittee shall be responsible for submitting these documents in a unified manner, consistent with the unified reporting requirements of Order No. 2001-01.

5. Annual Report Integration

a. The Copermittees are encouraged to submit, for Regional Board review and approval, an annual reporting format which integrates the information submitted in the JURMP, WURMP, and RURMP Annual Reports and Monitoring Reports. This document shall be called the "Integrated Annual Report Format." The Integrated Annual Report Format should:

(1) Exhibit compliance with all requirements of JURMP, WURMP, and RURMP sections D, E, and F of Order No. R9-2007-0001.
(2) Report all information required in section J.3 of Order No. R9-2007-0001.
(3) Report all information required in the Monitoring and Reporting program.
(4) Provide consistent and comparable reporting of jurisdictional and watershed information by all Copermittees and watershed groups.
(5) Specifically identify all types of information that will be reported (e.g., amount of debris collected during street sweeping), including reporting criteria for each type of information (e.g., reported in tons).
(6) Describe quality assurance/quality control methods to be used to assess accuracy of jurisdictional and watershed information conveyed.
(7) Describe each Copermittee's reporting responsibilities under the format.
(8) Improve the Copermittees' ability to assess JURMP and WURMP effectiveness in terms of water quality.
(9) Include a separate section for reporting on each Copermittee's activities.
(10) Include a separate section for reporting on each watershed's activities.

b. Upon approval of the Integrated Annual Report Format by the Regional Board, an Integrated Annual Report shall be submitted annually, which may substitute for the JURMP Annual Reports, WURMP Annual Reports, RURMP Annual Report, and/or Monitoring Reports, as approved by the Regional Board. The Principal Permittee shall be responsible for the generation and submittal of the Integrated Annual Reports. Each Copermittee shall be responsible for the information in the Integrated Annual Report pertaining to its jurisdictional, watershed, regional, and monitoring responsibilities. The Integrated Annual Report shall be submitted the first January 31 following approval of the reporting format by the Regional Board, and every January

31 thereafter. The reporting period for Integrated Annual Reports shall be the previous fiscal year. For example, a report submitted January 31, 2010 shall cover the reporting period July 1, 2008 to June 30, 2009.

c. The format and information provided in Integrated Annual Reports shall match and be consistent with the format and information described in the Integrated Annual Report Format.

6. Universal Reporting Requirements

All submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit a signed certified statement covering its responsibilities for each applicable submittal. The Principal Permittee shall submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

K. MODIFICATION OF PROGRAMS

Modifications of Jurisdictional Urban Runoff Management Programs, Watershed Urban Runoff Management Programs, and/or the Regional Urban Runoff Management Program may be initiated by the Executive Officer or by the Copermittees. Requests by Copermittees shall be made to the Executive Officer, and shall be submitted during the annual review process. Requests for modifications should be incorporated, as appropriate, into the Annual Reports or other deliverables required or allowed under this Order.

1. Minor Modifications – Minor modifications to Jurisdictional Urban Runoff Management Programs, Watershed Urban Runoff Management Programs, and/or the Regional Urban Runoff Management Program may be accepted by the Executive Officer where the Executive Officer finds the proposed modification complies with all discharge prohibitions, receiving water limitations, and other requirements of this Order.

2. Modifications Requiring an Amendment to this Order – Proposed modifications that are not minor shall require amendment of this Order in accordance with this Order's rules, policies, and procedures.

L. ALL COPERMITTEE COLLABORATION

1. Each Copermittee collaborate with all other Copermittees regulated under this Order to address common issues, promote consistency among Jurisdictional Urban Runoff Management Programs and Watershed Urban Runoff Management Programs, and to plan and coordinate activities required under this Order.

   a. Management Structure - All Copermittees shall jointly execute and submit to the Regional Board no later than 180 days after adoption of this Order, a Memorandum of Understanding, Joint Powers Authority, or other instrument of formal agreement which at a minimum:

      (1) Identifies and defines the responsibilities of the Principal Permittee and Lead Watershed Permittees;
      (2) Identifies Copermittees and defines their individual and joint responsibilities, including watershed responsibilities;

(3) Establishes a management structure to promote consistency and develop and implement regional activities;
(4) Establishes standards for conducting meetings, decision-making, and cost-sharing;
(5) Provides guidelines for committee and workgroup structure and responsibilities;
(6) Lays out a process for addressing Copermittee non-compliance with the formal agreement; and
(7) Includes any and all other collaborative arrangements for compliance with this Order.

M. PRINCIPAL PERMITTEE RESPONSIBILITIES

Within 180 days of adoption of this Order, the Copermittees shall designate the Principal Permittee and notify the Regional Board of the name of the Principal Permittee. The Principal Permittee shall, at a minimum:

1. Serve as liaison between the Copermittees and the Regional Board on general permit issues, and when necessary and appropriate, represent the Copermittees before the Regional Board.

2. Coordinate permit activities among the Copermittees and facilitate collaboration on the development and implementation of programs required under this Order.

3. Integrate individual Copermittee documents and reports into single unified documents and reports for submittal to the Regional Board as required under this Order.

4. Produce and submit documents and reports as required by section J of this Order and Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

5. Submit to the Regional Board, within 180 days of adoption of this Order, a formal agreement between the Copermittees which provides a management structure for meeting the requirements of this Order (as described in section L).

6. Coordinate joint development by all of the Copermittees of standardized format(s) for all documents and reports required under this Order (e.g., JURMPs, WURMPs, annual reports, monitoring reports, etc.). The standardized reporting format(s) shall be used by all Copermittees. The Principal Permittee shall submit the standardized format(s) to the Regional Board for review no later than 180 days after adoption of this Order.

N. RECEIVING WATERS MONITORING AND REPORTING PROGRAM

Pursuant to CWC section 13267, the Copermittees shall comply with all the requirements contained in Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

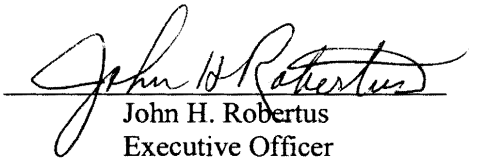
O. STANDARD PROVISIONS, REPORTING REQUIREMENTS, AND NOTIFICATIONS

1. Each Copermittee shall comply with Standard Provisions, Reporting Requirements, and Notifications contained in Attachment B of this Order. This includes 24 hour/5day reporting requirements for any instance of non-compliance with this Order as described

in section 5.e of Attachment B.

2. All plans, reports and subsequent amendments submitted in compliance with this Order shall be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on January 24, 2007.



John H. Robertus
Executive Officer

ATTACHMENT A

BASIN PLAN PROHIBITIONS

California Water Code Section 13243 provides that a Regional Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste, or certain types of waste is not permitted. The following discharge prohibitions are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a NPDES permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this Regional Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the Regional Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from

fire fighting activities. [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the Regional Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

ATTACHMENT B

STANDARD PROVISIONS, REPORTING REQUIREMENTS, AND NOTIFICATIONS

1. STANDARD PROVISIONS – PERMIT COMPLIANCE [40 CFR 122.41]

(a) *Duty to comply* [40 CFR 122.41(a)].

(1) The Copermittee must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(2) The Copermittee shall comply with effluent standards or prohibitions established under section 307(a) of the CWA toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the Order has not yet been modified to incorporate the requirement.

(b) *Need to halt or reduce activity not a defense* [40 CFR 122.41(c)]. It shall not be a defense for the Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order.

(c) *Duty to mitigate* [40 CFR 122.41(d)]. The Copermittee shall take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment.

(d) *Proper operation and maintenance* [40 CFR 122.41(e)]. The Copermittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Copermittee only when necessary to achieve compliance with the conditions of this Order.

(e) *Property rights* [40 CFR 122.41(g)].

(1) This Order does not convey any property rights of any sort or any exclusive privilege.
(2) The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

(f) *Inspection and entry* [40 CFR 122.41(i)]. The Copermittee shall allow the Regional Water Quality Control Board, San Diego Region (Regional Board), State Water Resources Control Board (SWRCB), United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;
(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;
(3) Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
(4) Sample or monitor, at reasonable times, for the purpose of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location.

(g) *Bypass* [40 CFR 122.41(m)]

(1) Definitions:

i) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
ii) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(2) Bypass not exceeding limitations - The Copermittee may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance (g)(3), (g)(4) and (g)(5) below.

(3) Prohibition of Bypass - Bypass is prohibited, and the Regional Board may take enforcement action against a Copermittee for bypass, unless:

i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
iii) The Copermittee submitted notice as required under Standard Provisions – Permit Compliance (g)(3) above.

(4) Notice

i) Anticipated bypass. If the Copermittee knows in advance of the need for a bypass, it shall submit a notice, if possible at least ten days before the date of the bypass.
ii) Unanticipated bypass. The Copermittee shall submit notice of an unanticipated bypass as required in Standard Provisions 5(e) below (24-hour notice).

(h) *Upset* [40 CFR 122.41(n)] Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance (h)(2) below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(2) Conditions necessary for a demonstration of upset. A Copermittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

i) An upset occurred and that the Copermittee can identify the cause(s) of the upset;
ii) The permitted facility was at the time being properly operated;
iii) The Copermittee submitted notice of the upset as required in Standard Provisions – Permit Compliance (5)(e)(ii)(B) below (24-hour notice); and
iv) The Copermittee complied with any remedial measures required under Standard Provisions – Permit Compliance 1(c) above.

(3) Burden of Proof. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof.

2. STANDARD PROVISIONS – PERMIT ACTION

(a) *General* [40 CFR 122.41(f)] This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition.

(b) *Duty to reapply* [40 CFR 122.41(b)]. If the Copermittee wishes to continue an activity regulated by this Order after the expiration date of this Order, the Copermittee must apply for and obtain new permit.

(c) *Transfers*. This Order is not transferable to any person except after notice to the Regional Board. The Regional Board may require modification or revocation and reissuance of the Order to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA and the CWC.

3. STANDARD PROVISIONS – MONITORING

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. [40 CFR Section 122.41 (j) (1)]

(b) Monitoring results must be conducted according to test procedures under 40 CFR Part 136, or in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise

specified in 40 CFR Part 503 unless other test procedures have been specified in this Order [40 CFR Section 122.41(j)(4)][40 CFR Section 122.44(i)(1)(iv)].

4. STANDARD PROVISIONS – RECORDS

(a) Except for records of monitoring information required by this Order related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Copermittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application, This period may be extended by request of the Regional Water Board Executive Officer at any rime [40 CFR Section 122.41(j)(2)].

(b) *Records of monitoring information* [40 CFR 122.41(j) (3)] shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

(c) *Claims of confidentiality* [40 CFR Section 122.7(b)] of the following information will be denied:

(1) The name and address of any permit applicant or Copermittee; and
(2) Permit applications and attachments, permits and effluent data.

5. STANDARD PROVISIONS – REPORTING

(a) *Duty to provide information* [40 CFR 122.41(h)]. The Copermittee shall furnish to the Regional Board, SWRCB, or USEPA within a reasonable time, any information which the Regional Board, SWRCB, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Copermittee shall also furnish to the Regional Board, SWRCB, or USEPA, copies of records required to be kept by this Order.

(b) *Signatory and Certification Requirements* [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the Regional Board, SWRCB, or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting 5(b)ii), 5(b)iii), 5(b)iv), and 5(b) (see 40 CFR 122.22)

(2) *Applications* [40 CFR 122.22(a)(3)] All permit applications shall be signed by either a principal executive officer or ranking elected official.

(3) *Reports* [40 CFR 122.22(b)]. All reports required by this Order, and other information requested by the Regional Board, SWRCB, or USEPA shall be signed by a person described in Standard Provisions – Reporting 5(b)(2) above, or by a duly authorized

representative of that person. A person is a duly authorized representative only if:

i) The authorization is made in writing by a person described in Standard Provisions-Reporting 5(b)(2) above;

ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and,

iii) The written authorization is submitted to the Regional Water Board and State Water Board.

(4) *Changes to authorization* [40 CFR Section 122.22(c)] If an authorization under Standard Provisions – Reporting 5(b)(3)of this reporting requirement is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting 5(b)(3) above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative.

(5) *Certification* [40 CFR Section 122.22(d)] Any person signing a document under Standard Provisions – Reporting 5(b)(2), or 5(b)(3) above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(c) *Monitoring reports*. [40 CFR 122.41(l)(4)]

(1) Monitoring results shall be reported at the intervals specified in the Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

(2) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Board or SWRCB for reporting results of mentoring of sludge use or disposal practices.

(3) If the Copermittee monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Board.

(4) Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order.

(d) *Compliance schedules*. [40 CFR Section 122.41(l)(5)] Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order shall be submitted no later than 14 days following each schedule date.

(e) *Twenty-four hour reporting* [40 CFR Section 122.41(l)(6)]

(1) The Copermittee shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information, which must be reported within 24 hours under this paragraph:

i) Any unanticipated bypass that exceeds any effluent limitation in the Order (See 40 CFR 122.41(g)).
ii) Any upset which exceeds any effluent limitation in this Order.

(3) The Regional Board may waive the above-required written report under this provision on a case-by-case basis if the oral report has been received within 24 hours.

(f) *Planned changes*. [40 CFR Section 122.41(l)(1)] The Copermittee shall give notice to the Regional Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants, which are not subject to effluent limitations in this Order.

(3) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing Order, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(g) *Anticipated noncompliance*. [40 CFR Section 122.41(l)(7)] The Copermittee shall give advance notice to the Regional Board or SWRCB of any planned changes in the permitted facility or activity, which may result in noncompliance with Order requirements.

(h) *Other noncompliance* [40 CFR Section 122.41(l) 7)] The Copermittee shall report all instances of noncompliance not reported under Standard Provisions 5(c), 5(d), and 5(e) above, at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting 5(e) above.

(i) *Other information* [40 CFR Section 122.41(l)(8)] When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Board, SWRCB, or USEPA, the Copermittee shall promptly submit such facts or information.

6. STANDARD PROVISIONS – ENFORCEMENT

(a) The Regional Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, Sections 13385, 13386, and 13387.

7. ADDITIONAL STANDARD PROVISIONS

(a) *Municipal separate storm sewer systems* [40 CFR 122.42(c)]. The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions;

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes shall be consistent with 40 CFR 122.26(d)(2)(iii); and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and 40 CFR 122.26(d)(2)(v);

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year;

(5) Annual expenditures and budget for year following each annual report;

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and

(7) Identification of water quality improvements or degradation.

(b) *Storm water discharges* [40 CFR 122.42(d)]. The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) shall require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

(c) *Other Effluent Limitations and Standards* [40 CFR 122.44(b)(1)]. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this Order, the Regional Board may institute

proceedings under these regulations to modify or revoke and reissue the Order to conform to the toxic effluent standard or prohibition.

(d) *Discharge is a privilege* [CWC section 13263(g)]. No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights.

(e) *Review and revision of Order* [CWC section 13263(e)]. Upon application by any affected person, or on its own motion, the Regional Board may review and revise this permit.

(f) *Termination or modification of Order* [CWC section13381]. This permit may be terminated or modified for causes, including, but not limited to, all of the following:

(1) Violation of any condition contained in this Order;
(2) Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts.
(3) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

(g) *Transfers*. When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

(h) *Conditions not stayed*. The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order.

(i) *Availability*. A copy of this Order shall be kept at a readily accessible location and shall be available to on-site personnel at all times.

(j) *Duty to minimize or correct adverse impacts*. The Copermittees shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

(k) *Interim Effluent Limitations.* The Copermittee shall comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by this Regional Board.

(l) *Responsibilities, liabilities, legal action, penalties* [CWC sections 13385 and 13387]. The Porter-Cologne Water Quality Control Act provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

Except as provided for in 40CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

(m) *Noncompliance*. Any noncompliance with this Order constitutes violation of the CWC and is grounds for denial of an application for modification of the Order (also see 40 CFR 122.41(a).

(n) *Director*. For purposes of this Order, the term "Director" used in parts of 40 CFR incorporated into this Order by reference and/or applicable to this Order shall have the same meaning as the term "Regional Board" used elsewhere in this Order, except that in 40 CFR 122.41(h) and (I), "Director" shall mean "Regional Board, SWRCB, and USEPA."

(o) The Regional Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The Regional Board or SWRCB may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to a MS4. Copermittees may prohibit any non-storm water discharge (or class of non-storm water discharges) to a MS4 that is authorized under such separate NPDES permits.

(p) *Effective date*. This Order shall become effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. 2001-01 upon the effective date of this Order.

(q) *Expiration*. This Order expires five years after adoption.

(r) *Continuation of expired order* [23 CCR 2235.4]. After this Order expires, the terms and conditions of this Order are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

(s) *Applications*. Any application submitted by a Copermittee for reissuance or modification of this Order shall satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

(t) *Confidentiality*. Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the Regional Board office.

(u) *Severability*. The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

(v) *Report submittal*. The Copermittee shall submit reports and provide notifications as required by this Order to the following:

SOUTHERN WATERSHED PROTECTION UNIT
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

Unless otherwise directed, the Copermittee shall submit one hard copy for the official record and one electronic copy of each report required under this Order to the Regional Board and one electronic copy to the EPA.

ATTACHMENT C

DEFINITIONS

Advanced Treatment- Using mechanical or chemical means to flocculate and remove suspended sediment from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Basin Plan – Water Quality Control Plan, San Diego Basin, Region 9, and amendments, developed by the Regional Board.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 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. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs are typically used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biological integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use…(that)…describe the characteristics of water body segments least impaired by human activities."

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. Environmental Management 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

Clean Water Act Section 402(p) [33 USC 1342(p)] - The federal statute requiring municipal and industrial dischargers to obtain NPDES permits for their discharges of storm water.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of urban runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

CWA – Federal Clean Water Act

CWC – California Water Code

Development Projects - New development or redevelopment with land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces, public agency projects, and land subdivision.

Dry Season – May 1 through September 30 of each year.

Effectiveness Assessment Outcome Level 1 - Compliance with Activity-based Permit Requirements – Level 1 outcomes are those directly related to the implementation of specific activities prescribed by this Order or established pursuant to it.

Effectiveness Assessment Outcome Level 2 - Changes in Attitudes, Knowledge, and Awareness – Level 2 outcomes are measured as increases in knowledge and awareness among target audiences such as residents, businesses, and municipal employees.

Effectiveness Assessment Outcome Level 3 - Behavioral Change and BMP Implementation – Level 3 outcomes measure the effectiveness of activities in affecting behavioral change and BMP implementation.

Effectiveness Assessment Outcome Level 4 - Load Reductions – Level 4 outcomes measure load reductions which quantify changes in the amounts of pollutants associated with specific sources before and after a BMP or other control measure is employed.

Effectiveness Assessment Outcome Level 5 - Changes in Urban Runoff and Discharge Quality – Level 5 outcomes are measured as changes in one or more specific constituents or stressors in discharges into or from MS4s.

Effectiveness Assessment Outcome Level 6 - Changes in Receiving Water Quality – Level 6 outcomes measure changes to receiving water quality resulting from discharges into and from MS4s, and may be expressed through a variety of means such as compliance with water quality objectives or other regulatory benchmarks, protection of biological integrity, or beneficial use attainment.

Effluent Limitations – Any restriction imposed on quantities, discharge rates, and concentrations of pollutants, which are discharged from point sources into waters of the State. The limitations are designed to ensure that the discharge does not cause water quality objectives to be exceeded in the receiving water and does not adversely affect beneficial uses. Effluent limits are typically numeric (e.g., 10 mg/l), but can also be narrative (e.g., no toxics in toxic amounts).

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Feasibility Analysis – Detailed description of the selection process for the treatment control BMPs for a Priority Development Project, including justification of why one BMP is selected over another. For a Priority Development Project where a treatment control BMP with a low removal efficiency ranking (as identified by the Model SUSMP) is proposed, the analysis shall include a detailed and adequate justification exhibiting the reasons implementation of a treatment control BMP with a higher removal efficiency is infeasible for the Priority Development Project or portion of the Priority Development Project.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-project flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-project condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

GIS – Geographic Information System

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Implementation Assessment – Assessment conducted to determine the effectiveness of Copermittee programs and activities in achieving measurable targeted outcomes, and in determining whether priority sources of water quality problems are being effectively addressed.

Inactive Slopes – Slopes on which no grading or other soil disturbing activities are conducted for 10 or more days.

Integrated Assessment – Assessment to be conducted to evaluate whether program implementation is properly targeted to and resulting in the protection and improvement of water quality.

Jurisdictional Urban Runoff Management Plan (JURMP) – A written description of the specific jurisdictional urban runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that pollutant discharges in urban runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – 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.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their urban runoff management programs. Their total collective and individual activities conducted pursuant to the urban runoff management programs becomes their

proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the Regional Board, the Regional Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (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. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP base solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to

waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

NOI – Notice of Intent

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges, non-prohibited discharges, and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Order – Order No. R9-2007-0001 (NPDES No. CAS0108758)

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act: "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollutants of Concern – Pollutants for which water bodies are listed as impaired under CWA section 303(d), pollutants associated with the land use type of a development, and/or pollutants commonly associated with urban runoff. Pollutants commonly associated with urban runoff include total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (decaying vegetation, animal waste, and anthropogenic litter).

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Post-Construction BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, or educate to prevent the release of pollutants to surface waters during the final functional life of developments.

Pre-Project or Pre-Development Runoff Conditions (Discharge Rates, Durations, Etc.) – Runoff conditions that exist onsite immediately before the planned development activities occur. This definition is not intended to be interpreted as that period before any human-induces land activities occurred. This definition pertains to redevelopment as well as initial development.

Principal Permittee – County of San Diego

Priority Development Projects - New development and redevelopment project categories listed in Section D.1.d(2) of Order No. R9-2007-0001.

Receiving Waters – Waters of the U.S.

Receiving Water Limitations (RWLs) - Waste discharge requirements issued by the Regional Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots and existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Urban Runoff Management Plan (RURMP) – A written description of the specific regional urban runoff management measures and programs that the Copermittees will collectively implement to comply with this Order and ensure that pollutant discharges in urban runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent urban runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage.

Standard Urban Storm Water Mitigation Plan (SUSMP) – A plan developed to mitigate the impacts of urban runoff from Priority Development Projects.

Third Party Inspectors - Industrial and commercial facility inspectors who are not contracted or employed by a regulatory agency or group of regulatory agencies, such as the Regional Board or Copermittees. The third party inspector is not a regular facility employee self-inspecting their own facility. The third party inspector could be a contractor or consultant employed by a facility or group of businesses to conduct inspections.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Water Quality Control Plan, San Diego Basin, Region 9, (Basin Plan), state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Urban Runoff - All flows in a storm water conveyance system and consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water illicit discharges (dry weather flows).

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Assessment – Assessment conducted to evaluate the condition of non-storm water and storm water discharges, and the water bodies which receive these discharges.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans.

Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - The beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of water and the water quality objectives necessary to protect those uses.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition. Under this definition, a MS4 is always considered to be a Waters of the State.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other

than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Watershed Urban Runoff Management Plan (WURMP) – A written description of the specific watershed urban runoff management measures and programs that each watershed group of Copermittees will implement to comply with this Order and ensure that pollutant discharges in urban runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

WDRs – Waste Discharge Requirements

Wet Season – October 1 through April 30 of each year.

ATTACHMENT D

SCHEDULED SUBMITTALS SUMMARY

Submittal	Permit Section	Completion Date	Frequency
Submit identification of discharges not to be prohibited and BMPs required for treatment of discharges not prohibited	B.2	365 days after adoption of the Order	One Time
Submit Certified Statement of Adequate Legal Authority	C.2	365 days after adoption of the Order	One Time
Long-Term Effectiveness Assessment	I.5 and J.2.b	210 days prior to Order expiration	One Time
Submit to Principal Permittee(s) individual JURMPs	J.1.a.(1)	Prior to 365 days after adoption of the Order (Principal Permittee specifies date of submittal)	One Time
Principal Permittee submits JURMPs to Regional Board	J.1.a.(2)	365 days after adoption of the Order	One Time
Lead Watershed Permittees submit WURMPs to Principal Permittee	J..1.b.(2)	Prior to 365 days after adoption of the Order (Principal Permittee specifies date of submittal)	One Time
Principal Permittee submits WURMPs to Regional Board	J.1.b.(3)	365 days after adoption of the Order	One Time
Principal Permittee submits RURMP to Regional Board	J.1.c.(2)	365 days after adoption of the Order	One Time
Principal Permittee submits Hydromodification Management Plan workplan	J.2.a.(2)(a)	180 days after adoption of the Order	One Time
Principal Permittee submits Hydromodification Management Plan progress report	J.2.a.(2)(b)	18 months after adoption of the Order	One Time
Principal Permittee submits draft Hydromodification Management Plan	J.2.a.(2)(c)	2 years after adoption of the Order	One Time
Principal Permittee submits final Hydromodification Management Plan	J.2.a.(2)(d)	180 days after receiving comments from Regional Board	One Time
Principal Permittee submits Model SUSMP update	J.2.b	18 months after adoption of the Order	One Time
Copermittees submit local SUSMP updates	J.2.b	365 days after acceptance of updated Model SUSMP	One Time
Principal Permittee submits Report of Waste Discharge and Long-Term Effectiveness Assessment	J.2.c-d	210 days prior to Order expiration	One Time
Principal Permittee submits Notification of Principal Permittee	M	180 days after adoption of the Order	One Time
Principal Permittee submits formal agreement between Copermittees which provides management structure for meeting Order requirements	M.5	180 days after adoption of Order	One Time
Submit to Principal Permittee individual Jurisdictional Urban Runoff Management Program Annual Reports	J.3.a.(1)	Prior to September 30, 2008, and annually thereafter (Principal Permittee specifies date of submittal)	Annually
Principal Permittee submits unified Jurisdictional Urban Runoff Management Program Annual Report to Regional Board	J.3.a.(2)	September 30, 2008, and annually thereafter	Annually
Lead Watershed Permittees submit to Principal Permittee Watershed Urban Runoff Management Program Annual Reports	J.3.b.(3)	Prior to January 31, 2009 and annually thereafter (Principal Permittee specifies date of submittal)	Annually
Principal Permittee submits unified Watershed Urban Runoff Management Program Annual Report to Regional Board	J.3.b.(3)	January 31, 2009 and annually thereafter	Annually
Principal Permittee submits Regional Urban Runoff	J.3.c	January 31, 2009 and	Annually

Submittal	Permit Section	Completion Date	Frequency
Management Program Annual Report to Regional Board		annually thereafter	
Principal Permittee submits description of Receiving Waters Monitoring Program	Monitoring and Reporting Program, III.A.1	September 1, 2007 and annually thereafter	Annually
Principal Permittee submits description of various monitoring program components	Monitoring and Reporting Program, III.A.3	July 1, 2007 and July 1, 2008	Twice
Principal Permittee submits Receiving Waters Monitoring Program Annual Report	Monitoring and Reporting Program, III.A.2	January 31, 2009 and annually thereafter	Annually
Principal Permittee submits interim Receiving Waters Monitoring Program Annual Report	Monitoring and Reporting Program, III.B	January 31, 2007 and January 31, 2008	Twice
Principal Permittee submits unified interim Jurisdictional URMP and Watershed URMP Annual Reports	J.4	January 31, 2007 and January 31, 2008	Twice
Principal Permittee(s) shall submit standardized formats for all reports required under this Order	M.6	180 days after adoption of Order	One Time

RECEIVING WATERS AND URBAN RUNOFF MONITORING AND REPORTING PROGRAM NO. R9-2007-0001

I. PURPOSE

A. This Receiving Waters and Urban Runoff Monitoring and Reporting Program is intended to meet the following goals:

1. Assess compliance with Order No. R9-2007-0001;
2. Measure and improve the effectiveness of the Copermittees' urban runoff management programs;
3. Assess the chemical, physical, and biological impacts to receiving waters resulting from urban runoff discharges;
4. Characterize urban runoff discharges;
5. Identify sources of specific pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions;
7. Detect and eliminate illicit discharges and illicit connections to the MS4; and
8. Assess the overall health of receiving waters.

B. In addition, this Receiving Waters and Urban Runoff Monitoring and Reporting Program is designed to answer the following core management questions:

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

II. MONITORING PROGRAM

A. Receiving Waters Monitoring Program

Each Copermittee shall collaborate with the other Copermittees to develop, conduct, and report on a year round watershed based Receiving Waters Monitoring Program. The monitoring program design, implementation, analysis, assessment, and reporting shall be conducted on a watershed basis for each of the hydrologic units. The monitoring program shall be designed to meet the goals and answer the questions listed in section I above. The monitoring program shall include the following components:

1. MASS LOADING STATION (MLS) MONITORING

a. The following existing mass loading stations shall continue to be monitored: Santa Margarita River,[1] San Luis Rey River, Agua Hedionda Creek, Escondido Creek, San Dieguito River, Penasquitos, Tecolote Creek, San Diego River,

[1] For the Santa Margarita River mass loading station, if Camp Pendleton will not conduct the required monitoring or prevents access for the Copermittees to conduct the required monitoring, the mass loading station location shall be moved to where the County of San Diego has land-use jurisdiction.

Chollas Creek, Sweetwater River, and Tijuana River. The mass loading stations shall be monitored at the frequency identified in Table 1.

Table 1. Monitoring Rotation and Number of Stations in Watersheds

Watershed Management Area	Watershed	Permit Year 1 2007-2008				Permit Year 2 2008-2009				Permit Year 3 2009-2010				Permit Year 4 2010-2011				Permit Year 5 2011-2012			
		MLS	TWAS	ABLM	BA	MLS	TWAS	ABLM	BA	MLS	TWAS	ABLM	BA	MLS	TWAS	ABLM	BA	MLS	TWAS	ABLM	BA
Santa Margarita	Santa Margarita River	1		Implement refined program based on assessment	4	1	Bight '08					Implement refined program based on assessment		1		Implement refined program based on assessment	4			Implement refined program based on assessment	
San Luis Rey	San Luis Rey River	1	2		3	1								1	2		3				
Carlsbad	Buena Vista Creek		1		1										1		1				
	Agua Hedionda Creek	1	1		2	1								1	1		2				
	Escondido Creek	1	1		2	1								1	1		2				
San Dieguito	San Dieguito River	1	2		3	1								1	2		3				
Penasquitos	Penasquitos	1	2		3	1								1	2		3				
Mission Bay	Rose Creek										1		1						1		1
	Tecolote Creek					1				1	1		2					1	1		2
San Diego River	San Diego River					1				1	3		4					1	3		4
San Diego Bay	Chollas Creek	1			1	1				1			1	1			1	1			1
	Sweetwater River					1				1	1		2					1	1		2
	Otay River										1		1						1		1
Tijuana	Tijuana River					1				1	2		3					1	1		2

b. Each mass loading station to be monitored in a given year shall be monitored twice during wet weather events and twice during dry weather flow events. The exception is the 2008-2009 monitoring year, which shall include monitoring of all mass loading stations for one wet weather flow event only if the Copermittees participate in Bight '08.

c. Each mass loading station shall be monitored for the first wet weather event of the season which meets the USEPA's criteria as described in 40 CFR 122.21(g)(7). Monitoring of the second wet weather event shall be conducted after February 1. Dry weather mass loading monitoring events shall be sampled in September or October prior to the start of the wet weather season and in May or June after the end of the wet weather season. If flows are not evident in September or October, then sampling shall be conducted during non-rain events in the wet weather season.

d. Mass loading sampling and analysis protocols shall be consistent with 40 CFR 122.21(g)(7)(ii) and with the USEPA Storm Water Sampling Guidance Document (EPA 833-B-92-001). If practicable, the protocols for mass loading sampling and analysis should be SWAMP comparable. If the mass loading sampling and analysis are determined to be impracticable with the SWAMP standards, the Copermittees should provide explanation and discussion to this effect in the Receiving Waters and Urban Runoff Monitoring Annual Report. Wet weather samples shall be flow-weighted composites, collected for the duration of the entire runoff event, where practical. Where such monitoring is not practical, such as for large watersheds with significant groundwater recharge flows, composites shall be collected at a minimum during the first 3 hours of flow. Dry weather event samples shall be flow-weighted composites, collected for a time duration adequate to be representative of changes in pollutant concentrations and runoff flows which may occur over a typical 24 hour period. A minimum of 3 sample aliquots, separated by a minimum of 15 minutes, shall be taken for each hour of monitoring, unless the Regional Board Executive Officer approves an alternate protocol. Automatic samplers shall be used to collect samples from mass loading stations. Grab samples shall be taken for temperature, pH, specific conductance, biochemical oxygen demand, oil and grease, total coliform, fecal coliform, and enterococcus.

e. Copermittees shall measure or estimate flow rates and volumes for each mass loading station sampling event in order to determine mass loadings of pollutants. Data from nearby USGS gauging stations may be utilized, or flow rates may be estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), Section 3.2.1.

f. In the event that the required number of events are not sampled during one monitoring year at any given station, the Copermittees shall submit, with the subsequent Receiving Waters Monitoring Annual Report, a written explanation for a lack of sampling data, including streamflow data from the nearest USGS gauging station.

g. The following constituents shall be analyzed for each monitoring event at each station:

Table 2. Analytical Testing for Mass Loading and Temporary Watershed Assessment Stations

Conventionals, Nutrients, Hydrocarbons	**Pesticides**	**Metals (Total and Dissolved)**	**Bacteriological**
Total Dissolved Solids	Diazinon	Antimony	Total Coliform
Total Suspended Solids	Chlorpyrifos	Arsenic	Fecal Coliform
Turbidity	Malathion	Cadmium	Enterococcus
Total Hardness		Chromium	
pH		Copper	
Specific Conductance		Lead	
Temperature		Nickel	
Dissolved Phosphorus		Selenium	
Nitrite		Zinc	
Nitrate			
Total Kjeldahl Nitrogen			
Ammonia			
Biological Oxygen Demand, 5-day			
Chemical Oxygen Demand			
Total Organic Carbon			
Dissolved Organic Carbon			
Methylene Blue Active Substances			
Oil and Grease			

h. In addition to the constituents listed in Table 2 above, monitoring stations in the Chollas Creek watershed shall also analyze samples for polychlorinated biphenyls (PCBs), Chlordane, and polycyclic aromatic hydrocarbons (PAHs) for each monitoring event.

i. The following toxicity testing shall be conducted for each monitoring event at each station as follows:
   (1) 7-day chronic test with the cladoceran *Ceriodaphnia dubia* (USEPA protocol EPA-821-R-02-013).
   (2) Chronic test with the freshwater algae *Selenastrum capricornutum* (USEPA protocol EPA-821-R-02-013).
   (3) Acute survival test with amphipod *Hyalella azteca* (USEPA protocol EPA-821-R-02-012).

j. The presence of acute toxicity shall be determined in accordance with USEPA protocol (EPA-821-R-02-012). The presence of chronic toxicity shall be determined in accordance with USEPA protocol (EPA-821-R-02-013).

k. The Copermittees shall collaborate to develop and implement a program to assess the presence of trash (anthropogenic litter) in receiving waters. The program shall collect and evaluate trash data in conjunction with collection and evaluation of analytical data. This monitoring program shall be implemented within each watershed and shall begin no later than the 2007-2008 monitoring year.

2. TEMPORARY WATERSHED ASSESSMENT STATION (TWAS) MONITORING

a. The minimum number of temporary watershed assessment stations to be monitored in a given monitoring year is identified in Table 1. The number of stations located within each watershed may change from the number identified in Table 1, provided the total number of stations monitored in a given year is not reduced below the minimum number of stations identified in Table 1. The

temporary watershed assessment stations shall be monitored and located according to a systematic plan which:

(1) Ensures that the Copermittees' Receiving Waters Monitoring Program most effectively answers questions 1-5 of section I.B above.
(2) Provides statistically useful information.
(3) Identifies the extent and magnitude of receiving water problems within each watershed.
(4) Provides spatial coverage of each watershed.
(5) Monitors previously un-assessed sub-watershed areas.
(6) Focuses on specific areas of concern and high priority areas.
(7) Provides adequate information to assess the effectiveness of implemented programs and control measures in reducing discharged pollutant loads and improving urban runoff and receiving water quality.

b. For each temporary watershed assessment station identified to be monitored in a given year, the station shall be monitored twice during wet weather events and twice during dry weather flow events.

c. Temporary watershed assessment stations shall be monitored in the same manner as the mass loading stations in accordance with the monitoring protocols and requirements outlined in sections II.A.1.c-k above.

3. BIOASSESSMENT (BA) MONITORING

a. The minimum number of bioassessment stations to be monitored in each watershed in a given monitoring year is identified in Table 1. Bioassessment stations shall include an adequate number of reference stations, with locations of reference stations identified according to protocols outlined in "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams," by Ode, et al. 2005.[2]

b. Bioassessment stations shall be collocated with both mass loading stations and temporary watershed assessment stations where feasible.

c. Bioassessment stations to be monitored in a given monitoring year shall be monitored in May or June (to represent the influence of wet weather on the communities) and September or October (to represent the influence of dry weather flows on the communities). The timing of monitoring of bioassessment stations shall coincide with dry weather monitoring of mass loading and temporary watershed assessment stations.

d. Monitoring of bioassessment stations shall utilize the targeted riffle composite approach, as specified in the Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Management Plan (QAMP), as amended.

[2] Ode, et al. 2005. "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams." Environmental Management. Vol. 35, No. 1, pp. 1-13.

e. Monitoring of bioassessment stations shall incorporate assessment of periphyton in addition to macroinvertebrates, using the USEPA's 1999 Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers.[3]

f. Bioassessment analysis procedures shall include calculation of the Index of Biotic Integrity (IBI) for benthic macroinvertebrates for all bioassessment stations, as outlined in "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams," by Ode, et al. 2005.

g. A professional environmental laboratory shall perform all sampling, laboratory, quality assurance, and analytical procedures.

4. FOLLOW-UP ANALYSIS AND ACTIONS

When results from the chemistry, toxicity, and bioassessment monitoring described above indicate urban runoff-induced degradation at a mass loading or temporary watershed assessment station, Copermittees within the watershed shall evaluate the extent and causes of urban runoff pollution in receiving waters and prioritize and implement management actions to eliminate or reduce sources. Toxicity Identification Evaluations (TIEs) shall be conducted to determine the cause of toxicity as outlined in Table 3 below. Other follow-up activities which shall be conducted by the Copermittees are also identified in Table 3. Once the cause of toxicity has been identified by a TIE, the Copermittees shall perform source identification projects as needed and implement the measures necessary to reduce the pollutant discharges and abate the sources causing the toxicity.

Table 3. Triad Approach to Determining Follow-Up Actions

	Chemistry[4]	**Toxicity[5]**	**Bioassessment[6]**	**Action**
1.	Persistent exceedance of water quality objectives (high frequency constituent of concern identified)	Evidence of persistent toxicity	Indications of alteration	Conduct TIE to identify contaminants of concern, based on TIE metric. Address upstream sources as a high priority.
2.	No persistent exceedances of water quality objectives	No evidence of persistent toxicity	No indications of alteration	No action necessary.

[3] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA-841-B-99-002.

[4] Persistent exceedance shall mean exceedances of established water quality objectives, benchmarks, or action levels by a pollutant known to cause toxicity for two wet weather and/or two dry weather samples in a given year.

[5] Toxicity shall mean when the Lowest Observed Effect Concentration (LOEC) (for chronic toxicity tests) or median lethal concentration (LC_{50}) (for acute toxicity tests) for any given species is less than or equal to 100% of the test sample and observed effects are significantly different from the control. Evidence of persistent toxicity shall mean toxicity to a specific test organism in more than 50% of the samples taken for a given location during a given monitoring year. When a monitoring event has the potential to indicate evidence of persistent toxicity (e.g. the third event of four monitoring events), sufficient samples shall be collected in order to conduct any TIEs that may be required. When a sample collected in order to conduct a TIE does not result in mortality or exhibit a toxic effect in at least 50% of the applicable test organisms in the 100% storm water sample, the TIE may be conducted with a sample collected during the next monitoring event.

[6] Indications of alteration shall mean an IBI score of Poor or Very Poor.

	Chemistry[4]	Toxicity[5]	Bioassessment[6]	Action
3.	Persistent exceedance of water quality objectives (high frequency constituent of concern identified)	No evidence of persistent toxicity	No indications of alteration	Address upstream sources as a low priority.
4.	No persistent exceedances of water quality objectives	Evidence of persistent toxicity	No indications of alteration	Conduct TIE to identify contaminants of concern, based on TIE metric. Address upstream sources as medium priority.
5.	No persistent exceedances of water quality objectives	No evidence of persistent toxicity	Indications of alteration	No action necessary to address toxic chemicals. Address potential role of urban runoff in causing physical habitat disturbance.
6.	Persistent exceedance of water quality objective (high frequency constituent of concern identified)	Evidence of persistent toxicity	No indications of alteration	If chemical and toxicity tests indicate persistent degradation, conduct TIE to identify contaminants of concern, based on TIE metric and address upstream source as a medium priority.
7.	No persistent exceedances of water quality objectives	Evidence of persistent toxicity	Indications of alteration	Conduct TIE to identify contaminants of concern, based on TIE metric. Address upstream sources as a high priority. Address potential role of urban runoff causing physical habitat disturbance.
8.	Persistent exceedance of water quality objectives objective (high frequency constituent of concern identified)	No evidence of persistent toxicity	Indications of alteration	Address upstream source as a high priority.

5. AMBIENT BAY AND LAGOON MONITORING (ABLM)

   a. Ambient Bay and Lagoon Monitoring shall be conducted according to the schedule identified in Table 1.

   b. If results of the Ambient Bay and Lagoon Monitoring assessment indicate a general relationship and/or linkage between conditions in bays/lagoons/estuaries with conditions at mass loading stations, then monitoring shall be conducted at the following locations: Santa Margarita River Estuary, Oceanside Harbor, San Luis Rey Estuary, Buena Vista Lagoon, Agua Hedionda Lagoon, Batiquitos Lagoon, San Elijo Lagoon, San Dieguito Lagoon, Los Penasquitos Lagoon, Mission Bay, Sweetwater River Estuary, and Tijuana River Estuary. This monitoring shall be designed to most effectively answer each of questions 1-5 of section I.B above as they pertain to bays/lagoons/estuaries.

c. If results of the Ambient Bay and Lagoon Monitoring assessment do not indicate a relationship and/or linkage between conditions in bays/lagoons/estuaries with conditions at mass loading stations, then monitoring shall be conducted for special investigations of the bays/lagoons/estuaries. These special investigations shall be designed to most effectively answer each of questions 1-5 of section I.B above as they pertain to bays/lagoons/estuaries, with an emphasis on answering question 4.

d. Ambient Bay and Lagoon Monitoring shall utilize the triad approach, analyzing chemistry, toxicity, and benthic infauna data.

e. Ambient Bay and Lagoon Monitoring shall include a water column monitoring component as necessary to supply information needed for the development, implementation, and assessment of Total Maximum Daily Loads (TMDLs).

6. COASTAL STORM DRAIN MONITORING

The Copermittees shall collaborate to develop and implement a coastal storm drain monitoring program. The monitoring program shall include:

a. Identification of coastal storm drains which discharge to coastal waters.

b. Monthly sampling of all flowing coastal storm drains identified in section II.A.6.a for total coliform, fecal coliform, and enterococcus.[7] Where flowing coastal storm drains are discharging to coastal waters, paired samples from the storm drain discharge and coastal water (25 yards down current of the discharge) shall be collected. If flowing coastal storm drains are not discharging to coastal waters, only the storm drain discharge needs to be sampled.

(1) Frequency of sampling of coastal storm drains may be reduced to every other month if the paired coastal storm drain data:

(a) Exhibits three consecutive storm drain samples with all bacterial indicators below the Copermittees' sampling frequency reduction criteria, as the sampling frequency reduction criteria was developed under Order No. 2001-01.
(b) Exhibits that the three consecutive samples discussed in (a) above are paired with receiving water samples that do not exceed Assembly Bill (AB) 411 or Basin Plan standards.
(c) Exhibits that less than 20% of the storm drain samples were above any of the sampling frequency reduction criteria during the previous year.

(2) The Copermittees shall notify the Regional Board of any coastal storm drains eligible for sampling frequency reduction prior to October 1 of each year. Sampling frequency reduction shall not occur prior to Regional Board

[7] Coastal storm drains where sampler safety, habitat impacts from sampling, or inaccessibility are issues need not be sampled. Such coastal storm drains shall be added to the Copermittee's dry weather field screening and analytical monitoring program where feasible.

notification.

(3) Re-sampling shall be implemented within one business day of receipt of analytical results for coastal storm drains where:

(a) Both storm drain and receiving water samples exceed AB 411 or Basin Plan standards for any bacterial indicator.
(b) The storm drain sample exceeds 95th percentile observations of the previous year's data for any bacterial indicator.

(4) If re-sampling conducted under section (3) above exhibits continued exceedances of a AB 411 or Basin Plan standards in either the storm drain or receiving water, investigations of sources of bacterial contamination shall commence within one business day of receipt of analytical results.

(5) Investigations of sources of bacterial contamination shall occur immediately if evidence of abnormally high flows, sewage releases, restaurant discharges, and/or similar evidence is observed during sampling.

(6) Exceedances of public health standards for bacterial indicators shall be reported to the County Department of Environmental Health as soon as possible.

7. PYRETHROIDS MONITORING

The Copermittees shall collaborate to develop and implement a monitoring program to measure and assess the presence of pyrethroids in receiving waters. This monitoring program shall be implemented within each watershed and shall begin no later than the 2007-2008 monitoring year.

B. Urban Runoff Monitoring

Each Copermittee shall collaborate with the other Copermittees to develop, conduct, and report on a year round watershed based Urban Runoff Monitoring Program. The monitoring program design, implementation, analysis, assessment, and reporting shall be conducted on a watershed basis for each of the hydrologic units. The monitoring program shall be designed to meet the goals and answer the questions listed in section I above. The monitoring program shall include the following components

1. MS4 OUTFALL MONITORING

The Copermittees shall collaborate to develop and implement a monitoring program to characterize pollutant discharges from MS4 outfalls in each watershed during wet and dry weather. The program shall include rationale and criteria for selection of outfalls to be monitored. The program shall at a minimum include collection of samples for those pollutants causing or contributing to violations of water quality standards within the watershed. This monitoring program shall be implemented within each watershed and shall begin within the 2007-2008 monitoring year.

2. SOURCE IDENTIFICATION MONITORING

The Copermittees shall collaborate to develop and implement a monitoring program to identify sources of discharges of pollutants causing the priority water quality problems within each watershed. The monitoring program shall include focused monitoring which moves upstream into each watershed as necessary to identify sources. The monitoring program shall use source inventories and "Threat to Water Quality" analysis to guide monitoring efforts. This monitoring program shall be implemented within each watershed and shall begin no later than the 2008-2009 monitoring year.

3. DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING

As part of its Jurisdictional Urban Runoff Management Program, each Copermittee shall update as necessary its dry weather field screening and analytical monitoring program to meet or exceed the requirements of this section. Dry weather analytical and field screening monitoring consists of (1) field observations; (2) field screening monitoring; and (3) analytical monitoring at selected stations. The Dry Weather Field Screening and Analytical Monitoring program is not required to be SWAMP comparable. Each Copermittee's program shall be designed to detect and eliminate illicit connections and illegal discharges to the MS4 using frequent, geographically widespread dry weather discharge monitoring and follow-up investigations. Each Copermittee shall conduct the following dry weather field screening and analytical monitoring tasks:

a. Select Dry Weather Field Screening and Analytical Monitoring Stations

Based upon a review of its past Dry Weather Monitoring Program, each Copermittee shall select dry weather field screening and analytical monitoring stations within its jurisdiction. No more than 500 dry weather field screening and analytical monitoring stations (excluding alternate stations) need to be selected by any individual Copermittee for any given year. Stations shall be selected according to one of the following methods:

(1) Stations shall be either major outfalls or other outfall points (or any other point of access such as manholes) randomly located throughout the MS4 by placing a grid over a drainage system map and identifying those cells of the grid which contain a segment of the MS4 or major outfall. This random selection has to use the following guidelines and criteria:

(a) A grid system consisting of perpendicular north-south and east-west lines spaced ¼ mile apart shall be overlayed on a map of the MS4, creating a series of cells;
(b) All cells that contain a segment of the MS4 shall be identified and one dry weather analytical monitoring station shall be selected in each cell.
(c) Each Copermittee shall determine alternate stations to be sampled in place of selected stations that do not have flow.

(2) Stations may be selected non-randomly provided adequate coverage of the entire MS4 system is ensured and that the selection of stations meets,

exceeds, or provides equivalent coverage to the requirements given above. The dry weather analytical and field screening monitoring stations shall be established using the following guidelines and criteria:

(a) Stations should be located downstream of any sources of suspected illegal or illicit activity;
(b) Stations shall be located to the degree practicable at the farthest manhole or other accessible location downstream in the system within each cell;
(c) Hydrological conditions, total drainage area of the site, traffic density, age of the structures or buildings in the area, history of the area, and land use types shall be considered in locating stations;
(d) Each Copermittee shall determine alternate stations to be sampled in place of selected stations that do not have flow.

b. Complete MS4 Map

Each Copermittee shall clearly identify each dry weather field screening and analytical monitoring station on its MS4 Map as either a separate GIS layer or a map overlay hereafter referred to as a Dry Weather Field Screening and Analytical Stations Map. Each Copermittee shall confirm that each drainage area within its jurisdiction contains at least one station.

c. Develop Dry Weather Field Screening and Analytical Monitoring Procedures

Each Copermittee shall develop and/or update written procedures for dry weather field screening and analytical monitoring (for analytical monitoring only, these procedures must be consistent with 40 CFR part 136), including field observations, monitoring, and analyses to be conducted. At a minimum, the procedures must meet the following guidelines and criteria:

(1) Determining Sampling Frequency: Dry weather field screening and analytical monitoring shall be conducted at each identified station at least once between May 1st and September 30th of each year or as often as the Copermittee determines is necessary to comply with the requirements of section D.4 of Order No. R9-2007-0001.

(2) If flow or ponded runoff is observed at a dry weather field screening or analytical monitoring station and there has been at least seventy-two (72) hours of dry weather, make observations and collect at least one (1) grab sample. Record general information such as time since last rain, quantity of last rain, site descriptions (i.e., conveyance type, dominant watershed land uses), flow estimation (i.e., width of water surface, approximate depth of water, approximate flow velocity, flow rate), and visual observations (i.e., odor, color, clarity, floatables, deposits/stains, vegetation condition, structural condition, and biology).

(3) At a minimum, collect samples for analytical laboratory analysis of the following constituents for at least twenty five percent (25%) of the dry weather monitoring stations where water is present:

(a) Total Hardness
(b) Oil and Grease
(c) Diazinon and Chlorpyrifos
(d) Cadmium (Dissolved)
(e) Lead (Dissolved)
(f) Zinc (Dissolved)
(g) Copper (Dissolved)
(h) Enterococcus bacteria[8]
(i) Total Coliform bacteria[8]
(j) Fecal Coliform bacteria[8]

(4) At a minimum, conduct field screening analysis of the following constituents at all dry weather monitoring stations where water is present:

(a) Specific conductance (calculate estimated Total Dissolved Solids).
(b) Turbidity
(c) pH
(d) Reactive Phosphorous
(e) Nitrate Nitrogen
(f) Ammonia Nitrogen
(g) Surfactants (MBAS)

(5) If the station is dry (no flowing or ponded runoff), make and record all applicable observations and select another station from the list of alternate stations for monitoring.

(6) Develop and/or update criteria for dry weather field screening and analytical monitoring results whereby exceedance of the criteria will require follow-up investigations to be conducted to identify and eliminate the source causing the exceedance of the criteria.

(7) Assess the presence of trash in receiving waters and urban runoff at each dry weather field screening or analytical monitoring station. Assessments of trash shall provide information on the spatial extent and amount of trash present, as well as the nature of the types of trash present.

(8) Dry weather field screening and analytical monitoring stations identified to exceed dry weather monitoring criteria for any constituents shall continue to be screened in subsequent years.

(9) Develop and/or update procedures for source identification follow up investigations in the event of exceedance of dry weather field screening and analytical monitoring result criteria. These procedures shall be consistent with procedures required in section D.4.d of Order No. R9-2007-0001.

(10) Develop and/or update procedures to eliminate detected illicit discharges and connections. These procedures shall be consistent with each Copermittees

[8] Colilert and Enterolert may be used as alternative methods with Fecal Coliform determined by calculations.

Illicit Discharge and Elimination component of its Jurisdictional Urban Runoff Management Plan as discussed in section D.4 of Order No. R9-2007-0001.

d. Conduct Dry Weather Field Screening and Analytical Monitoring

The Copermittees shall commence implementation of dry weather field screening and analytical monitoring under the requirements of this Order by May 1, 2008. Each Copermittee shall conduct dry weather analytical and field screening monitoring in accordance with its storm water conveyance system map and dry weather analytical and field screening monitoring procedures as described in section II.B.3 above. If monitoring indicates an illicit connection or illegal discharge, conduct the follow-up investigation and elimination activities as described in submitted dry weather field screening and analytical monitoring procedures and sections D.4.d and D.4.e of Order No. R9-2007-0001. Until the dry weather field screening and analytical monitoring program is implemented under the requirements of this Order, each Copermittee shall continue to implement dry weather field screening and analytical monitoring as it was most recently implemented pursuant to Order No. 2001-01.

C. Regional Monitoring Program

1. The Copermittees shall participate and coordinate with federal, state, and local agencies and other dischargers in development and implementation of a regional watershed monitoring program as directed by the Executive Officer.

2. Bight '08

a. During the 2008-2009 monitoring year (Permit Year 2), the Copermittees may participate in the Bight '08 study. The Copermittees shall ensure that such participation results in collection and analysis of data useful in addressing the goals and management questions of the Receiving Waters Monitoring Program. Any participation shall include the contribution of all funds not otherwise spent on full implementation of mass loading station, temporary watershed assessment station, ambient bay and lagoon, and bioassessment monitoring. All other monitoring shall continue during the 2008-2009 monitoring year (Permit Year 2) as required.

b. If the Copermittees do not participate in Bight '08, mass loading station, temporary watershed assessment station, ambient bay an lagoon, and bioassessment monitoring shall be conducted as follows:

(1) Permit Year 3 (2009-2010) monitoring shall be conducted in Permit Year 2 (2008-2009) (see Table 1).
(2) Permit Year 4 (2010-2011) monitoring shall be conducted in Permit Year 3 (2009-2010) (see Table 1).
(3) Permit Year 5 (2011-2012) monitoring shall be conducted in Permit Year 4 (2010-2011).

(4) Permit Year 1 (2007-2008) monitoring shall be conducted in Permit Year 5 (2011-2012).

c. If the Copermittees partially participate in Bight '08, monitoring shall be conducted as described in section II.C.2.b above, with the exception of any monitoring offset by the contribution of funds to Bight '08.

D. Special Studies

1. TMDL MONITORING

   a. All monitoring shall be conducted as required in Investigation Order No. R9-2004-0277 for Chollas Creek.

2. REGIONAL HARBOR MONITORING

   a. The Copermittees which discharge to harbors shall participate in the development and implementation of the Regional Harbor Monitoring Program.

3. The Copermittees shall conduct special studies, including any monitoring required for TMDL development and implementation, as directed by the Executive Officer.

E. Monitoring Provisions

All monitoring activities shall meet the following requirements:

1. Where procedures are not otherwise specified in this Receiving Waters Monitoring and Reporting Program (e.g., Dry Weather Field Screening and Analytical Monitoring), sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (SWRCB).

2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [40 CFR 122.41(j)(1)].

3. The Copermittees shall retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the Report of Waste Discharge and application for this Order, for a period of at least five (5) years from the date of the sample, measurement, report, or application. This period may be extended by request of the Regional Board or USEPA at any time and shall be extended during the course of any unresolved litigation regarding this discharge. [40 CFR 122.41(j)(2), CWC section 13383(a)]

4. Records of monitoring information shall include [40 CFR 122.41(j)(3)]:

   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

5. All sampling, sample preservation, and analyses must be conducted according to test procedures approved under 40 CFR part 136, unless other test procedures have been specified in this Receiving Waters Monitoring and Reporting Program or approved by the Executive Officer [40 CFR 122.41(j)(4)].

6. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both. [40 CFR 122.41(j)(5)]

7. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this Receiving Waters Monitoring and Reporting Program. [40 CFR 122.41(l)(4)(iii)]

8. All chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services or a laboratory approved by the Executive Officer.

9. For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees shall instruct its laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the Regional Board for approval prior to raising the ML for any priority toxic pollutant.

10. The Regional Board Executive Officer or the Regional Board may make revisions to this Receiving Waters and Urban Runoff Monitoring and Reporting Program at any time during the term of Order No. R9-2007-0001, and may include a reduction or increase in the number of parameters to be monitored, locations monitored, the frequency of monitoring, or the number and size of samples collected.

11. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six

months per violation, or by both. [40 CFR 122.41(k)(2)]

12. Monitoring shall be conducted according the USEPA test procedures approved under 40 CFR 136, "Guidelines Establishing Test Procedures for Analysis of Pollutants under the Clean Water Act" as amended, unless other test procedures have been specified in this Receiving Waters and Urban Runoff Monitoring and Reporting Program, in Order No. R9-2007-0001, or by the Executive Officer.

13. If the discharger monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR part 136, unless otherwise specified in the Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the reports requested by the Regional Board. [40 CFR 122.41(l)(4)(ii)]

III. REPORTING PROGRAM

A. Monitoring Reporting

1. The Principal Permittee shall submit a description of the Receiving Waters and Urban Runoff Monitoring Program to be implemented for every monitoring year. The submittals shall begin on September 1, 2007, and continue every year thereafter. The submittals shall describe all monitoring to be conducted during the upcoming monitoring year. For example, the September 1, 2007 submittal shall describe the monitoring to be conducted from October 1, 2007 through September 30, 2008.

   If the Copermittees participate in Bight '08, their submittal for the 2008-2009 monitoring year shall describe the monitoring to be conducted for Bight '08 and exhibit how the monitoring will result in collection and analysis of data useful in addressing the goals and management questions of the Receiving Waters and Urban Runoff Monitoring Program.

2. The Principal Permittee shall submit the Receiving Waters and Urban Runoff Monitoring Annual Report to the Regional Board on January 31 of each year, beginning on January 31, 2009. Receiving Waters and Urban Runoff Monitoring Annual Reports shall meet the following requirements:

   a. Annual monitoring reports shall include the data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data for each monitoring program component.

   b. Annual monitoring reports shall include a watershed-based analysis of the findings of each monitoring program component. Each watershed-based analysis shall include:

      (1) Identification and prioritization of water quality problems within each watershed.
      (2) Identification and description of the nature and magnitude of potential sources of the water quality problems within each watershed.
      (3) Exhibition of pollutant load and concentration increases or decreases at each mass loading and temporary watershed assessment station.

(4) Evaluation of pollutant loads and concentrations at mass loading and temporary watershed assessment stations with respect to land use, population, sources, and other characteristics of watersheds using tools such as multiple linear regression, factor analysis, and cluster analysis.
(5) Identification of links between source activities/conditions and observed receiving water impacts.
(6) Identification of recommended future monitoring to identify and address sources of water quality problems.
(7) Results and discussion of any TIE conducted, together with actions that will be implemented to reduce the discharge of pollutants and abate the sources causing the toxicity.

c. Annual monitoring reports shall include a detailed description of all monitoring conducted under Investigation Order No. R9-2004-0277 for Chollas Creek. Annual monitoring reports shall also include all information required by Investigation Order No. R9-2004-0277.

d. Annual monitoring reports shall include discussions for each watershed which answer each of the management questions listed in section I.B of this Receiving Waters Monitoring and Reporting Program.

e. Annual monitoring reports shall identify how each of the goals listed in section I.A of this Receiving Waters Monitoring and Reporting Program has been addressed by the Copermittees' monitoring.

f. Annual monitoring reports shall include identification and analysis of any long-term trends in storm water or receiving water quality. Trend analysis shall use nonparametric approaches, such as the Mann-Kendall test, including exogenous variables in a multiple regression model, and/or using a seasonal nonparametric trend model, where applicable.

g. Annual monitoring reports shall provide an estimation of total pollutant loads (wet weather loads plus dry weather loads) due to urban runoff for each of the watersheds specified in Table 4 of Order No. R9-2007-0001.

h. Annual monitoring reports shall for each monitoring program component listed above, include an assessment of compliance with applicable water quality standards.

i. Annual monitoring reports shall describe monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance/quality control procedures, and sampling and analysis protocols.

j. Annual monitoring reports shall use a standard report format and shall include the following:

(1) A stand alone comprehensive executive summary addressing all sections of the monitoring report;
(2) Comprehensive interpretations and conclusions; and

(3) Recommendations for future actions.

k. All monitoring reports submitted to the Principal Permittee or the Regional Board shall contain the certified perjury statement described in Attachment B of Order No. R9-2007-0001.

l. Annual monitoring reports shall be reviewed prior to submittal to the Regional Board by a committee (consisting of no less than three members). All review comments shall also be submitted to the Regional Board.

m. Annual monitoring reports shall be submitted in both electronic and paper formats.

3. The Principal Permittee shall submit by July 1, 2007 a detailed description of the monitoring programs to be implemented under requirements II.A.1.k, II.A.7, and II.B.3.c.(7) of Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001. The Principal Permittee shall submit by July 1, 2008, a detailed description of the monitoring programs to be implemented under requirement II.B.1 and II.B.2 of Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001. The description shall identify and provide the rationale for the constituents monitored, locations of monitoring, frequency of monitoring, and analyses to be conducted with the data generated.

4. By January 31, 2010, the City of San Diego shall submit a report which evaluates the data and assumptions used to estimate the WLA to Shelter Island Yacht Basin of 30 kg Cu/year. The report shall evaluate if any changes have occurred in the watershed which could cause or contribute to a higher copper urban runoff discharge and any actions necessary to address these changes. The report shall be an attachment to the Watershed Urban Runoff Management Program Annual Report for the San Diego Bay watershed.

5. Monitoring programs and reports shall comply with section II.E of Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001 and Attachment B of Order No. R9-2007-0001.

6. Following completion of an annual cycle of monitoring in October, the Copermittees shall make the monitoring data and results available to the Regional Board at the Regional Board's request.

B. Interim Reporting Requirements

For the October 2005-October 2006 and October 2006-October 2007 monitoring periods, the Principal Permittee shall submit the Receiving Waters Monitoring Annual Reports on January 31, 2007 and January 31, 2008, respectively. The Receiving Waters Monitoring Annual Report shall address the monitoring conducted to comply with the requirements of Order No. 2001-01.

FACT SHEET/TECHNICAL REPORT

FOR

ORDER NO. R9-2007-0001
NPDES NO. CAS0108758

WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES OF URBAN RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF THE COUNTY OF SAN DIEGO, THE INCORPORATED CITIES OF SAN DIEGO COUNTY, THE SAN DIEGO UNIFIED PORT DISTRICT, AND THE SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

JANUARY 24, 2007

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Attachment E – Revised Tentative Order No. R9-2007-0001 dated January 24, 2007
Attachment F – Responses to Comments III dated January 24, 2007

I. LIST OF ACRONYMS AND ABBREVIATIONS

ADT - Average Daily Traffic
BAT - Best Available Technology
BIA - Building Industry Association of San Diego County
BMP - Best Management Practice
Basin Plan - Water Quality Control Plan for the San Diego Basin
CASQA - California Stormwater Quality Association
CCC - California Coastal Commission
CDFG - California Department of Fish and Game
CEQA - California Environmental Quality Act
CFR - Code of Federal Regulations
Copermittees - County of San Diego, the 18 incorporated cities within the County of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport Authority
CWA - Clean Water Act
CWC - California Water Code
CZARA - Coastal Zone Act Reauthorization Amendments of 1990
ESAs - Environmentally Sensitive Areas
FR - Federal Register
GIS - Geographic Information System
IC/ID - Illicit Connections and Illicit Discharges
JURMP - Jurisdictional Urban Runoff Management Plan
LARWQCB - Los Angeles Regional Water Quality Control Board
MEP - Maximum Extent Practicable
MRP - Receiving Waters Monitoring and Reporting Program
MS4 - Municipal Separate Storm Sewer System
NOI - Notice of Intent
NPDES - National Pollutant Discharge Elimination System
NRDC - Natural Resources Defense Council
NURP - Nationwide Urban Runoff Program
Regional Board - San Diego Regional Water Quality Control Board
RGOs - Retail Gasoline Outlets
ROWD - San Diego County Copermittees' Report of Waste Discharge
RURMP - Regional Urban Runoff Management Plan
RWLs - Receiving Water Limitations
SANDAG - San Diego Association of Governments
SIC - Standard Industrial Classification Code
SUSMP - Standard Urban Storm Water Mitigation Plan
SWMP - Storm Water Management Plan
SWRCB - State Water Resources Control Board
SWPPP - Storm Water Pollution Prevention Plan
TAC - State Water Resources Control Board Urban Runoff Technical Advisory Committee
TIE - Toxicity Identification Evaluation
TMDL - Total Maximum Daily Load
USEPA - United States Environmental Protection Agency
WDRs - Waste Discharge Requirements
WLAs - Waste Load Allocation
WQC - Water Quality Criteria

WQBELs - Water Quality Based Effluent Limits
WSPA - Western States Petroleum Association
WURMP - Watershed Urban Runoff Management Plan

II. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principle facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (Regional Board) considered in preparing Order No. R9-2007-0001. In accordance with the Code of Federal Regulations (CFR) title 40 parts 124.8 and 124.56, this Fact Sheet includes, but is not limited to, the following information:

- Contact information
- Public process and notification procedures
- Background information
- Permitting approach discussion
- Economic issues discussion
- Legal authority discussion
- Findings discussions
- Directives discussions

The main body of the Fact Sheet (sections IX and X) reflects the findings and requirements of the Order as they were originally proposed in Tentative Order No. R9-2006-0011, dated March 10, 2006. Through the subsequent public participation process, the findings and requirements of the Tentative Order evolved and were modified in response to comments received. These modifications, as well as discussions providing the rationale for the modifications, are provided in the Attachments to the Fact Sheet.

The Regional Board's files applicable to the issuance of Order No. R9-2007-0001 are incorporated into the administrative record in support of the findings and requirements of Order No. R9-2007-0001.

III. CONTACT INFORMATION

Regional Board

Dave Gibson, Senior Environmental Scientist
Phil Hammer, Environmental Scientist C
9174 Sky Park Court, Suite 100
San Diego, CA 92123
858-627-3988
858-571-6972 (fax)
email: phammer@waterboards.ca.gov

The Order and other related documents can be downloaded from the Regional Board website at: http://www.waterboards.ca.gov/sandiego/programs/sd_stormwater.html

All documents referenced in this Fact Sheet and in Order No. R9-2007-0001 are available for public review at the Regional Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through

Friday. To schedule an appointment to inspect public records, contact Sylvia Wellnitz at 858-637-5593, or DiAnne Broussard at 858-492-1763.

Copermittees

County of San Diego Department of Public Works Jon Van Rhyn 9325 Hazard Way San Diego, CA 92123 (858) 495-5133	City of El Cajon John Phillips 200 East Main St., Floor 4 El Cajon, CA 92020 (619) 441-5580	City of Oceanside Water Utilities Department Mo Lahsaie 300 N. Coast Highway Oceanside, CA 92057 (760) 435-5803
Unified Port of San Diego Karen Helyer P.O. Box 120488 San Diego, CA 92112-0488 (619) 725-6073	City of Encinitas Kathy Weldon 505 S. Vulcan Avenue Encinitas, CA 92024 (760) 633-2632	City of Poway Development Services Danis Bechter P.O. Box 789 Poway, CA 92074 (858) 668-4630
San Diego County Regional Airport Authority Paul Manasjan P.O. Box 82776 San Diego, CA 92138-2776 (619) 400-2783	City of Escondido Patrick Thomas 201 N. Broadway Escondido, CA 92025 (760) 839-6315	City of San Diego Stormwater Pollution Prevention Program Chris Zirkle 1970 B Street San Diego, CA 92101 (619) 525-8647
City of Carlsbad Elaine Lukey 1635 Faraday Avenue Carlsbad, CA 92008 (760) 602-7580	City of Imperial Beach Hank Levien 825 Imperial Beach Blvd. Imperial Beach, CA 91932 (619) 628-1370	City of San Marcos Public Works Jasen Boyens 201 Mata Way San Marcos, CA 92069 (760) 752-7550X3333
City of Chula Vista Khosro Aminpour 1800 Maxwell Road Chula Vista, CA 91911 (619) 397-6111	City of La Mesa Malik Tamimi 8130 Allison Avenue La Mesa, CA 91941 (619) 667-1153	City of Santee Cary Stewart 10601 Magnolia Avenue Santee, CA 92071 (619) 258-4100
City of Coronado Public Services Scott Huth 101 B Avenue Coronado, CA 92118 (619) 522-7312	City of Lemon Grove Cora Long 3232 Main Street Lemon Grove, CA 91945 (619) 825-3800X3925	City Of Solana Beach Danny King 635 South Highway 101 Solana Beach, CA 92075 (858) 720-2477
City of Del Mar Rosanna Lacarra 9275 Sky Park Court, Suite 200 San Diego, CA 92123 (858) 874-1810	City of National City Din Daneshfar 1243 National City Blvd. National City, CA 91950 (619) 336-4387	City of Vista Engineering Linda Isakson 1165 East Taylor Street Vista, Ca 92084 (760) 726-1340

IV. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The Regional Board followed the schedule listed below for the preparation of Order No. R9-2007-0001:

- In July 2004, the Regional Board issued the San Diego County Municipal Storm Water Permit Reissuance Analysis Summary, which considered various permitting options such as watershed-based permits and identified the Regional Board's preferred permitting approach for this permit cycle. The Regional Board solicited and received public comments on the document.

- From October 2004 to July 2005, the Regional Board met with the County of San Diego, the 18 incorporated cities within the County of San Diego, and the San Diego Unified Port District (hereinafter Copermittees) representatives on six occasions to discuss the Copermittees' Report of Waste Discharge (ROWD) and potential changes to the permit.
- The Regional Board received the ROWD on August 25, 2005.
- On September 14, 2005, the Regional Board held a public workshop to inform Regional Board members of the principal issues facing permit re-issuance and allow interested parties to address the Regional Board on permit issues.
- On December 14, 2005, the Regional Board held a workshop on the requirements for fiscal assurances in municipal separate storm sewer system (MS4) permits in the San Diego Region.
- On March 10, 2006, the Regional Board released the Tentative Order and supporting Fact Sheet, beginning the public comment period.
- On April 26, 2006, the Regional Board held a workshop on the requirements of the Tentative Order.
- On May 24, 2006, the Regional Board held a workshop on the requirements of the Tentative Order.
- On June 21, 2006, the Regional Board held a public hearing on the requirements of the Tentative Order.
- On August 30, 2006, the Regional Board released a revised Tentative Order and supporting Fact Sheet, as well as a Responses to Comments document.
- Until October 30, 2006, the Regional Board accepted written comments on the revised Tentative Order.
- On December 4, 2006, the Regional Board released a second revised Tentative Order and supporting Fact Sheet, as well as a Responses to Comments II document (all dated December 13, 2006). Starting December 15, 2006, the Regional Board accepted comments on revisions made in the second revised Tentative Order.
- On January 15, 2007, the Regional Board released a third revised Tentative Order and supporting Fact Sheet, as well as a Responses to Comments III document (all dated January 24, 2007).
- On January 24, 2007, the Regional Board accepted oral comments on all revisions made to the Tentative Order following the June 21, 2006 public hearing.
- On January 24, 2007, the Regional Board adopted Order No. R9-2007-0001.

V. BACKGROUND

The federal Clean Water Act (CWA) was amended in 1987 to address urban runoff. One requirement of the amendment was that many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of urban runoff from their MS4s. In response to the CWA amendment (and the pending federal NPDES regulations which would implement the amendment), the Regional Board issued a municipal storm water permit, Order No. 90-42, in July 1990 to the Copermittees for their urban runoff discharges.[1]

Five years after adoption, Order No. 90-42 was due for renewal in July 1995, but was administratively extended pursuant to federal law because of limited Regional Board resources. Two formal drafts of the renewal permit were released to the public (in 1995 and 1998

[1] The San Diego County Regional Airport Authority was not added as a Copermittee until 2003, at the time when it separated from the San Diego Unified Port District.

respectively) and substantial written public comments on the drafts were considered by the Regional Board. In addition, the Regional Board convened a working group of Copermittees and stakeholders in 1997 and 1998 to advise the Regional Board on permit renewal issues. Despite the efforts by the public, the stakeholder group, and Regional Board, and in part due to the concurrent issuance and appeal of three other municipal storm water permits, Order No. 90-42 was not reissued by the Regional Board until February 21, 2001 as Order No. 2001-01.

The regulatory approach incorporated into Order No. 2001-01 was a significant departure from the regulatory approach of Order No. 90-42. Where Order No. 90-42 included broad nonspecific requirements in order to provide the Copermittees with the maximum amount of flexibility in implementing their programs, Order No. 2001-01 utilized detailed specific requirements which outlined the minimum level of implementation required for the Copermittees' programs. The shift in permitting approaches from Order No. 90-42 to Order No. 2001-01 resulted from the Regional Board's conclusion that the lack of specificity in Order No. 90-42 resulted in frequently unenforceable permit requirements, which in turn allowed some Copermittees to only make limited progress in implementing their programs.

Partially due to this shift in regulatory approaches, as well as new categories of permit requirements, the adoption process for Order No. 2001-01 generated extensive interest. Over 1,500 public comments were received on the Order, though many were duplicative. In addition, five public workshops were held covering various aspects of the Order. Following this extensive public participation process, the Regional Board adopted Order No. 2001-01 on February 21, 2001.

Subsequently, Order No. 2001-01 was administratively appealed to the State Water Resources Control Board (SWRCB) in March 2001 by the Building Industry Association of San Diego County (BIA) and the Western States Petroleum Association (WSPA). BIA utilized an across-the-board approach to its appeal, challenging a wide range of requirements included in the Order, while WSPA challenged the Order's legality in requiring treatment of runoff from retail gasoline outlets. In Order No. 2001-15, the SWRCB upheld the vast majority of the Order's requirements challenged by BIA, making insignificant alterations for clarification purposes to three of the Order's requirements. The SWRCB ruled in favor of WSPA, however, determining that the Regional Board had not adequately supported its position regarding retail gasoline outlets in the order's findings and fact sheet.

BIA continued its challenge of the Order in the Superior Court of the State of California, San Diego County in 2002. At that time, BIA was joined by several building industry and other groups, as well as the City of Santee and the City of San Marcos. The Court ruled in favor of the Regional Board on all counts, with all requirements of the Order being upheld. In particular, the Court found that the Order's requirements had not been shown to be impracticable or unreasonable, including provisions requiring compliance with receiving water quality standards. The Court also found that the Regional Board is exempt from California Environmental Quality Act (CEQA) review when adopting municipal storm water permits.

Following the Superior Court decision, BIA, several building industry and other groups, and the City of San Marcos appealed to the State of California Court of Appeal, Fourth Appellate District. Again the Order was upheld on all counts, with the court making the primary finding that the Regional Board has the authority to require compliance with state water quality standards in storm water permits. BIA's final appeal was to the State of California Supreme Court, which declined to hear the issue in March 2005.

Since adoption of Order No. 2001-01, and despite the subsequent legal actions, the Copermittees' storm water programs have expanded dramatically. Audits of the Copermittees' programs exhibit that the Copermittees' jurisdictional programs are largely in compliance with the Order. Some of the efforts currently being conducted on a regular basis by the Copermittees, which were not conducted on a widespread basis prior to adoption of Order No. 2001-01, include: construction site storm water inspections, industrial and commercial facility storm water inspections, municipal facility storm water inspections, management of storm water quality from new development, development of best management practice requirements for existing development, and assessment of storm water program effectiveness.

However, when viewed relative to the magnitude of the urban runoff problem, enormous challenges remain, particularly regarding the management of urban runoff on a watershed level. Today, urban runoff continues to be the leading cause of water quality impairment in the San Diego Region. The Copermittees' monitoring data exhibits persistent exceedances of water quality objectives in most watersheds. Many watersheds also have urban runoff conditions that are frequently toxic to aquatic life. Bioassessment data from the watersheds further reflects these conditions, finding that macroinvertebrate communities in creeks have widespread Poor to Very Poor Index of Biotic Integrity ratings. Finally, the now too familiar "health advisory or beach closure" signs, which often result from high levels of bacteria in urban runoff, exhibit the continued threat to public health by urban runoff.

VI. PERMITTING APPROACH (PROGRAM INTEGRATION, FLEXIBILITY, AND DETAIL)

The Order contains an increased emphasis on urban runoff management on a watershed basis. This shift towards increased watershed urban runoff management is consistent with earlier planning efforts conducted by the Regional Board regarding reissuance of Order No. 2001-01.[2] It is also consistent with the Copermittees' ROWD.[3] There are several reasons for this shift in emphasis. First, it has been found that the Copermittees are generally doing an effective job at implementing their jurisdictional programs, while on the other hand, it has been found that the Copermittees' watershed programs need improvement. In addition, an emphasis on watersheds is necessary to shift the focus of the Copermittees from program implementation to water quality results. After over 15 years of Copermittee program implementation, it is critical that the Copermittees link their efforts with positive impacts on water quality. Addressing urban runoff management on a watershed scale focuses on water quality results by emphasizing the receiving waters within the watershed. The conditions of the receiving waters drive management actions, which in turn focus on the water quality problems of the receiving waters in each watershed.

Focusing on watershed implementation does not mean that the Copermittees must expend funds outside of their jurisdictions, however. Rather, the Copermittees within each watershed are expected to collaborate to develop a watershed strategy to address the high priority water quality problems within each watershed. They then have the option of implementing the strategy in the manner they find to be most effective. Each Copermittee can implement the strategy individually within its jurisdiction, or the Copermittees can group together to implement the strategy throughout the watershed as a group.

While the Order includes a new emphasis on addressing urban runoff on a watershed basis, the Order includes recognition of the importance of continued program implementation on

[2] Regional Board, 2004. San Diego County Municipal Storm Water Permit Reissuance Summary. P. 7.
[3] San Diego County Copermittees, 2005. Report of Waste Discharge. P. C-12.

jurisdictional and regional levels. The Order also acknowledges that jurisdictional, watershed, and regional efforts are not always mutually exclusive. For this reason, an attempt has been made to allow for the Copermittees' jurisdictional, watershed, and regional programs to integrate. In the Order, the watershed requirements serve as the mechanism for this program integration. Since jurisdictional and regional activities can also serve watershed purposes, such activities can be integrated into the Copermittees' watershed programs, provided the activities meet certain criteria. In this manner, the Copermittees' activities do not always need to distinguish between jurisdictional, watershed, and regional levels of implementation. Instead, they can be integrated on multiple levels.

Such opportunities for program integration inherently provide flexibility to the Copermittees in implementing their programs. Program integration can be expanded or minimized as the Copermittees see fit. For example, there is flexibility provided in determining the activities to be integrated and implemented in the watershed programs – watershed-based efforts, regional efforts, enhanced jurisdictional efforts, or a mixture of the three. Significant flexibility is also provided throughout other portions of the Order. Copermittees can choose the best management practices (BMPs) to be implemented, or required to be implemented, for development, construction, and existing development areas. Flexibility to determine which industrial or commercial sites are to be inspected is also provided to the Copermittees. Educational approaches are also to be determined by the Copermittees under the Order. Implementation of efforts on a regional basis is largely optional for the Copermittees as well. Significant leeway is also provided to the Copermittees in utilizing methods to assess the effectiveness of their various urban runoff management programs. This flexibility is further extended to the monitoring program requirements, which allow the Copermittees to develop monitoring approaches to several aspects of the monitoring program.

The challenge in drafting the Order is to provide the flexibility described above while ensuring that the Order is still enforceable. To achieve this, the Order frequently prescribes minimum measurable outcomes, while providing the Copermittees with flexibility in the approaches they use to meet those outcomes. Enforceability has been found to be a critical aspect of the Order. For example, the watershed requirements of Order No. 2001-01 were some of the most flexible requirements found in that Order. This lack of specificity in the watershed requirements resulted in disagreement about the adequacy of the Copermittees' watershed compliance efforts. On one hand, the Regional Board considered the Copermittees' watershed efforts to be inadequate because they would not result in a significant reduction in pollutant discharges. On the other hand, the Copermittees contended their watershed programs were adequate and in compliance with Order No. 2001-01, even after being notified by the Regional Board of needed improvements on multiple occasions spanning several years. This situation reflects a common outcome of flexible permit language. Such language can be unclear and unenforceable, and lead to implementation of inadequate programs.

To avoid these types of situations, a balance between flexibility and enforceability has been crafted into the Order. Minimum measurable outcomes are utilized to ensure the Order is enforceable, while the Copermittees are provided flexibility in deciding how they will implement their programs to meet the minimum measurable outcomes.

VII. ECONOMIC ISSUES

Economic discussions of urban runoff management programs tend to focus on costs incurred by municipalities in developing and implementing the programs. Understandably so, since these costs are significant. However, when considering the cost of implementing the urban runoff

programs, it is also important to consider the alternative costs incurred by not fully implementing the programs, as well as the benefits which result from program implementation.

It is very difficult to ascertain the true cost of implementation of the Copermittees' urban runoff management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[4] Despite these problems, efforts have been made to identify urban runoff management program costs, which can be helpful in understanding the costs of program implementation.

In 1999, United States Environmental Protection Agency (USEPA) reported on multiple studies it conducted to determine the cost of urban runoff management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. USEPA also studied 35 Phase I municipalities, finding costs to be similar to those anticipated for Phase II municipalities, at $9.08 per household annually.[5] The USEPA cost estimate for Phase I municipalities is valuable because it considers municipalities (including Orange County and cities) that are implementing programs similar to those required in San Diego.

A study on program cost was also conducted by the Los Angeles Regional Water Quality Control Board (LARWQCB), where program costs reported in the municipalities' annual reports were assessed. The LARWQCB estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. Since the Los Angeles County permit is very similar to Order No. 2001-01, this estimate is useful in assessing general program costs in San Diego County.

The SWRCB also recently commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study is current and includes an assessment of costs incurred by the City of Encinitas in implementing their program. Annual cost per household in the study ranged from $18-46, with the City of Encinitas representing the upper end of the range.[6] The cost of the City of Encinitas' program is understandable, given the city's coastal location, reliance on tourism, and consent decree with environmental groups regarding its program. For these reasons, as well as the general recognition the City of Encinitas receives for implementing a superior program, the city's program cost can be considered as the high end of the spectrum for Copermittee urban runoff management program costs.

It is important to note that reported program costs are not all attributable to compliance with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been implemented by municipalities. Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38% of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs were either pre-existing or resulted from enhancement of pre-exiting programs.[7] The County of Orange found that even lesser amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement

[4] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[5] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[6] SWRCB, 2005. NPDES Stormwater Cost Survey. P. ii.
[7] Ibid. P. 58.

the Drainage Area Management Plan, which is similar to the Jurisdictional Urban Runoff Management Program in the San Diego County MS4 permit, is less than 20% of the total budget. The remaining 80% is attributable to pre-existing programs.[8]

It is also important to acknowledge that the vast majority of costs that will be incurred as a result of implementing Order No. R9-2007-0001 are not new. Urban runoff management programs have been in place in San Diego County for over 15 years. Any increase in cost to the Copermittees will be incremental in nature. Moreover, since Order No. R9-2007-0001 "fine tunes" the requirements of Order No. 2001-01, these cost increases are expected to be modest.

Urban runoff management programs cannot be considered in terms of their costs only. The programs must also be viewed in terms of their value to the public. For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by USEPA to be $158-210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. The California State University, Sacramento study corroborates USEPA's estimates, reporting annual household willingness to pay for statewide clean water to be $180.[10] When viewed in comparison to household costs of existing urban runoff management programs, these household willingness to pay estimates exhibit that per household costs incurred by Copermittees to implement their urban runoff management programs remain reasonable.

Another important way to consider urban runoff management program costs is to consider the implementation cost in terms of costs incurred by not improving the programs. Urban runoff in southern California has been found to cause illness in people bathing near storm drains.[11] A study of south Huntington Beach and north Newport Beach found that an illness rate of about 0.8% among bathers at those beaches resulted in about $3 million annually in health-related expenses.[12] Extrapolation of such numbers to the wide range of beaches of San Diego County could result in huge expenses to the public.

Urban runoff and its impact on receiving waters also places a cost on tourism. In past years, San Diego was featured in the national press for its water quality problems.[13] Such news can have a negative impact on San Diego tourism, since polluted beaches are generally not attractive to tourists. According to a 1996 San Diego Association of Governments (SANDAG) Memorandum, the California Division of Tourism has estimated that each out-of-state visitor spends $101.00 a day. The memo goes on to state that based on projections from the California Department of Boating and Waterways, nearly $1.2 billion in direct revenue and $1.2 billion in indirect revenue is pumped into the San Diego area economy each year by out-of-state visitors.[14] The experience of Huntington Beach provides an example of the potential economic impact of poor water quality. Approximately 8 miles of Huntington Beach were closed for two months in the middle of summer of 1999, impacting beach visitation and the local economy.

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[8] County of Orange, 2000. A NPDES Annual Progress Report. P. 60. More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.
[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] SWRCB, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Haile, R.W., et al, 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.
[12] Los Angeles Times, May 2, 2005. Here's What Ocean Germs Cost You: A UC Irvine Study Tallies the Cost of Treatment and Lost Wages for Beachgoers Who Get Sick.
[13] Regional Board, 2001. Fact Sheet/Technical Report for SDRWQCB Order No. 2001-01. P. 8.
[14] San Diego Association of Governments, 1996. Memorandum: California Department of Boating and Waterways: Unpublished Survey Information Regarding Beach Use. Written to the Shoreline Erosion Committee.

Finally, it is important to consider the benefits of urban runoff management programs in conjunction with their costs. A recent study conducted by USC/UCLA assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles Region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[15] Costs are anticipated to be borne over many years – probably ten years at least. As can be seen, the benefits of the programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[16]

Additional discussion of economic issues can be found at section 3 of the Fact Sheet/Technical Report for SDRWQCB Order No. 2001-01, available at:

http://www.waterboards.ca.gov/sandiego/programs/sd_stormwater.html.

VIII. LEGAL AUTHORITY

The following statutes, regulations, and Water Quality Control Plans provide the basis for the requirements of Order No. R9-2007-0001: CWA, California Water Code (CWC), 40 CFR Parts 122, 123, 124 (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, Final Rule), Part II of 40 CFR Parts 9, 122, 123, and 124 (National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule), Water Quality Control Plan – Ocean Waters of California (California Ocean Plan), Water Quality Control Plan for the San Diego Basin (Basin Plan), 40 CFR 131Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule (California Toxics Rule), and the California Toxics Rule Implementation Plan.

The legal authority citations below generally apply to directives in Order No. R9-2007-0001, and provide the Regional Board with ample underlying authority to require each of the directives of Order No. R9-2007-0001. Legal authority citations are also provided with each permit section discussion in section X of this Fact Sheet/Technical Report.

CWA 402(p)(3)(B)(ii) – The CWA requires in section 402(p)(3)(B)(ii) that permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers."

CWA 402(p)(3)(B)(iii) – The CWA requires in section 402(p)(3)(B)(iii) that permits for discharges from municipal storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

40 CFR 122.26(d)(2)(i)(B,C,E, and F) – Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) provide that each Copermittee's permit application "shall consist of: (i) Adequate legal authority. A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the

[15] LARWQCB, 2004. Alternative Approaches to Stormwater Control.
[16] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

applicant at a minimum to: […] (B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; (C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water; […] (E) Require compliance with condition in ordinances, permits, contracts or orders; and (F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) – Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) provides that the Copermittee shall develop and implement a proposed management program which "shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. […] Proposed programs may impose controls on a system wide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. […] Proposed management programs shall describe priorities for implementing controls."

40 CFR 122.26(d)(2)(iv)(A - D) – Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from new development and significant redevelopment, construction, and commercial, residential, industrial, and municipal land uses or activities. Control of illicit discharges is also required.

CWC 13377 – CWC section 13377 provides that "Notwithstanding any other provision of this division, the state board or the regional boards shall, as required or authorized by the CWA, as amended, issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with anymore stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

Order No. R9-2007-0001 is an essential mechanism for achieving the water quality objectives that have been established for protecting the beneficial uses of the water resources in the San Diego Region portion of San Diego County. Federal NPDES regulation 40 CFR 122.44(d)(1) requires MS4 permits to include any requirements necessary to "achieve water quality standards established under CWA section 303, including State narrative criteria for water quality." The term "water quality standards" in this context refers to a water body's beneficial uses and the water quality objectives necessary to protect those beneficial uses, as established in the Basin Plan.

IX. FINDINGS DISCUSSION

The findings of the Order have been modified to reduce repetition in their discussions and address new requirements. Each finding of the Order is provided and discussed below. Additional discussion relative to the findings can be found in section X of the Fact Sheet, which provides discussions of the Order's directives.

A. Basis For The Order

Finding A.1: This Order is based on the federal CWA, the Porter-Cologne Water Quality Control Act (Division 7 of the CWC, commencing with Section 13000), applicable state and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the SWRCB, the Basin Plan, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

Discussion: In 1987, Congress established CWA Amendments to create requirements for storm water discharges under the NPDES program, which provides for permit systems to regulate the discharge of pollutants. Under the Porter-Cologne Water Quality Control Act, the SWRCB and Regional Water Quality Control Boards (Regional Boards) have primary responsibility for the coordination and control of water quality, including the authority to implement the CWA. Porter-Cologne (section 13240) directs the Regional Boards to set water quality objectives via adoption of Basin Plans that conform to all state policies for water quality control. As a means for achieving those water quality objectives, Porter-Cologne (section 13243) further authorizes the Regional Boards to establish waste discharge requirements (WDRs) to prohibit waste discharges in certain conditions or areas. Since 1990, the Regional Board has issued area-wide MS4 NPDES permits. The Order will renew Order No. 2001-01 to comply with the CWA and attain water quality objectives in the Basin Plan by limiting the contributions of pollutants conveyed by urban runoff. Further discussions of the legal authority associated with the prohibitions and directives of the Order are provided in section VIII this document.

Finding A.2: This Order renews NPDES Permit No. CAS0108758, which was first issued on July 16, 1990 (Order No. 90-42), and then renewed on February 21, 2001 (Order No. 2001-01). On August 25, 2005, in accordance with Order No. 2001-01, the County of San Diego, as the Principal Permittee, submitted a ROWD for renewal of their MS4 Permit.

Discussion: Supporting information discussing the topic of this finding can be found in section V of this document.

B. Regulated Parties

Finding No. B.1: Each of the Copermittees listed in Table 1 of the Order owns or operates a MS4, through which it discharges urban runoff into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Discussion: Section 402 of the CWA prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a NPDES permit. Though urban runoff comes from a diffuse source, it is discharged through MS4s, which are point sources under the CWA. Federal NPDES regulation 40 CFR 122.26(a) (iii) and (iv) provide that discharges from MS4s, which service medium or large populations greater than 100,000 or 250,000 respectively, shall be required to obtain a NPDES permit. Federal NPDES regulation 40 CFR 122.26(a)(v) also provides that a NPDES permit is required for "A [storm water] discharge which the Director, or in States with approved NPDES programs, either the Director or the USEPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States." Such sources

are then designated into the program. Please see Attachment 1 of the Fact Sheet/Technical Report for Regional Board Order No. 2001-01 for an explanation on NPDES municipal storm water permit coverage for each municipality.[17] The San Diego County Regional Airport Authority, designated a Copermittee in 2003, was previously a part of the San Diego Unified Port District and has an MS4 interrelated to other Copermittee MS4s.

Other small MS4s, such as those serving universities and military installations, also exist within the watersheds of San Diego County. While these MS4s are not subject to this Order, they are subject to the Phase II NPDES storm water regulations. Over time, these MS4s will be designated for coverage under the SWRCB's statewide general storm water permit for small MS4s.

C. Discharge Characteristics

Finding No. C.1: Urban runoff contains waste, as defined in the CWC, and pollutants that adversely affect the quality of waters of the State. The discharge of urban runoff from an MS4 is a "discharge of pollutants from a point source" into waters of the United States as defined in the CWA.

Discussion: Section 13050(d) of the CWC defines "waste" as "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal." 40 CFR 122.2 defines "point source" as "any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." 40 CFR 122.2 defines "discharge of a pollutant" as "Any addition of any pollutant or combination of pollutants to waters of the U.S. from any point source." Also, the justification for control of pollution into waters of the state can be found at CWC section 13260(a)(1). SWRCB Order WQ 2001-15 verifies that urban runoff contains waste.[18]

Finding C.2: The most common categories of pollutants in urban runoff include total suspended solids, sediment (due to anthropogenic activities); pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.

Discussion: The National Urban Runoff Program (NURP) study showed that heavy metals, organics, coliform bacteria, nutrients, oxygen demanding substances (e.g., decaying vegetation), and total suspended solids are found at relatively high levels in urban runoff.[19] It also found that MS4 discharges draining residential, commercial, and light industrial areas contain significant loadings of total suspended solids and other pollutants. The Basin Plan goes on to identify urban

[17] Regional Board, 2001. Fact Sheet/Technical Report for SDRWQCB Order No. 2001-01. Attachment 1.
[18] SWRCB, 2001. Order WQ 2001-15. In the Matter of Petitions of Building Industry Association of San Diego County and Western States Petroleum Association: For Review of Waster Discharge Requirements Order No. 2001-01 for Urban Runoff from San Diego County [NPDES No. CAS0108758] Issued by the Regional Board.
[19] Ibid.

runoff pollutants to include lawn and garden chemicals, household and automotive care products dumped or drained on streets, and sediment that erodes from construction sites.[20] In addition, the SWRCB Urban Runoff Technical Advisory Committee (TAC) finds that urban runoff pollutants include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, viruses, and pesticides.[21] Runoff that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through storm drain networks directly to the receiving waters of the San Diego Region.

Finding No. C.3: The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance.

Discussion: The 1992, 1994, and 1996 National Water Quality Inventory Reports to Congress prepared by USEPA showed a trend of impairment in the nation's waters from contaminated storm water and urban runoff.[22] The 1998 National Water Quality Inventory Report showed that urban runoff discharges affect 11% of rivers, 12% of lakes, and 28% of estuaries. The report states that ocean shoreline impairment due to urban runoff increased from 55% in 1996 to 63% in 1998. The report notes that urban runoff discharges are the leading source of pollution and the main factor in the degradation of surface water quality in California's coastal waters, rivers, and streams. Furthermore, the NURP study found that pollutant levels from illicit discharges were high enough to significantly degrade receiving water quality, and threaten aquatic life, wildlife, and human health.[23]

In addition, the Region's CWA section 303(d) list, which identifies water bodies with impaired beneficial uses within the region, also indicates that the impacts of urban runoff on receiving waters are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents which have been found at high levels within urban runoff by the regional storm water monitoring program.[24] Examples of constituents frequently responsible for beneficial use impairment include total and fecal coliform, heavy metals, and sediment; these constituents have been found at high levels in urban runoff both regionally and nationwide.[25,26]

Finding No. C.4: Pollutants in urban runoff can threaten human health. Human illnesses have been clearly linked to recreating near storm drains flowing to coastal waters. Also, urban runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

Discussion: A landmark study, conducted by the Santa Monica Bay Restoration Project, found that there was an increased occurrence of illness in people that swam in proximity to a flowing

[20] Regional Board, 1994. Water Quality Control Plan, San Diego Basin, Region 9. San Diego.
[21] SWRCB, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.
[22] USEPA, 2000. Quality of Our Nation's Waters: Summary of the National Water Quality Inventory 1998 Report to Congress – USEPA 841-S-00-001; Water Quality Conditions in the United States: Profile from the 1998 National Water Quality Inventory Report to Congress – USEPA 841-F-00-006.
[23] USEPA, 1993. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.
[24] County of San Diego, 2005. San Diego County Municipal Copermittees 2004-2005 Urban Runoff Monitoring.
[25] Ibid.
[26] USEPA, 1983. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.

storm drain.[27] Furthermore, urban runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may eventually be consumed by humans. Pollutants such as heavy metals and pesticides, which are commonly found in urban runoff, have been found to bioaccumulate and biomagnify in long-lived organisms at the higher trophic levels.[28] Since many aquatic species are utilized for human consumption, toxic substances accumulated in species' tissues can pose a significant threat to public health. USEPA supports this finding when it states, "As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such and lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans."[29]

Finding No. C.5: Urban runoff discharges from MS4s often contain pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters.

Discussion: The Copermittees' monitoring data exhibits frequent toxic conditions in urban runoff during storm events. For example, persistent toxicity has been observed at the Chollas Creek mass loading station and the Tijuana River mass loading station. The Chollas Creek and Sweetwater River mass loading stations were also identified as potential Toxicity Identification Evaluation (TIE) candidate sites based on toxicity to *Hyalella* and *Selenastrum,* respectively.[30] Moreover, a study of urban runoff samples from Chollas Creek, revealed toxic concentrations of organophospate pesticides and metals.[31] Also, a water quality data assessment conducted in Aliso Creek in Orange County showed that storm events caused varying degrees of mortality to test organisms.[32]

Finding No. C.6: The Copermittees discharge urban runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within ten of the eleven hydrologic units (watersheds) comprising the San Diego Region. Some of the receiving water bodies have been designated as impaired by the Regional Board and the USEPA in 2002 pursuant to CWA section 303(d).

Discussion: This finding identifies the Copermittees responsible for MS4 discharges in each watershed management area. The list is identical to Order No. 2001-01, with the addition of the San Diego County Regional Airport Authority added to the San Diego Bay Watershed Management Area.

The CWA Section 303(d) List of Impaired Waters, 2002 Update has been approved by the Regional Board, SWRCB, and USEPA. This 303(d) list identifies waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). As part of this listing process, states are required to prioritize waters/watersheds

[27] Haile, R.W., et al., 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.
[28] Abel, P.D, 1996. Water Pollution Biology.
[29] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. Washington D.C. EPA 833-R-00-002.
[30] Ibid., P. ES-16.
[31] Bay, Steven M., et al., 2001. Characterization of Stormwater Toxicants from an Urban Watershed to Freshwater and Marine Organisms. Southern California Coastal Water Research Project. Annual Report 1999-2000.
[32] Regional Board, 2002. Fact Sheet/Technical Report for Regional Board Order No. R9-2002-0001.

for future development of Total Maximum Daily Loads (TMDLs). The 303(d) Pollutants of Concern or Water Quality Effect in Table 2 of the Order have been summarized from the 2002 303(d) list which can be found in full on our website at:

http://www.waterboards.ca.gov/sandiego/programs/303dlist.html.

Finding No. C.7: The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for various urban runoff-related pollutants (diazinon, fecal coliform bacteria, total suspended solids, turbidity, metals, etc.) at various watershed monitoring stations. At some monitoring stations, such as Agua Hedionda, statistically significant upward trends in pollutant concentrations have been observed. Persistent toxicity has also been observed at some watershed monitoring stations. In addition, bioassessment data indicates that the majority of watersheds have Poor to Very Poor Index of Biotic Integrity ratings. In sum, the above findings indicate that urban runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in San Diego County.

Discussion: The Copermittees have submitted information indicating persistent wet weather constituents of concern in various waterbodies of fecal coliform, total suspended solids, turbidity, total dissolved solids, diazinon, copper, zinc, toxicity, ammonia, biochemical oxygen demand, chemical oxygen demand, phosphorus, chlorpyrifos, and malathion.[33] The Agua Hedionda mass loading station shows statistically significant trends of increasing chemical oxygen demand, total kjeldahl nitrogen, total phosphorus, total suspended solids, and turbidity.[34] Statistically significant increasing trends have also been observed in Tecolote Creek (arsenic) and Chollas Creek (nitrate and lead).[35] Persistent toxicity has been observed at the Chollas Creek mass loading station and the Tijuana River mass loading station. The Chollas Creek and Sweetwater River mass loading stations were identified as potential Toxicity Identification Evaluation (TIE) candidate sites based on toxicity to *Hyalella* and *Selenastrum,* respectively.[36] However, the toxicity was not consistent among events and relatively slight. Bioassessment data collected during the 2004-2005 year indicates that the majority of the watersheds have Poor to Very Poor Index of Biotic Integrity ratings.[37] The three sites that received Good and Very Good ratings were at reference sites in the Santa Margarita Watershed[38] and San Luis Rey Watershed.[39] In most of these watersheds, there are no other NPDES permits discharging to the creeks. The few NPDES permits in the watersheds are mainly for recycled water which only discharges occasionally during the rainy season. Because the water quality monitoring indicates exceedances of water quality standards and urban runoff is the main source of pollutants in the watersheds, it can be inferred that the urban runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in San Diego County.

Finding No. C.8: When natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and

[33] San Diego County Copermittees, 2005. Baseline Long-Term Effectiveness Assessment, San Diego Copermittees Jurisdictional Urban Runoff Management Program, Final Report. P. 2-24, Table 2-5.
[34] Ibid.
[35] Ibid.
[36] County of San Diego, 2005. San Diego County Municipal Copermittees 2004-2005 Urban Runoff Monitoring. P. ES-16.
[37] Ibid., P. ES-4 – ES-19.
[38] Ibid., P. 4-11.
[39] Ibid., P. ES-7.

infiltration abilities of the land are lost. Therefore, runoff leaving a developed urban area is significantly greater in runoff volume, velocity, peak flow rate, and duration than pre-development runoff from the same area. The increased volume, velocity, rate, and duration of runoff greatly accelerate the erosion of downstream natural channels. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 10% conversion from natural to impervious surfaces. The increased runoff characteristics from new development must be controlled to protect against increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

Finding No. C.9: Urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed urban area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality.

Discussion (C.8 and C.9): The Natural Resources Defense Council (NRDC) 1999 Report, "Stormwater Strategies, Community Responses to Runoff Pollution" identifies two main causes of the storm water pollution problem in urban areas. Both causes are directly related to development in urban and urbanizing areas:

1. Increased volume and velocity of surface runoff. There are three types of human-made impervious covers that increase the volume and velocity of runoff: (i) rooftop, (ii) transportation imperviousness, and (iii) non-porous (impervious) surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants.

2. The concentration of pollutants in the runoff. Certain industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in urban runoff. As human population density increases, it brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc.

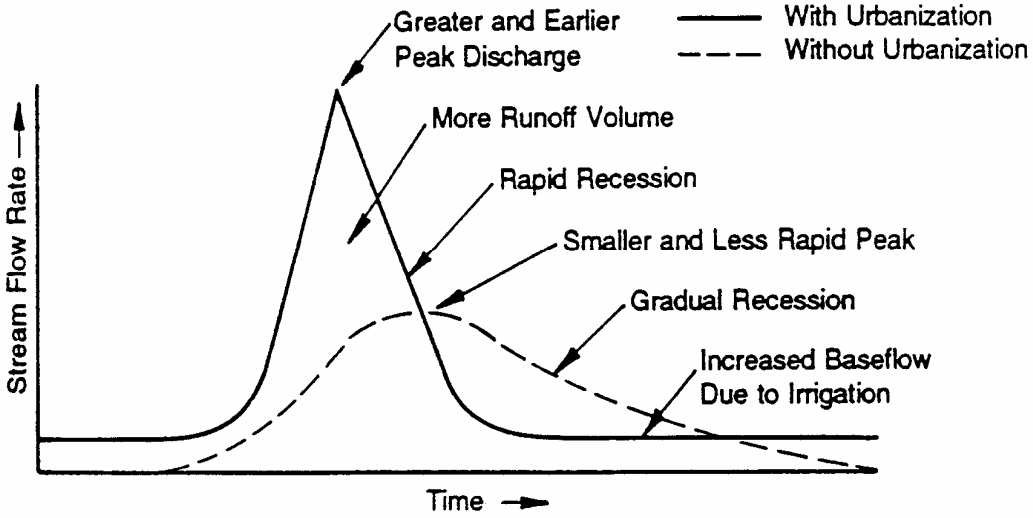
As a result of these two causes, runoff leaving developed urban areas is significantly greater in volume, velocity, and pollutant load than pre-development runoff from the same area.

Studies have shown that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[40] One comprehensive study, which looked at numerous areas, variables, and methods, revealed that stream degradation occurs at levels of imperviousness as low as 10 – 20%.[41] Stream degradation is a decline in the biological integrity and physical habitat conditions that are necessary to support natural biological diversity. For instance, few urban streams can support diverse benthic communities with imperviousness greater than or equal to

[40] USEPA, 1999. Part II. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. Federal Register.
[41] Ibid.

25%.[42] To provide some perspective, a medium density, single-family home area can be from 25% to 60% impervious (variation due to street and parking design).[43]

To demonstrate the principle of increased volume and velocity of runoff from urbanization, the following figure shows the flow rate of an urban vs. a natural stream. What the figure demonstrates is that urban stream flows have greater peaks and volumes, as well as shorter retention times than natural stream flows. The greater peak flows and volumes result in stream degradation through increased erosion of stream banks and damage to aquatic habitat. The shorter retention times result in less time for sediments and other pollutants to settle before being carried out to the ocean. This sediment, and the associated pollutants it carries, can be a significant cause of water quality degradation.



Source: Adapted from Schueler, 1997[44]

Increased volume and velocity of runoff adversely impacts receiving waters and their beneficial uses in many ways. According to the TAC report,[45] increases in population density and imperviousness result in changes to stream hydrology including:

1. Increased peak discharges compared to pre-development levels;
2. Increased volume of storm water runoff with each storm compared to pre-development levels;
3. Decreased travel time to reach receiving water; increased frequency and severity of floods;
4. Reduced stream flow during prolonged periods of dry weather due to reduced levels of infiltration;
5. Increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from channelization; and

[42] Ibid.
[43] Schueler, T.R., 1994. The Importance of Imperviousness. Watershed Protection Techniques. As cited in 64 Fed. Reg. 68725.
[44] Schueler, T.R., 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Metropolitan Washington Council of Governments.
[45] SWRCB, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

6. Decreased infiltration and diminished ground water recharge.

Even though the rainfall depths in arid watersheds are lower, watershed development can greatly increase peak discharge rates during rare flood events.[46] A study conducted in arid watersheds around Riverside, CA showed that, over two decades, impervious cover increased from 9% to 22%, which resulted in an increase of more than 100% in the peak flow rate for the two-year storm event. The study also showed that the average annual storm water runoff volume had increased by 115% to 130% over the same time span.[47]

Regarding the impact of urban development on urban runoff pollutant loads, the Regional Board's Basin Plan states:

> Nonpoint source pollution is primarily the result of man's uses of land such as urbanization, roads and highways, vehicles, agriculture, construction, industry, mineral extraction, physical habitat alteration (dredging/filling), hydromodification (diversion, impoundment, channelization), silviculture (logging), and other activities which disturb land.[48] As a result, when rain falls on and drains through urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. The pollutants can be dissolved in the runoff and quickly transported by gravity flow through a vast network of concrete channels and underground pipes referred to as storm water conveyance systems. Such systems ultimately discharge the polluted runoff, without treatment, into the nation's creeks, rivers, estuaries, bays, and oceans.[49]

According to the Center for Watershed Protection, the quality of both surface and ground water in urbanizing areas of arid and semi-arid regions of the southwest is strongly shaped by urbanization. Since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Therefore, the pollutant concentrations of storm water runoff from arid watersheds tends to be higher than that of humid watersheds.[50]

Finding No. C.10: Development and urbanization especially threaten environmentally sensitive areas (ESAs), such as water bodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species) and CWA 303(d) impaired water bodies. Such areas have a much lower capacity to withstand pollutant shocks than might be acceptable in the general circumstance. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particular sensitive environment. Therefore, additional control to reduce pollutants from new and existing development may be necessary for areas adjacent to or discharging directly to an ESA.

Discussion: ESAs are defined in the Order as "Areas that include but are not limited to all CWA Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the Basin Plan ; water bodies designated with the RARE beneficial use by the Basin Plan; areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees." Areas that

[46] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection. P. 695-706.
[47] Ibid.
[48] Regional Board, 1994. Water Quality Control Plan for the San Diego Basin. P. 4-66.
[49] Ibid. P. 4-69 - 4-70.
[50] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection. P. 695-706.

meet this definition are inherently sensitive habitats containing unique, rare, threatened, or endangered species, or are not achieving their designated beneficial uses. As discussed above, urban runoff is known to contain a wide range of pollutants and have demonstrated toxicity to plants and animals. Therefore, it is necessary to apply additional controls for developments within, adjacent to, or directly discharging to ESAs. This need for additional controls is addressed within each component of the Order. USEPA supports the requirement for additional controls, stating "For construction sites that discharge to receiving waters that do not support their designated use or other waters of special concern, additional construction site controls are probably warranted and should be strongly considered."[51] Further support for requiring additional controls to reduce pollutants in discharges to ESAs can be found in *Mitigation of Storm Water Impacts From New Developments in Environmentally Sensitive Areas*, a technical report written by the LARWQCB.[52]

Finding No. C.11: Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; (3) protecting footings and foundations; and (4) ensuring that each drainage feature is adequately maintained in perpetuity.

Discussion: Infiltration is an effective means for managing urban runoff. However, measures must be taken to protect groundwater quality when infiltration of urban runoff is implemented. USEPA supports urban runoff infiltration and provides guidance for protection of groundwater: "With a reasonable degree of site-specific design considerations to compensate for soil characteristics, infiltration may be very effective in controlling both urban runoff quality and quantity problems. This strategy encourages infiltration of urban runoff to replace the natural infiltration capacity lost through urbanization and to use the natural filtering and sorption capacity of soils to remove pollutants; however, the potential for some types of urban runoff to contaminate groundwater through infiltration requires some restrictions."[53] The restrictions placed on urban runoff infiltration in this Order are based on recommendations provided by the USEPA Risk Reduction Engineering Laboratory. The SWRCB found in Order WQ 2000-11 on the appeal of the LARWQCB's Standard Urban Storm Water Mitigation Plan (SUSMP) requirements that the guidance provided in the above referenced document by the USEPA Risk Reduction Engineering Laboratory is sufficient for the protection of groundwater quality from urban runoff infiltration. To further protect groundwater quality, the Order also includes guidance from the LARWQCB,[54] the State of Washington,[55] and the State of Maryland.[56]

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[51] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. Washington D.C. EPA/833-B-92-002.
[52] LARWQCB, 2001. Mitigation of Storm Water Impacts From New Developments In Environmentally Sensitive Areas.
[53] USEPA, 1994. Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration. EPA 600 SR-94 051.
[54] LARWQCB, 2000. Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles County.
[55] Washington State Department of Ecology, 1999. Draft Stormwater Management in Washington State. Volume V – Runoff Treatment BMPs. Pub. No. 99-15.
[56] Maryland Department of the Environment, 1999. 2000 Maryland Stormwater Design Manual. Volume I.

D. Urban Runoff Management Programs

Finding D.1.a: This Order specifies requirements necessary for the Copermittees to reduce the discharge of pollutants in urban runoff to the maximum extent practicable (MEP). However, since MEP is a dynamic performance standard which evolves over time as urban runoff management knowledge increases, the Copermittees' urban runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, best management practices, etc. Absent evidence to the contrary, this continual assessment, revision, and improvement of urban runoff management program implementation is expected to ultimately achieve compliance with water quality standards.

Discussion: Under CWA section 402(p), municipalities are required to reduce the discharge of pollutants from their MS4s to the maximum extent practicable (MEP). MEP is the critical technology-based performance standard that municipalities must attain. The MEP standard is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP. Reducing the discharge of storm water pollutants to the MEP requires Copermittees to assess each program component and revise activities, control measures, best management practices (BMPs), and measurable goals, as necessary to meet MEP.

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. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

1. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
2. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
3. Public Acceptance: Does the BMP have public support?
4. Cost: Will the cost of implementing the BMP have a reasonable relationship to he pollution control benefits to be achieved?
5. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?

If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive BMPs, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost is prohibitive, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP base solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented.[57]

[57] SWRCB, 1993. Memo Entitled Definition of Maximum Extent Practicable.

A definition of MEP is not provided in either the federal statute or in the federal regulations. The final determination regarding whether a municipality has reduced pollutants to the MEP can only be made by the Regional Board or the SWRCB, and not by the municipal discharger. While the Regional Board or the SWRCB ultimately define MEP, it is the responsibility of the Copermittees to initially propose actions that implement BMPs to reduce pollution to the MEP. In other words, the Copermittees' urban runoff management programs to be developed under the Order are the Copermittees' proposals of MEP. Their total collective and individual activities conducted pursuant to their urban runoff management programs become their proposal for MEP as it applies both to their overall effort, as well as to specific activities. The Order provides a minimum framework to guide the Copermittees in meeting the MEP standard.

It is the Regional Board's responsibility to evaluate the proposed programs and specific BMPs to determine what constitutes MEP, using the above guidance and the court's 1994 decision in NRDC v. California Department of Transportation, Federal District Court, Central District of California. The federal court stated that a Copermittee must evaluate and implement BMPs except where (1) other effective BMPs will achieve greater or substantially similar pollution control benefits; (2) the BMP is not technically feasible; or (3) the cost of BMP implementation greatly outweighs the pollution control benefits. In the absence of a proposal acceptable to the Regional Board, the Regional Board will define MEP by requiring implementation of additional measures by the Copermittees.

The Copermittees' continual evolution in meeting the MEP standard is expected to achieve compliance with water quality standards. USEPA has consistently supported this expectation. In its Interim Permitting Approach for Water Quality-Based Effluent Limitations (WQBELs) in Storm Water Permits, USEPA states "the interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for attainment of water quality standards."[58] USEPA reiterated its position in 1999, when it stated regarding the Phase II municipal storm water regulations that "successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards" and "EPA anticipates that a permit for a regulated small MS4 operator implementing BMPs to satisfy the six minimum control measures will be sufficiently stringent to protect water quality, including water quality standards […]."[59]

Finding D.1.b: Although the Copermittees have generally been implementing the jurisdictional urban runoff management programs required pursuant to Order No. 2001-01 since February 21, 2002, urban runoff discharges continue to cause or contribute to violations of water quality standards. This Order contains new or modified requirements that are necessary to improve Copermittees' efforts to reduce the discharge of pollutants in urban runoff to the MEP and achieve water quality standards. Some of the new or modified requirements, such as the expanded Watershed Urban Runoff Management Program section, are designed to specifically address these high priority water quality problems. Other new or modified requirements address program deficiencies that have been noted during audits, report reviews, and other Regional Board compliance assessment activities.

Discussion: The Copermittees are required to update and expand their urban runoff management programs on jurisdictional, watershed, and regional levels in order to improve their efforts to reduce the contribution of pollutants in urban runoff to the MEP and meet water quality

[58] Federal Register / Vol. 61, No. 166 / August 26, 1996 / P. 43761.
[59] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68753-68754.

standards. Changes to Order No. 2001-01's requirements have been made to help ensure these two standards are achieved by the Copermittees.

The jurisdictional requirements of the Order have been changed based on findings by the Regional Board during typical compliance assurance activities. The Regional Board performed full jurisdictional program audits of 20 of the 21 Copermittees during the Order No. 2001-01 permit term; it also performed detailed audits on 10 of the Copermittees' SUSMP programs. Where the audits found common implementation problems, requirements have been altered to better ensure compliance. In addition, the Regional Board conducted detailed reviews of every jurisdictional annual report submitted by the Copermittees, including provision of specific comments to the Copermittees where improvements were found to be needed. Again, where common reporting issues were found, the Order's requirements have been changed to rectify the issues. Other changes to jurisdictional requirements were based on Regional Board inspection findings or receipt of complaints.[60]

To better focus on attainment of water quality standards, the Order's watershed requirements have been improved. Addressing urban runoff management on a watershed scale focuses on water quality results by emphasizing the receiving waters within the watershed. The conditions of the receiving waters drive management actions, which in turn focus on the water quality problems of the receiving waters each watershed. Improvements to watershed requirements were also made to facilitate better understanding of the requirements between the Regional Board and Copermittees.

Finally, many of the required updates to the Copermittees' programs are based on recommendations found in the Copermittees' ROWD.[61]

Finding D.1.c: Updated Jurisdictional Urban Runoff Management Plans (JURMPs) and Watershed Urban Runoff Management Plans (WURMPs), and a new Regional Urban Runoff Management Plan (RURMP), which describe the Copermittees' urban runoff management programs in their entirety, are needed to guide the Copermittees' urban runoff management efforts and aid the Copermittees in tracking urban runoff management program implementation. It is practicable for the Copermittees to update the JURMPs and WURMPs, and create the RURMP, within one year, since significant efforts to develop these programs have already occurred.

Discussion: While development and submittal of urban runoff management plans are not necessary to ensure compliance of the Copermittees' urban runoff management programs with the Order, the plans do serve as useful correspondence between the Copermittees and the Regional Board. The plans help organize the Copermittees' programs and guide their implementation, while also providing the Regional Board with a means to track Copermittee implementation.

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. Implementation by the Copermittees of programs in compliance with the Order's requirements, prohibitions, and receiving water limits is the pertinent compliance standard to be used under the

[60] Audit reports, report reviews, and inspection reports are available for review at the Regional Board office.
[61] All significant changes made to the Order's requirements are described and explained in detail in Fact Sheet section X.

Order, as opposed to assessing compliance by reviewing the Copermittees' implementation of their plans alone.

Rather than being substantive components of the Order itself, the Copermittees' urban runoff management plans are simply descriptions of their urban runoff management programs required under the Order. These plans serve as procedural correspondence which guides program implementation and aids the Copermittees and Regional Board in tracking implementation of the programs. In this manner, the plans are not functional equivalents of the Order. For these reasons, the Copermittees' urban runoff management plans need not be an enforceable part of the Order.

The Copermittees' plans and programs can be updated within one year because much of their plans and programs are already in existence. In fact, many parts of their plans and programs have been in place for 15 years.[62] Moreover, the adoption of Order No. 2001-01 required a larger scale reorganization of the Copermittees' programs than Order No. R9-2007-0001, but also allowed one year for program updates. The Copermittees were able to meet the time schedule required under Order No. 2001-01.

Finding D.1.d: Pollutants can be effectively reduced in urban runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control BMPs remove pollutants from urban runoff.

Discussion: The SWRCB finds in its Order WQ 98-01 that BMPs are effective in reducing pollutants in urban runoff, stating that "implementation of BMPs [is] generally the most appropriate form of effluent limitations when designed to satisfy technology requirements, including reduction of pollutants to the maximum extent practicable." A SWRCB TAC further supports this finding by recommending "that nonpoint source pollution control can be accomplished most effectively by giving priority to [BMPs] in the following order:

1. Pollution Prevention – implementation of practices that use or promote pollution free alternatives;
2. Source Control – implementation of control measures that focus on preventing or minimizing urban runoff from contacting pollution sources;
3. Treatment Control – implementation of practices that require treatment of polluted runoff either onsite or offsite."[63]

Pollution prevention, the reduction or elimination of pollutant generation at its source, is an essential aspect of BMP implementation. By limiting the generation of pollutants by urban activities, less pollutants are available to be washed from urban areas, resulting in reduced pollutant loads in storm water discharges from these areas. In addition, there is no need to control or treat pollutants that are not initially generated. Furthermore, pollution prevention BMPs are

[62] Regional Board, 2000. Comparison Between the Requirements of Tentative Order 2001-01, the Federal NPDES Storm Water Regulations, the Existing San Diego Municipal Storm Water Permit (Order 90-42), and Previous Drafts of the San Diego Municipal Storm Water Permit.

[63] SWRCB, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media.[64]

In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. CWC section 13263.3(a) also supports pollution prevention, stating "The Legislature finds and declares that pollution prevention should be the first step in a hierarchy for reducing pollution and managing wastes, and to achieve environmental stewardship for society. The Legislature also finds and declares that pollution prevention is necessary to support the federal goal of zero discharge of pollutants into navigable waters." Finally, the Basin Plan also supports this finding by stating "To eliminate pollutants in storm water, one can either clean it up by removing pollutants or prevent it from becoming polluted in the first place. Because of the overwhelming volume of storm water and the enormous costs associated with pollutant removal, pollution prevention is the only approach that makes sense."[65]

USEPA also supports the utilization of a combination of BMPs to address pollutants in urban runoff. For example, USEPA has found there has been success in addressing illicit discharge related problems through BMP initiatives like storm drain stenciling and recycling programs, including household hazardous waste special collection days.[66] Structural BMP performance data has also been compiled and summarized by USEPA.[67] This data indicates that structural BMPs can be effective in reducing pollutants in urban runoff discharges. The summary provides the performance ranges of various types of structural BMPs for removing suspended solids, nutrients, pathogens, and metals from storm water flows. These pollutants are in general pollutants of concern in storm water in the San Diego Region. For suspended solids, the least effective structural BMP type was found to remove 30-65% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For nutrients, the least effective structural BMP type was found to remove 15-45% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For pathogens, the least effective structural BMP type was found to remove <30% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For metals, the least effective structural BMP type was found to remove 15-45% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load.

Finding D.1.e: Urban runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of pollutants to the MEP and protect receiving waters. Development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in urban runoff to receiving waters.

Discussion: MS4 permits are issued to municipalities because of their land use authority. The ultimate responsibility for the pollutant discharges, increased runoff, and inevitable long-term

[64] Schueler, T.R.., 2000. Center for Watershed Protection. Assessing the Potential for Urban Watershed Restoration, Article 142.
[65] Regional Board, 1994. Water Quality Control Plan, San Diego Basin, Region 9.
[66] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68728.
[67] USEPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA 821-R-99-012.

water quality degradation that results from urbanization lies with local governments. This responsibility is based on the fact that it is the local governments that have authorized the urbanization (i.e., conversion of natural pervious ground cover to impervious urban surfaces) and the land uses that generate the pollutants and runoff. Furthermore, the MS4 through which the pollutants and increased flows are conveyed, and ultimately discharged into natural receiving waters, are owned and operated by the same local governments. In summary, the Copermittees under the Order are responsible for discharges into and out of their MS4s because (1) they own and operate the MS4; and (2) they have the legal authority that authorizes the very development and land uses with generate the pollutants and increased flows in the first place.

For example, since grading cannot commence prior to the issuance of a local grading permit, the Copermittees have a built-in mechanism to ensure that all grading activities are protective of receiving water quality. The Copermittee has the authority to withhold issuance of the grading permit until the project proponent has demonstrated to the satisfaction of the Copermittee that the project will not violate their ordinances or cause the Copermittee to be in violation of its MS4 permit. Since the Copermittee will ultimately be held responsible for any discharges from the grading project by the Regional Board, the Copermittee will want to use its own permitting authority to ensure that whatever measures the Copermittee deems necessary to protect discharges into its MS4 are in fact taken by the project proponent.

The Order holds the local government accountable for this direct link between its land use decisions and water quality degradation. The Order recognizes that each of the three major stages in the urbanization process (development planning, construction, and the use or operational stage) are controlled by and must be authorized by the local government. Accordingly, this permit requires the local government to implement, or require others to implement, appropriate best management practices to reduce pollutant discharges and increased flow during each of the three stages of urbanization.

Including plans for BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce urban runoff pollutant loads to surface waters.[68] The Phase II regulations for small municipalities reflect the necessity of addressing urban runoff during the early planning phase. Due to the greater water quality concerns generally experienced by larger municipalities, Phase II requirements for small municipalities are also applicable to larger municipalities such as the Copermittees. The Phase II regulations direct municipalities to develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The program must ensure that controls are in place that would prevent or minimize water quality impacts. This includes developing and implementing strategies which include a combination of structural and/or non-structural BMPs appropriate to the locality. The program must also ensure the adequate long-term operation and maintenance of BMPs.[69] USEPA expands on the Phase II regulations for urban development when it recommends that Copermittees:

> "Adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement

[68] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[69] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68845.

> procedures. In developing your program, you should consider assessing existing ordinances, policies, programs and studies that address storm water runoff quality."

Management of urban runoff during the construction phase is also essential. USEPA explains in the preamble to the Phase II regulations that storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. Specifically, the biological, chemical and physical integrity of the waters may become severely compromised due to runoff from construction sites. Fine sediment from construction sites can adversely affect aquatic ecosystems by reducing light penetration, impeding sight-feeding, smothering benthic organisms, abrading gills and other sensitive structures, reducing habitat by clogging interstitial spaces within the streambed, and reducing intergravel dissolved oxygen by reducing the permeability of the bed material. Water quality impairment also results, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants, such as nutrients, metals, and organic compounds into aquatic systems.[70]

Finally, urban runoff from existing development must be addressed. The Copermittees' monitoring data exhibits that significant water quality problems exist in receiving waters which receive urban runoff from areas with extensive existing development, such as Chollas Creek.[71] Source identification, BMP requirements, inspections, and enforcement are all important measures which can be implemented to address urban runoff from existing development. USEPA supports inspections and enforcement by municipalities when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[72]

Finding D.1.f: Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Copermittees' programs.

Discussion: The annual reporting requirements are consistent with federal NPDES regulation 40 CFR 122.41, which states:

> "The operator of a large or medium municipal separate storm sewer system of a municipal separate storm sewer system that has been designated by the Director under section 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such a system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition, Such proposed changes shall be consistent with § 122.26(d)(2)iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions,. Inspections, and

[70] Ibid., 64 FR 68728.
[71] County of San Diego, 2005. San Diego County Municipal Copermittees 2004-2005 Urban Runoff Monitoring. Table 11-7.
[72] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

public education programs; and (7) Identification of water quality improvements or degradation."

CWC section 13267 provides that "the regional board may require that any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

The Regional Board must assess the reports to ensure that the Copermittees' programs are adequate to assess and address water quality. The reporting requirements can also be useful tools for the Copermittees to review, update, or revise their programs. Areas or issues which have received insufficient efforts can also be identified and improved upon.

Finding D.2.a: The SUSMP requirements contained in this Order are consistent with Order WQ-2000-11 adopted by the SWRCB on October 5, 2000. In the precedential order, the SWRCB found that the design standards, which essentially require that urban runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. The order also found that the SUSMP requirements are appropriately applied to the majority of the Priority Development Project categories contained in Section D.1 of this Order. The SWRCB also gave Regional Water Quality Control Boards the discretion to include additional categories and locations, such as retail gasoline outlets (RGOs), in future SUSMPs.

Discussion: The post-construction requirements and design standards contained in the SUSMP section of Order No. R9-2007-0001 constitute MEP and are consistent SWRCB guidance, court decisions, and Regional Board requirements. The SWRCB and Regional Boards have made several recent decisions in regards to inclusion of SUSMP requirements in MS4 permits. In a precedential decision, SWRCB WQ Order No. 2000-11, the SWRCB found that the SUSMP provisions constitute MEP for addressing pollutant discharges resulting from Priority Development Projects. The provisions of the SUSMP section of the Order are also consistent with those previously issued by the Regional Board for Orange County (Order No. R9-2002-0001) and San Diego County (Order No. 2001-01), as well as requirements in the Los Angeles County MS4 permit (Order No. R4-2001-182). In SWRCB Order WQ 2001-15, the SWRCB reaffirmed that SUSMP requirements constitute MEP. Moreover, the SUSMP requirements of the San Diego County MS4 permit (Order No. 2001-01) were upheld when the California State Supreme Court declined to hear the matter on appeal.

Finding D.2.b: Controlling urban runoff pollution before it enters the MS4 through the use of a combination of onsite source control BMPs augmented with treatment control BMPs is important for the following reasons: (1) Many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events. Whereas, onsite source control BMPs can be applied during all runoff conditions; (2) End-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; (3) End-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; (4) End-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the source and the BMP; and (5) Offsite end-of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

Discussion: Many end-of-pipe BMPs are designed for low flow conditions because their end-of-pipe location prevents them from being designed for large storm events. This results in the end-of-pipe BMPs being overwhelmed, bypassed, or ineffective during larger storm events more frequently than onsite BMPs designed for larger storms. BMPs are also frequently most effective for a particular type of pollutant (such as sediment). Such BMPs may be appropriate for small

sites with a limited suite of pollutants generated; however, end-of-pipe BMPs must typically be able to address a wide range of pollutants generated by a sub-watershed, limiting their effectiveness. Moreover, the location of some end-of-pipe BMPs allow for untreated pollutants to be discharged to and degrade receiving waters prior to their reaching the BMPs. This fails to protect receiving waters, which is the purpose of BMP implementation. Moreover, opportunities to educate the public regarding urban runoff pollution can be lost when end-of-pipe BMPs are located away from pollutant sources and out of sight. Onsite BMPs can lead to a better understanding of urban runoff issues since they demonstrate urban runoff processes.

Finding D.2.c: Use of site design BMPs at new development projects can be an effective means for minimizing the impact of urban runoff discharges from the development projects on receiving waters. Site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of urban runoff.

Discussion: The use of site design BMPs helps reduce the amount of impervious area associated with urbanization and allows storm water to infiltrate into the soil. Natural vegetation and soil filters urban runoff and reduces the volume and pollutant loads of storm water. Studies have revealed that the level of imperviousness resulting from urbanization is strongly correlated with the water quality impairment of nearby receiving waters.[73] In many cases the impacts on receiving waters due to changes in hydrology can be more significant than those attributable to the contaminants found in storm water discharges.[74] These impacts include stream bank erosion (increased sediment load and subsequent deposition), benthic habitat degradation, and decreased diversity of macroinvertebrates.

The Order include requirements for developments to include site design BMPs that mimic or replicate the natural hydrologic cycle. Open space designs which maximize pervious surfaces and retention of "natural" drainages have been found to reduce both the costs of development and pollutant export.[75] Moreover, USEPA finds including plans for a "natural" site design and BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce pollutant loads to surface waters.[76] In a review of the Copermittees' SUSMP programs, Tetra Tech found that many SUSMP projects were not including this effective BMP in their plans.[77]

Finding D.2.d: RGOs are significant sources of pollutants in urban runoff. RGOs are points of convergence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up and consequently produce significantly higher loadings of hydrocarbons and trace metals (including copper and zinc) than other urban areas. To meet MEP, source control and treatment control BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more, or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. These are appropriate thresholds since vehicular development size and volume of traffic are good indicators of potential impacts of urban runoff from RGOs on receiving waters.

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[73] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[74] Ibid.
[75] Center for Watershed Protection, 2000. "The Benefits of Better Site Design in Residential Subdivisions." Watershed Protection Techniques. Vol. 3. No. 2.
[76] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[77] Tetra Tech, 2005. San Diego Urban Storm Water Mitigation Plan Program Evaluation Report. Pages 4-5.

Discussion: RGOs are included in the Order as a Priority Development Project category because RGOs are points of confluence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up. RGOs consequently produce significantly greater loadings of hydrocarbons and trace metals (including copper and zinc) than other urban areas. To meet MEP, source control and structural treatment BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a ADT of 100 or more vehicles per day. These are appropriate thresholds since vehicular development size and volume of traffic are good indicators of potential impacts of urban runoff from RGOs on receiving waters.

This finding has been added to satisfy SWRCB WQ Order No. 2000-11's requirements for including RGOs as a Priority Development Category. Order No. 2000-11 acknowledged that a threshold (size, average daily traffic, etc.) appropriate to trigger SUSMP requirements should be developed for RGOs and that specific findings regarding RGOs should be included in MS4 permits to justify the requirement.[78] Additional detail to support the inclusion of RGOs can be found in Fact Sheet Section VIII.F.

Finding D.2.f: If not properly designed or maintained, certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design which avoids standing water can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities, local vector control agencies, and the State Department of Health Services during the development and implementation of urban runoff management programs.

Discussion: The implementation of certain structural BMPs or other urban runoff treatment systems can result in significant vector problems in the form of increased breeding or harborage habitat for mosquitoes, rodents or other potentially disease transmitting organisms. The implementation of BMPs that retain water may provide breeding habitat for a variety of mosquito species, some of which have the potential to transmit diseases such as Western Equine Encephalitis, St. Louis Encephalomyelitis, and malaria. Recent BMP implementation studies by Caltrans[79] in District 7 and District 11 have demonstrated mosquito breeding associated with some types of BMPs. The Caltrans BMP Retrofit Pilot study cited lack of maintenance and improper design as factors contributing to mosquito production. However, a Watershed Protection Techniques article[80] describes management techniques for selecting, designing, and maintaining structural treatment BMPs to minimize mosquito production. State and local urban runoff management programs that include structural BMPs with the potential to retain water have been implemented in Florida and the Chesapeake Bay region without resulting in significant public health threats from mosquitoes or other vectors.[81]

Finding D.3.a: In accordance with federal NPDES regulations, and to ensure the most effective oversight of industrial and construction site discharges, discharges of runoff from industrial and construction sites are subject to dual (state and local) storm water regulation. Under this dual system, the Regional Board is responsible for enforcing the General Construction Activities Storm Water Permit, SWRCB Order 97-03 DWQ, NPDES No. CAS000001 (General Construction Permit) and the General Industrial Activities Storm Water Permit, SWRCB Order

[78] SWRCB, 2000. Order WQ 2000-11.
[79] Caltrans, 2000. BMP Retrofit Pilot Studies: A Preliminary Assessment of Vector Production.
[80] Watershed Protection Techniques, 1995. Mosquitoes in Constructed Wetlands: A Management Bugaboo? 1(4):203-207.
[81] Shaver, E. and R. Baldwin , 1995. Sand Filter Design for Water Quality Treatment in Herricks, E., Ed. Stormwater Runoff and Receiving Systems: Impact, Monitoring, and Assessment, CRC Lewis Publishers, New York, NY.

99-08 DWQ, NPDES No. CAS000002 (General Industrial Permit), and each municipal Copermittee is responsible for enforcing its local permits, plans, and ordinances, which may require the implementation of additional BMPs than required under the statewide general permits.

Discussion: USEPA finds the control of pollutant discharges from industry and construction so important to receiving water quality that it has established a double system of regulation over industrial and construction sites. This double system of regulation consists of two parallel regulatory systems with the same common objective: to keep pollutants from industrial and construction sites out of the MS4. In this double system of regulation for runoff from industrial and construction sites, local governments must enforce their legal authorities (i.e., local ordinances and permits) while the Regional Board must enforce its legal authority (i.e., statewide general industrial and construction storm water permits). These two regulatory systems are designed to complement and support each other. Municipalities are not required to enforce Regional Board and SWRCB permits; however, they are required to enforce their ordinances and permits. The Federal regulations are clear that municipalities have responsibility to address runoff from industrial and construction sites which enters their MS4s.

Municipalities have this responsibility because they have the authority to issue land use and development permits. Since municipalities are the lead permitting authority for industrial land use and construction activities, they are also the lead for enforcement regarding runoff discharges from these sites. For sites where the municipality is the lead permitting authority, the Regional Board will work with the municipality and provide support where needed. The Regional Board will assist municipalities in enforcement against non-compliant sites after the municipality has exhibited a good faith effort to bring the site into compliance.

According to USEPA, the storm water regulations envision that NPDES permitting authorities and municipal operators will cooperate to develop programs to monitor and control pollutants in storm water discharges from industrial facilities.[82] USEPA discusses the "dual regulation" of construction sites in its Storm Water Phase II Compliance Assistance Guide,[83] which states "Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure […] is needed to induce more localized site regulation and enforcement efforts, and to enable operators […] to more effectively control construction site discharges into their MS4s." While the Storm Water Phase II Compliance Assistance Guide applies to small municipalities, it is applicable to the Copermittees, because they are similar in size and have the potential to discharge similar pollutant types as Phase II municipalities.

Finding D.3.b: Identification of sources of pollutants in urban runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Copermittees to ensure that discharges of pollutants into and from its MS4 are reduced to the MEP. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at high risk areas for pollutant discharges.

Discussion: Source identification is necessary to characterize the nature and extent of pollutants in discharges and to develop appropriate BMPs. It is the first step in a targeted approach to urban

[82] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[83] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

runoff management. Source identification helps identify the location of potential sources of pollutants in urban runoff. Pollutants found to be present in receiving waters can then be traced to the sites which frequently generate such pollutants. In this manner an inventories of sources can help in targeting inspections, monitoring, and potential enforcement. This allows for limited inspection, monitoring, and enforcement time to be most effective. USEPA supports source identification as a concept when it recommends construction, municipal, and industrial source identification in guidance and the federal regulations.[8485]

The development of BMPs for identified sources will help ensure that appropriate, consistent controls are implemented at all types of urban development and areas. Copermittees must reduce the discharge of pollutants in urban runoff to the maximum extent practicable. To achieve this level of pollutant reduction, BMPs must be implemented. Designation of minimum BMPs helps ensure that appropriate BMPs are implemented for various sources. These minimum BMPs also serve as guidance as to the level of water quality protection required. USEPA requires development and implementation of BMPs for construction, municipal, commercial, industrial, and residential sources at 40 CFR 122.26(d)(2)(iv)(A-D).

Updating ordinances and approval processes is necessary in order for the Copermittees to control discharges to their MS4s. USEPA supports updating ordinances and approval processes when it states "A crucial requirement of the NPDES storm water regulation is that a municipality must demonstrate that it has adequate legal authority to control the contribution of pollutants in storm water discharged to its MS4. […] In order to have an effective municipal storm water management program, a municipality must have adequate legal authority to control the contribution of pollutants to the MS4. […] 'Control,' in this context, means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4."[86]

Inspections provide a necessary means for the Copermittees to evaluate compliance of pollutant sources with their municipal ordinances and minimum BMP requirements. USEPA supports inspections when it recommends inspections of construction, municipal, and industrial sources.[87] Inspection of high risk sources are especially important because of the ability of frequent inspections to help ensure compliance, thereby reducing the risk associated with such sources. USEPA suggests that inspections can improve compliance when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations."[88]

Finding D.3.c: Historic and current development makes use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially modified features. In these cases, the urban stream is both an MS4 and receiving water.

Discussion: A MS4 is defined in the federal regulations as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs,

[84] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[85] 40 CFR 122.26(d)(2)(ii)
[86] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[87] Ibid.
[88] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

gutters, ditches, man-made channels, or storm drains), owned or operated by a Copermittee, and designed or used for collecting or conveying urban runoff.[89] Natural drainage patterns and urban streams are frequently used by municipalities to collect and convey urban runoff away from development within their jurisdiction. Therefore, the Regional Board considers natural drainages that are used for conveyances of urban runoff, regardless of whether or not they've been altered by the municipality, as both part of the MS4s and as receiving waters. To clarify, an unaltered natural drainage, which receives runoff from a point source (channeled by a Copermittee to drain an area within their jurisdiction), which then conveys the runoff to an altered natural drainage or a man-made MS4, is both an MS4 and a receiving water.[90]

Finding D.3.d: As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

Discussion: CWA section 402(p) requires operators of MS4s to prohibit non-storm water discharges into their MS4s. This is necessary because pollutants which enter the MS4 generally are conveyed through the MS4 to be eventually discharged into receiving waters. If a municipality does not prohibit non-storm water discharges, it is providing the pathway (its MS4) which enables pollutants to reach receiving waters. Since the municipality's storm water management service can result in pollutant discharges to receiving waters, the municipality must accept responsibility for the water quality consequences resulting from this service. Furthermore, third party discharges can cause a municipality to be out of compliance with its permit. Since pollutants from third parties which enter the MS4 will eventually be discharged from the MS4 to receiving waters, the third party discharges can result in a situation of municipality non-compliance if the discharges lead to an exceedance of water quality standards. For these reasons, each Copermittee must prohibit and/or control discharges from third parties to its MS4. USEPA supports this concept when it states "the operators of regulated small MS4s cannot passively receive and discharge pollutants from third parties" and "the operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts 'title' for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges to the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties."[91]

Finding D.3.e: Waste and pollutants which are deposited and accumulate in the MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed or treated. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges into the MS4s must be reduced to the MEP unless treatment within the MS4 occurs.

Discussion: When rain falls and drains urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. Gravity flow transports the pollutants to the MS4. Illicit discharges and connections also contribute a significant amount of pollutants to MS4s. MS4s are commonly designed to convey their contents as quickly as possible. Due to the

[89] USEPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.
[90] Regional Board, 2001. Response in Opposition to Petitions for Review of California Regional Water Quality Control Board San Diego Region Order No. 2001-01 – NPDES Permit No. CAS0108758 (San Diego Municipal Storm Water Permit).
[91] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68765-68766.

resulting typically high flow rates within the concrete conveyance systems of MS4s, pollutants which enter or are deposited in the MS4 and not removed are generally flushed unimpeded through the MS4 to waters of the United States. Since treatment generally does not occur within the MS4, in such cases reduction of pollutants to the MEP must occur prior to discharges entering the MS4.

The importance of this concept is supported by the tons of wastes/pollutants that have been removed from the Copermittees' MS4s as reported in their ROWD.[92] Moreover, these pollutants will be discharged into receiving waters unless an effective MS4 and structural treatment BMP maintenance program is implemented by the Copermittees. The requirement for Copermittees to conduct a MS4 maintenance program is specifically directed in both the Phase I and Phase II storm water regulations. Regarding MS4 cleaning, USEPA states "The removal of sediment, decaying debris, and highly polluted water from catch basins has aesthetic and water quality benefits, including reducing foul odors, reducing suspended solids, and reducing the load of oxygen-demanding substances that reach receiving waters."[93] It goes on to say, "Catch basin cleaning is an efficient and cost-effective method for preventing the transport of sediment and pollutants to receiving water bodies." USEPA also finds that "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices. […] The proposed program should provide for maintenance logs and identify specific maintenance activities for each class of control, such as removing sediment from retention ponds every five years, cleaning catch basins annually, and removing litter from channels twice a year."[94]

Finding D.3.f: Enforcement of local urban runoff related ordinances, permits, and plans is an essential component of every urban runoff management program and is specifically required in the federal storm water regulations and this Order. Each Copermittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water runoff, and for the allocation of funds for the capital, operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction.

Discussion: The Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A – D) are clear in placing responsibility on municipalities for control of urban runoff from third party activities and land uses to their MS4.[95] In order for municipalities to assume this responsibility, they must implement ordinances, permits, and plans addressing urban runoff from third parties. Assessments for compliance with their ordinances, permits, and plans are essential for a municipality to ensure that third parties are not causing the municipality to be in violation of its municipal storm water permit. When conditions of non-compliance are determined, enforcement is necessary to ensure that violations of municipality ordinances and permits are corrected. When the Copermittees determine a violation of its storm water ordinance, it must pursue correction of the violation. Without enforcement, third parties do not have incentive to correct violations. USEPA supports enforcement by municipalities when it states "Effective inspection and

[92] San Diego County Copermittees, 2005. Report of Waste Discharge. Pages 32-33.
[93] USEPA, 1999. Storm Water O&M Fact Sheet, Catch Basin Cleaning. EPA 832-F-99-011.
[94] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[95] USEPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.

enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[96]

Finding D.3.g: Education is an important aspect of every effective urban runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions impact receiving water quality and how these impacts can be minimized.

Discussion: Education is a critical BMP and an important aspect of the urban runoff management programs. USEPA finds that "An informed and knowledgeable community is critical to the success of a storm water management program since it helps ensure the following: Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important [and] greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."[97]

Regarding target audiences, USEPA also states "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children."

Finding D.3.h: Public participation during the development of urban runoff management programs is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

Discussion: This finding is supported by the Phase II Storm Water Regulations, which state "early and frequent public involvement can shorten implementation schedules and broaden public support for a program." USEPA goes on to explain, "public participation is likely to ensure a more successful storm water program by providing valuable expertise and a conduit to other programs and governments."[98]

Finding D.4.a: Since urban runoff does not recognize political boundaries, watershed-based urban runoff management can greatly enhance the protection of receiving waters within a watershed. Such management provides a means to focus on the most important water quality problems in each watershed. By focusing on the most important water quality problems, watershed efforts can maximize protection of beneficial use in an efficient manner. Watershed management of urban runoff does not require Copermittees to expend resources outside of their jurisdictions. Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy, which can then be implemented on a jurisdictional basis.

Discussion: In recent years, addressing water quality issues from a watershed perspective has increasingly gained attention. Regarding watershed-based permitting, the USEPA *Watershed-Based NPDES Permitting Policy Statement* issued on Jan. 7, 2004 states the following:

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[96] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA/833-B-92-002.
[97] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[98] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68755.

> USEPA continues to support a holistic watershed approach to water quality management. The process for developing and issuing NPDES permits on a watershed basis is an important tool in water quality management. USEPA believes that developing and issuing NPDES permits on a watershed basis can benefit all watershed stakeholders, from the NPDES permitting authority to local community members. A watershed-based approach to point source permitting under the NPDES program may serve as one innovative tool for achieving new efficiencies and environmental results. USEPA believes that watershed-based permitting can:
>
> - lead to more environmentally effective results;
> - emphasize measuring the effectiveness of targeted actions on improvements in water quality;
> - provide greater opportunities for trading and other market based approaches;
> - reduce the cost of improving the quality of the nation's waters;
> - foster more effective implementation of watershed plans, including total maximum daily loads (TMDLs); and
> - realize other ancillary benefits beyond those that have been achieved under the CWA (e.g., facilitate program integration including integration of Clean Water Act and Safe Drinking Water Act programs).
>
> Watershed-based permitting is a process that ultimately produces NPDES permits that are issued to point sources on a geographic or watershed basis. In establishing point source controls in a watershed-based permit, the permitting authority may focus on watershed goals, and consider multiple pollutant sources and stressors, including the level of nonpoint source control that is practicable. In general, there are numerous permitting mechanisms that may be used to develop and issue permits within a watershed approach.

This USEPA guidance is in line with SWRCB and Regional Board watershed management goals. For example, the SWRCB's TAC recommends watershed-based water quality protection, stating "Municipal permits should have watershed specific components." The TAC further recommends that "All NPDES permits and Waste Discharge Requirements should be considered for reissuance on a watershed basis."

In addition, the Basin Plan states that "public agencies and private organizations concerned with water resources have come to recognize that a comprehensive evaluation of pollutant contributions on a watershed scale is the only way to realistically assess cumulative impacts and formulate workable strategies to truly protect our water resources. Both water pollution and habitat degradation problems can best be solved by following a basin-wide approach."

In light of USEPA's policy statement and the SWRCB's and Regional Board's watershed management goals, the Regional Board seeks to expand watershed management in the regulation of urban runoff. Watershed-based MS4 permits can provide for more effective receiving water quality protection by focusing on specific water quality problems. The entire watershed for the receiving water can be assessed, allowing for critical areas and practices to be targeted for corrective actions. Known sources of pollutants of concern can be investigated for potential water quality impacts. Problem areas can then be addressed, leading to eventual improvements in receiving water quality. Management of urban runoff on a watershed basis allows for specific water quality problems to be targeted so that efforts result in maximized water quality improvements.[99]

[99] Regional Board, 2004. San Diego County Municipal Storm Water Permit Reissuance Analysis Summary. P. 1.

Finding D.4.b: Some urban runoff issues, such as residential education, can be effectively addressed on a regional basis. Regional approaches to urban runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs.

Discussion: Regional activities are generally directed at developing consistency between watershed and jurisdictional programs (e.g., through standards development), and collaborating on program activities such as education and monitoring to ease implementation and make the most of economies of scale. The Copermittees report having come to an understanding that jurisdictional, watershed, and regional programs cannot be effectively developed and implemented in isolation. In addition, the Copermittees, through WURMP implementation efforts, have learned that many watershed activities can be more effectively implemented (e.g., achieve more water quality benefits) at the regional level due to economies of scale and agree watershed protection should be increasingly emphasized as a focal point of Copermittee efforts under the re-issued Permit.[100]

Finding D.4.c: Both regionally and on a watershed basis, it is important for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially Caltrans, the Department of Defense, and Native American Tribes, is also important. Establishment of a management structure, within which the Copermittees subject to this Order will fund and coordinate those aspects of their joint obligations, will help promote implementation of urban runoff management programs on a watershed and regional basis in a most cost effective manner.

Discussion: Conventional planning and zoning can be limited in their ability to protect the environmental quality of creeks, rivers, and other waterbodies. Watershed-based planning is often ignored, despite the fact that receiving waters unite land by collecting runoff from throughout the watershed. Since watersheds unite land, they can be used as an effective basis for planning. Watershed-based planning enables local and regional areas to realize economic, social, and other benefits associated with growth, while conserving the resources needed to sustain such growth, including water quality. This type of planning can involve four steps: (1) Identify the watersheds shared by the participating jurisdictions; (2) Identify, assess, and prioritize the natural, social, and other resources in the watersheds; (3) Prioritize areas for growth, protection, and conservation, based on prioritized resources; and (4) Develop plans and regulations to guide growth and protect resources. Local governments have started with simple, yet effective, steps toward watershed planning, such as adopting a watershed-based planning approach, articulating the basic strategy in their General Plans, and beginning to pursue the basic strategy in collaboration with neighboring local governments who share the watersheds. Examples of new mechanisms created to facilitate watershed-based planning and zoning include the San Francisquito Creek Watershed Coordinated Resource Management Process and the Santa Clara Basin Watershed Management Initiative.[101]

E. Statute and Regulatory Considerations

Finding E.1: The Receiving Water Limitations (RWL) language specified in this Order is consistent with language recommended by USEPA and established in SWRCB Water Quality Order 99-05, adopted by the SWRCB on June 17, 1999. The RWL in this Order require

[100] San Diego County Copermittees, 2005. Report Of Waste Discharge. P. C.14.
[101] BASMAA, 1999. Start at the Source. Forbes Custom Publishing.

compliance with water quality standards through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Compliance with receiving water limits based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the creation of conditions of pollution.

Discussion: The RWLs in the Order require compliance with water quality standards through an iterative approach for implementing improved and better-tailored BMPs over time. The iterative BMP process requires the implementation of increasingly stringent BMPs until receiving water standards are achieved. This is necessary because implementation of BMPs alone cannot ensure attainment of receiving water quality standards. For example, a BMP that is effective in one situation may not be applicable in another. An iterative process of BMP development, implementation, and assessment is needed to promote consistent compliance with receiving water quality objectives. If assessment of a given BMP confirms that the BMP is ineffective, the iterative process should be restarted, with redevelopment of a new BMP that is anticipated to result in compliance with receiving water quality objectives.

The issue of whether storm water discharges from MS4s must meet water quality standards has been intensely debated in past years. The argument arises because CWA section 402(p) fails to clearly state that municipal dischargers of storm water must meet water quality standards. On the issue of industrial discharges of storm water, the statute clearly indicates that industrial dischargers must meet both (1) the technology-based standard of "best available technology economically achievable (BAT)" and (2) applicable water quality standards. On the issue of municipal discharges however, the statute states that municipal dischargers must meet (1) the technology-based standard of MEP" and (2) "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants." The statute fails, however, to specifically state that municipal dischargers must meet water quality standards.

As a result, the municipal storm water dischargers have argued that they do not have to meet water quality standards; and that they only are required to meet MEP. Environmental interest groups maintain that not only do MS4 discharges have to meet water quality standards, but that MS4 permits must also comply with numeric effluent limitations for the purpose of meeting water quality standards. On the issue of water quality standards, USEPA, the SWRCB, and the Regional Board have consistently maintained that MS4s must indeed comply with water quality standards. On the issue of whether water quality standards must be met by numeric effluent limits, USEPA, the SWRCB (in Orders WQ 91-03 and WQ 91-04), and the Regional Board have maintained that MS4 permits can, at this time, contain narrative requirements for the implementation of BMPs in place of numeric effluent limits.

In addition to relying on USEPA's legal opinion concluding that MS4s must meet MEP and water quality standards, the SWRCB also relied on the CWA's explicit authority for States to require "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants" in addition to the technology-based standard of MEP. To further support its conclusions that MS4 permit dischargers must meet water quality standards, the SWRCB relied on provisions of the CWC that specify that all waste discharge requirements must implement applicable Basin Plans and take into consideration the appropriate water quality objectives for the protection of beneficial uses.

The SWRCB first formally concluded that permits for MS4s must contain effluent limitations based on water quality standards in its Order WQ 91-03. In that Order, the SWRCB also concluded that it was appropriate for Regional Boards to achieve this result by requiring best

management practices, rather than by inserting numeric effluent limitations into MS4 permits. Later, in Order WQ 98-01, the SWRCB prescribed specific precedent setting Receiving Water Limitations language to be included in all future MS4 permits. This language specifically requires that MS4 dischargers meet water quality standards and allows for the use of narrative BMPs (increasing in stringency and implemented in an iterative process) as the mechanism by which water quality standards can be met.

In Order WQ 99-05, the SWRCB modified its receiving water limitations language in Order WQ 98-01 to meet specific objections by USEPA (the modifications resulted in stricter compliance with water quality standards). SWRCB Order WQ 99-05 states:

> "In Order WQ 98-01, the SWRCB ordered that certain receiving water limitation language be included in future municipal storm water permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Regional Boards for Vallejo and Riverside respectively, the USEPA objected to the permits. The USEPA objection was based on the receiving water limitation language. The USEPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.
>
> In light of USEPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the SWRCB is revising its instructions regarding receiving water limitation language for municipal storm water permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the USEPA language. Based on the reasons stated here, and as a precedent decision, the following receiving water limitation language shall be included in future municipal storm water permits."

In 1999 case involving MS4 permits issued by USEPA to several Arizona cities (*Defenders of Wildlife v. Browner*, 1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit upheld USEPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of USEPA's discretion rather than on the basis of strict compliance with the Clean Water Act. In other words, while holding that the Clean Water Act does not require all MS4 discharges to comply strictly with state water quality standards, the Court also held that USEPA has the authority to determine that ensuring strict compliance with state water quality standards is necessary to control pollutants. On the question of whether MS4 permits must contain numeric effluent limitations, the court upheld USEPA's use of iterative BMPs in place of numeric effluent limits.

On October 14, 1999, the SWRCB issued a legal opinion on the federal appellate decision and provided advice to the Regional Boards on how to proceed in the future. In the memorandum, the SWRCB concludes that the recent Ninth Circuit opinion upholds the discretion of USEPA and the State to (continue to) issue permits to MS4s that require compliance with water quality standards through iterative BMPs. Moreover, the memorandum states that "[…] because most MS4 discharges enter impaired water bodies, there is a real need for permits to include stringent requirements to protect those water bodies. As TMDLs are developed, it is likely that MS4s will have to participate in pollutant load reductions, and the MS4 permits are the most effective vehicles for those reductions." In summary, the SWRCB found that the Regional Boards should continue to include the RWL established in SWRCB Order WQ 99-05 in all future permits.

The issue of the RWLs language was also central to BIA's (and others') appeal of Order No. 2001-01 (Order No. R9-2007-0001 serves as the reissuance of Order No. 2001-01). BIA contended that the MEP standard was a ceiling on what could be required of the Copermittees in implementing their urban runoff management programs, and that Order No. 2001-01's receiving

water limitations requirements exceeded that ceiling. In other words, BIA argued that the Copermittees could not be required to comply with receiving water limitations if they necessitated efforts which went beyond the MEP standard. Again, the courts upheld the Regional Board's discretion to require compliance with water quality standards in municipal storm water permits, without limitation. The Court of Appeal, Fourth Appellate District found that the Regional Board has "the authority to include a permit provision requiring compliance with water quality standards."[102] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

While implementation of the iterative BMP process is a means to achieve compliance with water quality objectives, it does not shield the discharger from enforcement actions for continued non-compliance with water quality standards. Consistent with USEPA guidance,[103] regardless of whether or not an iterative process is being implemented, discharges that cause or contribute to a violation of water quality standards are in violation of Order No. R9-2007-0001.

Finding E.2: The Basin Plan identifies the following beneficial uses for water bodies in the Santa Diego County watersheds: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1) Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional beneficial uses are identified for coastal waters of San Diego County: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

Discussion: The San Diego County watersheds include all of Carlsbad, San Dieguito, Penasquitos, San Diego, Pueblo, Sweetwater, and Otay watersheds, and portions of Santa Margarita, San Luis Rey, and Tijuana watersheds. Major Rivers include the Santa Margarita River, the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River, Otay River and the Tijuana River. Major coastal waterbodies include Buena Vista Lagoon, Agua Hedionda Lagoon, Batiquitos Lagoon, San Elijo Lagoon, San Dieguito Lagoon, Los Penasquitos Lagoon, Mission Bay, San Diego Bay, Tijuana River estuary, and the Pacific Ocean. Major inland waterbodies include Lake Henshaw, Lake Wohlford, Lake Hodges, Sutherland Reservoir, Miramar Reservoir, San Vicente Reservoir, El Capitan Reservoir, Cuyamaca Reservoir, Sweetwater Reservoir, Loveland Reservoir, Otay Lakes, Barrett Lake and Morena Reservoir.

The San Diego County watersheds are approximately 2820 square miles and includes unincorporated portions of San Diego County, the Cities of Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista, as well as the San Diego Unified Port District and the San Diego County Regional Airport Authority, portions of the Cleveland National Forests, and the several Indian Reservations. Approximately 2.8 million people reside within the permitted area. Approximately 442 thousand people reside in the unincorporated area while the rest reside within the cities.

[102] Building Industry Association et al., v. State Water Resources Control Board, et al. 2004.
[103] USEPA, 1998. Jan. 21, 1998 correspondence, "SWRCB/OCC File A-1041 for Orange County," from Alexis Strauss to Walt Petit, and March 17, 1998 correspondence from Alexis Strauss to Walt Petit.

Finding E.3: This Order is in conformance with SWRCB Resolution No. 68-16 and the federal Antidegradation Policy described in 40 CFR 131.12.

Discussion: Urban runoff management programs are required to be designed to reduce pollutants in urban runoff to the maximum extent practicable and achieve compliance with water quality standards. Therefore, implementation of urban runoff management programs, which satisfy the requirements of Order No. R9-2007-0001, will prevent violations of receiving water quality standards. The Basin Plan states that "Water quality objectives must […] conform to US EPA regulations covering antidegradation (40 CFR 131.12) and State Board Resolution 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California." As a result, when water quality standards are met through the implementation of urban runoff management programs, USEPA and SWRCB antidegradation policy requirements are also met.

Finding E.4: Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This NPDES permit addresses the management measures required for the urban category, with the exception of septic systems. The adoption and implementation of this NPDES permit relieves the Permittee from developing a non-point source plan, for the urban category, under CZARA. The Regional Board addresses septic systems through the administration of other programs.

Discussion: Coastal states are required to develop programs to protect coastal waters from nonpoint source pollution, as mandated by the federal CZARA. CZARA Section 6217 identifies polluted runoff as a significant factor in coastal water degradation, and requires implementation of management measures and enforceable policies to restore and protect coastal waters. In lieu of developing a separate NPS program for the coastal zone, California's NPS Pollution Control Program was updated in 2000 to address the requirements of both the CWA section 319 and the CZARA section 6217 on a statewide basis. The California Coastal Commission (CCC), the SWRCB, and the nine Regional Water Quality Control Boards are the lead State agencies for upgrading the program, although 20 other State agencies also participate. Pursuant to the CZARA (6217(g) Guidance Document the development of urban runoff management programs pursuant to this NPDES permit fulfills the need for coastal cities to develop an urban runoff non-point source plan identified in the State's Non-point Source Program Strategy and Implementation Plan.[104]

Finding E.5: Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of impaired waterbodies known as Water Quality Limited Segments and to establish TMDLs for such waters. This priority list of impaired waterbodies is called the Section 303(d) List. The current Section 303(d) List was approved by the State Water Resources Control Board on February 4, 2003 and on July 25, 2003 by USEPA.

Discussion: Section 303(d) of the federal CWA (CWA, 33 USC 1250, et seq., at 1313(d)), requires States to identify waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). States are required to compile this information in a list and submit the list to USEPA for review and approval. This list

[104] SWRCB/CCC, 2000. Nonpoint Source Program Strategy And Implementation Plan, 1998-2013 (PROSIP).

is known as the Section 303(d) list of impaired waters. As part of this listing process, States are required to prioritize waters/watersheds for future development of TMDL. The SWRCB and Regional Boards have ongoing efforts to monitor and assess water quality, to prepare the Section 303(d) list, and to subsequently develop TMDLs. The 2002 California 303(d) List identifies impaired receiving water bodies and their watersheds within the State of California. Urban runoff that is discharged from the Copermittee's MS4s is a leading cause of receiving water quality impairment in the San Diego Region.

Finding E.6: This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on August 14, 2002 for diazinon in Chollas Creek by establishing WQBELs for the Cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, and the San Diego Unified Port District; and by requiring: 1) legal authority, 2) implementation of a diazinon toxicity control plan and a diazinon public outreach/ education program, 3) achievement of the Compliance Schedule, and 4) a monitoring program. The establishment of WQBELs expressed as iterative BMPs to achieve the WLA compliance schedule is appropriate and is expected to be sufficient to achieve the WLA specified in the TMDL.

Discussion: On August 14, 2002, the Regional Board adopted the TMDL Implementation Plan[105] for diazinon in Chollas Creek by establishing WQBELs for the Cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, and the San Diego Unified Port District. The adopted Implementation Plan states:

> "The Regional Board will revise existing waste discharge requirements / NPDES permits to incorporate effluent limitations in conformance with the Waste Load Allocations for diazinon as specified above. Modifications to the MS4 Permit can occur when the permit is reopened or during scheduled permit reissuance. Compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. The compliance schedule will be jointly developed by the Regional Board and the Chollas Creek stakeholders and will be finalized no later than one year following adoption of this TMDL by the Regional Board. The phased compliance schedule will apply only to attainment of numeric limitations for diazinon. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits."

On September 30, 2004, the compliance schedule was developed. The Order incorporates the compliance schedule. The TMDL Implementation Plan requires 1) Legal authority, 2) Implementation of a diazinon toxicity control plan and a diazinon public outreach / education program, 3) Achievement of the Compliance Schedule, and 4) Monitoring program. These requirements have been incorporated in the Order. The Implementation Plan states:

> "The municipal Copermittees in the Chollas Creek watershed shall implement the requirements of the MS4 Permit." And

> "The Regional Board will use its enforcement authority as necessary to ensure compliance with applicable waste discharge requirements and Basin Plan waste discharge prohibitions."

Finding E.7: This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on February 9, 2005 for dissolved copper in Shelter Island Yacht Basin (SIYB) by establishing WQBELs expressed as BMPs to achieve the WLA of 30 kg copper / year for the

[105] Regional Board, 2002. Basin Plan Amendment, Attachment A to Resolution No. R9-2002-0123, Chollas Creek Diazinon Total Maximum Daily Load. P. 6-8.

City of San Diego and the San Diego Unified Port District. The establishment of WQBELs expressed as BMPs is appropriate and is expected to be sufficient to achieve the WLA specified in the TMDL.

Discussion: On February 9, 2005, the Regional Board adopted the TMDL Implementation Plan[106] for dissolved copper in the SIYB by establishing WQBELs expressed as BMPs to achieve the WLAs for the San Diego Unified Port District and to a much lesser extent the City of San Diego. The TMDL Implementation Plan states:

> "The Regional Board will regulate discharges of copper to SIYB through the issuance of WDRs, Waivers of WDRs (waivers), or adoption of Waste Discharge prohibitions." And
>
> "The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm / Sewer Systems" to require that discharges of copper into SIYB waters via the City's municipal separate storm sewer system not exceed a 30 mg/kg wasteload for copper."

The Order is a WDR, therefore the discharge of copper to SIYB is regulated as required in the TMDL Implementation Plan. As stated in Finding A.2, the Order renews Order No. 2001-01, therefore the TMDL Implementation Plan requirements are included in this Order. The establishment of WQBELs expressed as BMPs is appropriate and is expected to be sufficient to achieve the WLAs specified in the TMDL.

Finding E.8: This Order establishes WQBELs and conditions consistent with the requirements and assumptions of the WLAs in the TMDLs as required by 40 CFR 122.44(d)(1)(vii)(B).

Discussion: The establishment of WQBELs expressed as iterative BMPs to achieve the WLA compliance schedule is appropriate and is expected to be sufficient to achieve the WLAs specified in the TMDL.

Finding E.9: Requirements in this Order that are more explicit than the federal storm water regulations in 40 CFR 122.26 are prescribed in accordance with the CWA section 402(p)(3)(iii) and are necessary to meet the MEP standard.

Discussion: The CWA explicitly preserves independent state authority to enact and implement its own standards and requirements, provided that such standards and requirements are at least as stringent as those that would be mandated by the CWA and the federal regulations. For example, as one general overriding principle, CWA section 510 states "nothing in this chapter shall (1) preclude or deny the right of any State or political subdivision thereof or interstate agency to adopt or enforce (A) any standard or limitation respecting discharges of pollutants, or (B) any requirement respecting control or abatement of pollution […]." When relating specifically to storm water, CWA section 402(p)(3)(B)(iii) clearly provides states with wide-ranging discretion, stating that municipal storm water permits "[s]hall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants"

[106] Regional Board, 2005. Basin Plan Amendment, Attachment A to Resolution No. R9-2005-0019, Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay. P. 5.

Therefore, where the Order contains requirements more specific than those included in the federal NPDES regulations 40 CFR 122.26(d), it is seeking to meet the above CWA requirements, as well as other particular federal NPDES regulations such as 40 CFR 122.44(d)(1)(i). This federal NPDES regulation requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." Given the continued impact of urban runoff on receiving waters within the San Diego region, increased specificity in municipal storm water permits is necessary to meet the above CWA and federal regulation requirements.

In a 1992 decision, the U.S. Court of Appeals for the Ninth Circuit (NRDC v. USEPA, 966 F.2d 1292) interpreted the language in Clean Water Act section 402(p)(3)(B)(iii) as providing the State with substantial discretion and authority: "[t]he language in (iii), above, requires the Administrator or the State to design controls. Congress did not mandate a minimum standards approach or specify that USEPA develop minimal performance requirements […] we must defer to USEPA on matters such as this, where USEPA has supplied a reasoned explanation of its choices." The decision in essence holds that USEPA and the States are authorized to require implementation of storm water control programs that, upon "reasoned explanation," accomplish the goals of CWA section 402(p). The Ninth Circuit Court of Appeals further reinforced the State's authority in this area more recently in 1999. In Defenders of Wildlife v. Browner (1999) Case No. 98-71080, the Court cited the language of CWA section 402(p)(3)(B)(iii) and stated "[t]hat provision gives the USEPA discretion to determine what pollution controls are appropriate. As this court stated in NRDC v. USEPA, 'Congress gave the administrator discretion to determine what controls are necessary […].'"

Furthermore, the increased specificity included in the Order is in line with USEPA guidance included in its *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems*[107] and its *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*.[108] Where the permit is more specific than the federal regulations, it is frequently based on the recommendations of the Guidance Manual. The Interim Permitting Approach also supports increased specificity in storm water permits, recommending that municipal storm water permits use BMPs in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate." It is important to note that the SWRCB cited USEPA's Interim Permitting Approach as support for its decision which upheld the increased specificity of numeric sizing criteria requirements for post-construction BMPs as appropriate requirements in municipal storm water permits.

Finding E.10: Urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the

[107] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[108] USEPA, 1996. Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. 61 FR 43761.

U.S. Authorizing the construction of an urban runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This is consistent with USEPA guidance to avoid locating structural controls in natural wetlands.

Discussion: Urban runoff treatment and/or mitigation in accordance with any of the requirements in the Order must occur prior to the discharge of storm water or urban runoff into receiving waters. Allowing polluted runoff to enter receiving waters prior to treatment to the MEP will result in degradation of the water body and potential exceedances of water quality standards, from the discharge point to the point of dissipation, infiltration, or treatment. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This requirement is supported by federal regulation 40 CFR 131.10(a) and USEPA guidance. According to USEPA,[109] "To the extent possible, municipalities should avoid locating structural controls in natural wetlands. Before considering siting of controls in a natural wetland, the municipality should demonstrate that it is not possible or practicable to construct them in sites that do not contain natural wetlands… Practices should be used that settle solids, regulate flow, and remove contaminants prior to discharging storm water into a wetland."

Finding E.11: Urban runoff is a significant contributor to the creation and persistence of Toxic Hot Spots in San Diego Bay. CWC section 13395 requires regional boards to reevaluate WDRs associated with toxic hot spots. The SWRCB adopted the Consolidated Toxic Hot Spot Cleanup Plan in June 1999. The Plan states: "The reevaluation [of WDRs associated with toxic hot spots] shall consist of (1) an assessment of the WDRs that may influence the creation or further pollution of the known toxic hot spot, (2) an assessment of which WDRs need to be modified to improve environmental conditions at the known toxic hot spot, and (3) a schedule for completion of any WDR modifications deemed appropriate."

Discussion: Toxic hot spots are those areas in enclosed bays, estuaries, or any adjacent waters in the "contiguous zone" or the "ocean", where pollution or contamination affects the interests of the state, and where hazardous substances have accumulated to levels which: 1) may pose a substantial present or potential hazard to aquatic life, wildlife, fisheries, or human health, or 2) may adversely affect the beneficial uses of the bay, estuary, or ocean waters, or 3) exceeds adopted water quality or sediment quality objectives. San Diego Bay contains several toxic hot spots. In a National Oceanic and Atmospheric Administration (NOAA) study which compared EMAP-type sediment toxicity data from various bays, San Diego Bay ranked second with 56 percent of the area of the Bay considered toxic. In addition to chemical and physical impacts, urban runoff often contains pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters. A study of urban runoff samples from Chollas Creek in San Diego County, revealed toxic concentrations of

[109] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

organophospate pesticides and metals.[110] In Los Angeles County, storm water samples were found to be toxic to various aquatic organisms in the Los Angeles River, the San Gabriel River, Ballona Creek, and the Santa Monica Bay.[111] Also, a water quality data assessment conducted in Aliso Creek in Orange County showed that storm events caused varying degrees of mortality to test organisms.[112] For these reasons, the Order includes directives to prevent urban runoff from contributing to the further degradation of toxic hot spots.

Finding E.12: The issuance of waste discharge requirements and an NPDES permit for the discharge of urban runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

Discussion: CWC Section 13389 exempts the adoption of waste discharge requirements (such as NPDES permits) from CEQA requirements: "Neither the state board nor the regional boards shall be required to comply with the provisions of Chapter 3 (commencing with section 21100) of Division 13 of the Public Resources Code prior to the adoption of any waste discharge requirement, except requirements for new sources as defined in the Federal Water Pollution Control Act or acts amendatory thereof or supplementary thereto."

This CEQA exemption was challenged during BIA's (and others') appeal of Order No. 2001-01 (Order No. R9-2007-0001 serves as the reissuance of Order No. 2001-01). BIA contended that the CEQA exemption did not apply to permit requirements where the Regional Board utilized its discretion to craft permit requirements which were more prescriptive than required by federal law. The Court of Appeal, Fourth Appellate District disagreed with this argument, stating "we also reject Building Industry's argument to the extent it contends the statutory CEQA exemption in Water Code section 13389 is inapplicable to a particular NPDES permit provision that is discretionary, rather than mandatory, under the CWA."[113] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

In a recent decision, the Court of Appeal of the State of California, Second Appellate District, upheld the CEQA exemption for municipal storm water NPDES permits (County of Los Angeles, et al. v. California State Water Resources Control Board, et al.).

F. Public Process

Finding F.1: The Regional Board has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an Order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of urban runoff.

Discussion: Public notification of development of a draft permit is required under Federal regulation 40 CFR 124.10(a)(1)(ii). This regulation states "(a) Scope. (1) The Director shall give public notice that the following actions have occurred: (ii) A draft permit has been prepared

[110] Bay, et al., 2001. Characterization of Stormwater Toxicants from an Urban Watershed to Freshwater and Marine Organisms. Southern California Coastal Water Research Project. Annual Report 1999-2000.
[111] LARWQCB, 2001. The Role of Municipal Operators In Controlling the Discharge of Pollutants in Storm Water from Industrial/Commercial Facilities: A Case for Inspection Activities in the Large and Medium Municipal Separate Storm Sewer Permits.
[112] Regional Board, 2002. Fact Sheet/Technical Report for Regional Board Order No. R9-2002-0001.
[113] Building Industry Association et al., v. State Water Resources Control Board, et al. 2004.

under Sec. 124.6(d)." Public notifications "shall allow at least 30 days for public comment," as required under Federal regulation 40 CFR 124.10(b)(1).

Finding F.2: The Regional Board has, at public meetings on (date), held public hearings and heard and considered all comments pertaining to the terms and conditions of this Order.

Discussion: Public hearings are required under CWC Section 13378, which states "Waste discharge requirements and dredged or fill material permits shall be adopted only after notice and any necessary hearing." Federal regulation 40 CFR 124.12(a)(1) also requires public hearings for draft permits, stating "The Director shall hold a public hearing whenever he or she finds, on the basis or requests, a significant degree of public interest in a draft permit(s)." Regarding public notice of a public hearing, Federal regulation 40 CFR 124.10(b)(2) states that "Public notice of a public hearing shall be given at least 30 days before the hearing."

X. DIRECTIVES DISCUSSION

This section discusses significant changes which have been made to the requirements of the Order from the requirements which were previously included in Order No. 2001-01. For each section of the Order than has been changed there is a discussion which describes the change that was made and provides the rationale for the change. In addition, comments on the Copermittees' ROWD recommendations, as they pertain to each changed requirement of the Order, are provided.

Requirements of the Order that are not discussed in this section have not been significantly changed from those requirements previously included in Order No. 2001-01. For such requirements, discussions and rationale for the requirements can be found in section VII of the Fact Sheet/Technical Report for Regional Board Order No. 2001-01, dated November 6, 2001. Section VII also provides additional background information for those requirements that have undergone significant change which are described in detail in this report. The Fact Sheet/Technical Report is available for download at:

http://www.waterboards.ca.gov/sandiego/programs/sd_stormwater.html

Legal authority citations are provided for each major section of the Order. These citations apply to all applicable requirements within the section for which they are provided.

A. Prohibitions and Receiving Water Limitations

The following legal authority applies to section A:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: The Regional Board Water Quality Control Plan for the San Diego Basin (Basin Plan) contains the following waste discharge prohibition: "The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in California Water Code Section 13050, is prohibited."

California Water Code section 13050(l) states "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination."

California Water Code section 13050(k) states "'Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

California Water Code section 13050(m) states "'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

California Water Code section 13241 requires each regional board to "establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance […]."

California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the Regional Board implement the Basin Plan.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges to their MS4.

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section A of the Order combines two previously distinct requirement sections – Prohibitions and RWLs. These sections have been combined into one section for organization purposes and to reduce redundancy, since both sections address the same issue. In addition, the prohibition specifically addressing post-development runoff has been removed from the Order since it reiterated other more broad prohibitions, making it redundant. These changes have no net effect on the implementation and enforcement of the Order.

B. Non-Storm Water Discharges

The following legal authority applies to section B:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittees shall prevent all types of illicit discharges into the MS4 except for certain non-storm water discharges.

Section B of the Order has been reworded to simplify and clarify the requirements for addressing non-storm water discharges that are not prohibited. This rewording has no net effect on the implementation and enforcement of the Order.

In their ROWD, the Copermittees recommend expanding the BMP exemption for emergency fire fighting flows so that it would apply to all emergency water flows. However, the Copermittees provide no information regarding what types of urban runoff are considered "emergency water flows." In addition, the level of pollutants in such flows is not discussed. Due to the lack of such information, the requirement regarding emergency fire fighting flows has not been changed.

C. Legal Authority

The following legal authority applies to section C:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Copermittees shall develop and implement legal authority to "Control through ordinance, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that the Copermittees shall develop and implement legal authority to "Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Illicit discharge is defined under Federal NPDES regulation 40 CFR 122.26(b)(2) as "any discharge to a municipal separate storm sewer system that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulation 40 CFR 122.26(d)(1)(ii) requires from the Copermittee "A description of existing legal authority to control discharges to the municipal separate storm sewer system."

Section C.1.j has been added to the Order to ensure that BMPs implemented by third parties are effective. Since the Copermittees cannot passively receive and discharge pollutants from third parties, the Copermittees must ensure discharges of pollutants to the MS4 are reduced to the MEP. In order to achieve this, the Copermittees must be able to ensure that effective BMPs are being implemented by requiring the third parties to document BMP effectiveness. Regarding the Copermittees' ability to require documentation and reporting from third parties, USEPA states "municipalities should provide documentation of their authority to enter, sample, inspect, review, and copy records, etc., as well as demonstrate their authority to require regular reports."[114]

Section C.2.d has been added to the Order to ensure that the Copermittees' enforcement tools are effective enough to ensure compliance with the Order. USEPA supports the need for the adequate Copermittee enforcement when it states that the Copermittees' general counsels "should state that the applicant has the legal authority to apply and enforce the requirements of 40 CFR 122.26(d)(2)(i)(A-F)."[115]

D. Jurisdictional Urban Runoff Management Program

D.1. Development Planning

The following legal authority applies to section D.1:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWA section 402(a), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 131.12, and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a proposed management program which is to include "A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed."

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Sections D.1.a and D.1.b (General Plan and Environmental Review Process) require the Copermittees to update and revise their General Plan (or equivalent plan) and environmental review processes to ensure water quality and watershed protection principles are included. The Copermittees are required to detail any changes to the General Plan or environmental review process in their Jurisdictional Urban Runoff Management Program Annual Reports.

[114] USEPA, 1992. Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[115] Ibid.

The change made to these sections, which requires updating the General Plan and Environmental Review Process on an as needed basis, is supported by information provided in the Copermittees' ROWD. The ROWD states that all Copermittees have either updated, are in the process of updating, or have assessed their General Plan to ensure the General Plans include the required principles and are in compliance with Order No. 2001-01. The ROWD also states that all the Copermittees have updated their environmental review processes.

Section D.1.c (Approval Process Criteria and Requirements) requires that all development projects (regardless of size) implement BMPs to reduce pollutant discharges to the MEP. Source control and site design BMP requirements were not clearly described in this section of Order No. 2001-01. Additional detail has been added to this section to better describe the source control and site design BMPs needed for implementation. This additional detail is consistent with the requirements of the Model SUSMP. However, only source control and site design BMPs that apply to all types of development projects are required (i.e., properly designed trash storage areas).

In addition, Order No. 2001-01's requirement that applicants must provide evidence of coverage under the General Industrial Permit has been removed. This requirement was difficult to implement since industrial tenants for a development project are usually not known during the planning stage.

Sections D.1.d and D.1.d.(1) (Standard Urban Storm Water Mitigation Plans) require the Copermittees to review and update their local SUSMPs for compliance with the Order. The sections also require all Priority Development Projects falling under certain categories to meet SUSMP requirements. The update is necessary to ensure that the Copermittees' local SUSMPs are consistent with the changes that have been made to the Order's SUSMP requirements. The requirement for the development/adoption of a Model SUSMP has been removed since a model was completed and adopted in 2002.

Section D.1.d.(2) (Priority Development Project Categories) has been changed to simplify and clarify the Priority Development Project categories. The two housing development categories were combined into one category that includes 10 or more housing units. In addition, requirements which specifically apply to restaurants have been combined in this section. The section has been modified to clarify that restaurants with less than 5,000 square feet of development are subject to SUSMP requirements, except for the treatment control BMP and hydromodification control requirements. This is consistent with Order No. 2001-01's approach for applying SUSMP requirements to restaurants.

Section D.1.d.(2)(i) includes Retail Gasoline Outlets (RGOs) as a Priority Development Project category because RGOs are points of confluence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up. RGOs consequently produce significantly greater pollutant loadings of hydrocarbons and trace metals (including copper and zinc) than other urban areas. To meet MEP, source control and structural treatment BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more of developed area, or (b) a projected ADT of 100 or more vehicles per day. These are appropriate thresholds since development size and volume of traffic are good indicators of potential impacts of urban runoff from RGOs on receiving waters.

In SWRCB WQ Order No. 2000-11, the SWRCB removed RGOs as a SUSMP category because the SWRCB found that RGOs were already heavily regulated and limited on their ability to construct infiltration devices or perform treatment. Order No. 2000-11 also acknowledged that a

threshold (size, average daily traffic, etc.) appropriate to trigger SUSMP requirements should be developed, and that specific findings regarding RGOs should be included in MS4 permits to justify the requirement.[116] The SWRCB also removed the RGO category from the San Diego County MS4 permit (Order No. 2001-01) because the Regional Board did not specifically address the issues raised in WQ Order No. 2000-11.

As discussed further below, the LARWQCB and the Regional Board have adequately addressed these issues. RGOs have been included as a SUSMP category in the Los Angeles County MS4 permit (Order No. R4-01-182), the statewide general Phase II MS4 permit (WQ Order No. 2003-0005-DWQ), and the Regional Board Southern Riverside County MS4 permit (Order No. R9-2004-001). The SWRCB also addressed the inclusion of RGOs through the appeals of MS4 permits issued by the Los Angeles and San Francisco Bay Area Regional Boards. The SWRCB held a workshop addressing RGOs and identified RGOs as significant sources of pollutants. The SWRCB then dismissed the petitions for removal of RGOs from the SUSMP requirements in the Los Angeles and San Francisco Bay Area MS4 permits.

The following issues regarding RGOs have been addressed:

Heavily Regulated - The heavily regulated distinction does not remove RGOs as significant source of pollutants in urban runoff and therefore should not be a basis for exempting them from SUSMP requirements. Other regulation of RGOs is separate from regulation under the CWA and does not necessarily relate to water quality and urban runoff. Moreover, other municipalities already require that RGOs implement structural BMPs, even though RGOs are regulated under other programs.

Treatment Limitations - Inexpensive and effective structural treatment BMPs which reduce pollutants and control peak flow rates and velocities are available for use at RGOs. Studies have shown that some catch basin inserts can remove hydrocarbons and heavy metals, which are typical pollutants of concern at RGOs. Sand or media filters have also been found to be effective and available for use at RGOs. Cisterns are examples of established BMPs to control flow, but RGOs could also use site design measures such as small weirs, baffles, and redirecting roof runoff to pervious areas.

Safety - No evidence has been provided to indicate that use of these structural BMPs at RGOs will pose a safety risk. In fact, filter BMPs have been installed at RGOs in other municipalities without apparent adverse safety effects. In addition, similar BMPs such as oil/water separators have been used for years by RGOs without safety problems.

Threshold - Studies indicate that runoff from RGOs contains similar pollutants to runoff from commercial parking lots. In precedential WQ Order 2000-11, the SWRCB determined that parking lots with a size threshold of 5,000 square feet or more is an appropriate SUSMP category. Based in part on the similarity of pollutants, the 5,000 square feet size threshold was also included for RGOs in the Order. In addition, other municipalities currently use similar size thresholds for RGOs when requiring design standards to mitigate storm water runoff. To provide additional flexibility for the Copermittees, another threshold of 100 or more motor vehicles ADT has been added to the Order. This threshold is based on requirements used in Washington and Oregon for what are considered “high use” sites. This is an appropriate threshold since vehicular traffic is a good indicator of the amount of pollutants generated at a site.

[116] SWRCB, 2000. Order WQ 2000-11.

The Regional Board followed the SWRCB's direction regarding RGOs by including the above discussion in this Fact Sheet, as well as a specific finding that justifies the regulation of urban runoff from RGOs that meet certain criteria. Considering all of the supporting documentation discussed above, it is appropriate to include RGOs as a Priority Development Project category.

Additional detailed supporting information can be found in the 2001 technical report titled *Retail Gasoline Outlets: New Development Design Standards for Mitigation of Storm Water Impacts* by the LARWQCB and the Regional Board.

Section D.1.d.(4) (Site Design BMP Requirements) requires the Copermittees to place site design requirements on new development within their jurisdictions. The site design BMP options listed in these sections are consistent with the site design BMPs currently required by the Copermittees in the Model SUSMP. However, the Model SUSMP employs an open-ended approach to requirements for site design BMPs, requiring implementation of site design BMPs "where determined applicable and feasible by the Copermittee." Unfortunately, this approach has proven to be ineffective in integrating site design BMPs in project designs. Audits of ten of the Copermittees' SUSMP programs exhibited that "many of the SUSMP plans reviewed for this program evaluation did not adequately address site design."[117] Moreover, the auditor identified site design as one of three principal areas where further program oversight was necessary.[118]

For these reasons, the Order directs the Copermittees to require new development projects to employ at least one site design BMP from each of the two lists of site design BMP options provided in this section of the Order. Two lists of site design BMP options are provided to represent different categories of site design BMPs available for implementation. The first list includes site design BMPs that are less frequently utilized, though they are effective and achievable. The second list includes site design BMPs which are commonly cited in project proponents' SUSMP reports as the site design BMPs that have been incorporated into Priority Development Projects. Implementation of one site design BMP from each list is required to improve site design implementation at Priority Development Projects, while providing a reasonable and achievable minimum measure for site design BMP implementation. Through its process of conditioning development projects under the CWA section 401 Water Quality Certification program, the Regional Board finds that this level of site design BMP implementation is feasible for all projects. This site design BMP requirement will help ensure that site design BMPs are implemented for new development projects. Site design BMPs are a critical component of urban runoff management at new development projects, since the BMPs provide multiple benefits including preservation of hydrologic conditions, reduction of pollutant discharges, cost effectiveness, and green space.

The Order continues to provide the Copermittees with flexibility in implementing site design BMP requirements by providing lists from which site design BMP approaches can be chosen. Moreover, flexibility is inherently included in the site design options listed - each option provides the opportunity for numerous implementation approaches that can be used to achieve compliance.

In its October 29, 2004 letter to the Copermittees, as well as in subsequent meetings, the Regional Board notified Copermittees of the need for improvement in site design BMP implementation at development projects. In addition, at its May 5, 2005 meeting with the Copermittees, the

[117] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 4.
[118] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 3.

Regional Board suggested that the Copermittees propose specific methods in their ROWD that would improve site design BMP implementation. In response, the Copermittees recommended that the Order "include an option for Copermittees to develop a low-impact design credit program." However, such a requirement would be unenforceable, due to its vague nature. Moreover, if such a credit program were to take years to develop, lack of implementation of site design BMPs would continue unabated. To address this issue, the Order includes minimum requirements for site design BMP implementation, while also providing the Copermittees with their requested option to develop a site design credit program.[119] This provides assurance that site design BMPs will be implemented in a timely manner, while also providing the Copermittees with flexibility for site design credit program development.

The site design BMP options listed do not need to be costly. Some design options, such as concave vegetated surfaces or routing rooftop or walkway runoff to landscaped areas, are cost neutral.[120] Other site design BMPs, such as minimizing parking stall widths or use of efficient irrigation devices, are oftentimes already required. In addition, use of these site design BMPs reduces runoff quantity, allowing for treatment control BMPs on site to be smaller, therefore savings costs. Routing runoff through landscaped areas can also reduce the cost of irrigation.

Section D.1.d.(5) (Source Control BMP Requirements) requires that Priority Development Projects implement minimum source control BMPs. This section has been added to provide more detail and clarify the Order's requirements for source control BMPs. The minimum source control BMPs listed in the section are consistent with the Model SUSMP.

Section D.1.d.(6) (Treatment Control BMP Requirements) clarifies that treatment control BMPs are not required to be designed to treat runoff from preservation areas, or other areas not being disturbed at a priority development project. This is a clarification of the requirements of Order No. 2001-01.

Section D.1.d.(6)(c)(i) ensures that priority development project proponents utilize the most accurate information to determine the volume or flow of runoff which must be treated. Using detailed local rainfall data, the County of San Diego has developed the 85th Percentile Precipitation Isopluvial Map, which exhibits the size of the 85th percentile storm event throughout San Diego County. Since this map uses detailed local rainfall data, it is more accurate for calculating the 85th percentile storm event than other methods which were included in Order No. 2001-01. The other methods found in Order No. 2001-01 were included as options to be used in the event that detailed accurate rainfall data did not exist for various locations within San Diego County. The County of San Diego's development of the 85th Percentile Precipitation Isopluvial Map makes these other less accurate methods superfluous. Therefore, these other methods for calculating the 85th percentile storm event have been removed from the current Order.

Section D.1.d.(6)(d)(i) (Treatment Control BMPs) requires that treatment control BMPs selected for implementation at Priority Development Projects have a removal efficiency rating that is higher than the "low removal efficiency," as presented in the Model SUSMP. The requirement allows exceptions for those projects that, with a feasibility analysis, can justify the use of a treatment control BMP with a low removal efficiency for a Priority Development Project. This requirement is needed because to date, the 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

[119] See section discussion for section D.1.d.(7) on the site design BMP credit program.
[120] BASMAA, 1999. Start at the Source. P. 149.

during audits of the Copermittees' SUSMP programs that many SUSMP reports do not adequately describe the selection of treatment control BMPs. Moreover, USEPA's contractor Tetra Tech, Inc. recommends that "project proponents should begin with the treatment control that is most effective at removing the pollutants of concern […] and provide justification if that treatment control BMP is not selected."[121]

In the ROWD, the Copermittees acknowledge the need for further attention to the selection and implementation of effective treatment BMPs. They propose to work with the Regional Board to come to a "common understanding" without a fixed permit requirement. However, due to this widespread deficiency regarding treatment control BMP selection in the Copermittees' SUSMP programs, the treatment control BMP feasibility requirement is needed in the Order. The requirement is needed to provide clarification that selection of low efficiency treatment control BMPs over high efficiency BMPs without justification does not meet permit requirements and is not in compliance with the MEP standard.

Section D.1.d.(7) (Site Design BMP Substitution Program) has provisions for the site design BMP credit program which largely mirror components of the program suggested by the Copermittees in their ROWD. In their ROWD, the Copermittees requested the option to develop a site design BMP credit program, under which projects that implement a high level of site design BMPs could receive credit towards compliance with treatment control BMP requirements. The program would provide the opportunity for development projects to avoid partial or full treatment control BMP implementation in exchange for implementation of a high level of site design BMPs. The Regional Board agrees that such a program could be beneficial. As the ROWD notes, the program could achieve equal or greater water quality benefits while also (1) providing greater assurance of adequate operation and maintenance; (2) improved review processes of site design BMP proposals; (3) increased acceptance of site design BMPs; and (4) greater usage of site design BMPs. For this reason, the Regional Board has added to the Order an option for the Copermittees to develop such a program.

In addition to the Copermittees' proposals, the provisions require (1) that runoff originating from pollutant generating exposed impervious areas must be routed through pervious areas prior to entering the MS4, and (2) that development project categories, such as automotive repair shops or streets, roads, highways, or freeways, which have a high potential to generate high levels of pollutants, not be covered under the program. Runoff from pollutant generating impervious areas must be routed through pervious areas in order to ensure that some level of treatment is provided for the protection of water quality. Without such a provision, the program could result in the direct discharge of significant levels of pollutants to the MS4 without treatment. In addition, development projects which frequently generate high levels of pollutants, such as automotive repair shops and streets, roads, highways, and freeways, should not be included in the program due to the need for treatment control BMPs at such development projects. When high levels of pollutants are present at a development project, site design BMPs alone are unlikely to adequately reduce pollutant discharges; treatment BMPs are also needed to polish urban runoff and serve as a last line of defense.

In precedent setting Order No. 2000-11, the State Board determined that implementation of treatment control BMPs is appropriate for development projects falling under the priority development project categories. Therefore, any program which allows development projects to forgo treatment control BMP implementation must include provisions which will achieve similar

[121] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 5.

water quality benefits. To ensure that this is the case for the site design BMP credit program, minimum provisions for the program have been added to the Order. Due to the addition of the minimum provisions in the Order, the program will not need to undergo a lengthy Regional Board approval process at a later date.

Section D. 1.d.(8) (Treatment Control BMP Design Standards) addresses a need for the Copermittees to develop and apply consistent criteria for the design and maintenance of structural treatment BMPs. Correct BMP design is critical to ensure that BMPs are effective and perform as intended. Without design criteria, there is no assurance that this will occur, since there is no standard for design or review. This issue was noted during audits of the Copermittees' SUSMP programs, where it was found that "some SUSMP reports did not clearly describe how treatment control BMPs were designed."[122] Based upon these findings, it was recommended that the Copermittees "require developers to use standard forms to document the design of treatment control BMPs. As an example, Ventura County has developed a BMP manual that includes standard design procedure forms for BMPs. Ventura County's *Technical Guidance Manual for Storm Water Quality Control Measures* is available at http://www.vcstormwater.org/publications.htm."[123] California Stormwater Quality Association (CASQA) also confirms the necessity of design criteria when it includes such criteria in its New Development and Redevelopment BMP Handbook.[124]

Section D.1.d.(11) (Waiver Provision) allows Copermittees to waive treatment BMPs when all available BMPs have been considered and rejected as infeasible. The requirement also allows the Copermittees to develop a program to require projects that receive waivers, to transfer the cost savings to a fund. The intent of the requirements is to allow Copermittees the necessary flexibility to waive treatment BMPs when it can be established that the implementation of treatment BMPs that meet numeric sizing criteria is not feasible at a given site. This provision also allows Copermittees discretion to transfer the cost savings from such a waiver to a fund for water quality projects within the watershed.

Section D.1.e (Treatment Control BMP Maintenance Tracking) requires steps to be taken by the Copermittees to ensure that approved treatment control BMPs are correctly constructed and maintained, including development of a database. This is critical to ensure that the treatment control BMPs are effective in removing pollutants from urban runoff leaving new development and significant redevelopment projects. Treatment control BMP maintenance has been identified as a critical aspect of addressing urban runoff from new development and significant redevelopment by many prominent urban runoff authorities, including the CASQA which states that "long-term performance of BMPs hinges on ongoing and proper maintenance."[125] USEPA also stresses the importance of BMP maintenance, stating: "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices."[126]

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[122] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 5.
[123] Ibid.
[124] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment.
[125] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment. P. 6-1.
[126] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

This permit section is needed due to findings that treatment control BMPs and treatment control BMP maintenance have predominantly not been tracked by the Copermittees. Following audits of SUSMP implementation of ten Copermittees, each of the Copermittees were recommended to develop a tracking system for treatment control BMPs and treatment control BMP maintenance. It has been found that "source and treatment control BMPs should be tracked in order to assess the number of BMPs installed, for reporting purposes, and to create an inventory for verifying maintenance in the future."[127] Moreover, during the SUSMP audits, two of the ten Copermittees audited were found to have inadequately maintained treatment BMPs within their jurisdiction.[128] Again, it was recommended that Copermittees "should periodically inspect selected SUSMP projects to verify if BMPs are being properly maintained."[129] USEPA also recommends "post-construction inspection and maintenance of BMPs" in the Phase II storm water regulations.[130]

At its May 5, 2005 meeting with the Copermittees, the Regional Board requested that the Copermittees propose a program for addressing treatment control BMP tracking and inspection in their ROWD. In response, the Copermittees' ROWD did not propose a program but instead recommended that the Order include "an option for the Copermittees to develop a Model Program for Permanent BMP Operation and Maintenance Verification."[131] This proposal lacks sufficient detail to be included in the Order, since it would result in an unenforceable permit requirement. As a result, the Order has been crafted to allow the Copermittees to develop their proposed program, but with minimum measurable outcomes to ensure that the program is adequate and effective.

These minimum measurable outcomes largely incorporate suggestions from the Copermittees' ROWD, though some contain more detailed requirements than what was proposed by the Copermittees. In particular, while the Copermittees are free to prioritize most projects with treatment control BMPs, those projects with drainage insert treatment control BMPs must be categorized as at least a medium priority. This will ensure that such projects will be inspected every other year. Tracking of these projects in this manner is necessary because of the frequent maintenance that drainage inserts require, as well as the sensitivity of drainage insert performance to adequate maintenance. Drainage inserts fill relatively rapidly, causing plugging and bypass, rendering them ineffective. For example, CASQA recommends "frequent maintenance, on the order of several times per year."[132]

Another significant measurable outcome requirement is that all projects with treatment control BMPs must be inspected for operation and maintenance at least once during the permit cycle. This is reasonable, since treatment control BMPs are typically recommended to be maintained semi-annually or annually. An activity which needs to be conducted semi-annually or annually should be spot-checked at least once every five years. Twenty percent of the projects within a jurisdiction with approved treatment BMPs are required to be inspected annually in order to ensure that treatment control BMP operation and maintenance oversight is consistent during the permit cycle.

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[127] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 6.
[128] Ibid. P. 25, 38.
[129] Ibid.
[130] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68845.
[131] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-16.
[132] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment. P. M-52.

Section D.1.f (BMP Verification) helps ensure that BMPs constructed at new development sites are consistent with proposed and approved design plans. Correct construction of BMPs is necessary to ensure that the BMPs are effective and that pollutants discharged from new development projects are reduced to the maximum extent practicable and do not cause or contribute to violations of water quality standards. This permit section is needed because it has been found that BMPs frequently are not constructed in the field as they were proposed by applicants and/or approved by Copermittees. Four of the ten Copermittees audited during the SUSMP audits were found to have projects within their jurisdictions with incorrectly constructed BMPs. It was recommended that Copermittees ensure "that the SUSMP BMPs are properly installed in the field. This includes verifying factors such as the location, sizing, and type of BMPs installed."[133] Also recommended is that "Copermittees should ensure that the BMP design details in SUSMP reports are translated to the engineering plan sheets used in the field."[134] In addition, USEPA recommends such practices in the Phase II storm water regulations, promoting "inspections during construction to verify BMPs are built as designed."[135]

Section D.1.g (Hydromodification) addresses the changes in a watershed's runoff characteristics resulting from development, together with associated morphological changes to channels receiving the runoff. These changes are termed hydromodification. As the total area of impervious surfaces increases in previously undeveloped areas, infiltration of rainfall decreases, causing more water to run off the surface at a higher rate. Runoff from developed areas can produce erosive flows in channels under rainfall conditions where previously they did not exist. Moreover, runoff from developed areas increases the duration of time that channels are exposed to erosive flows. The increase in the volume of runoff and the length of time that erosive flows occur ultimately intensify sediment transport, causing changes in sediment transport characteristics and the hydraulic geometry (width, depth, slope) of channels.[136]

These types of changes have been documented in southern California. It has been reported that researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22% can result in increases in peak flow rates for the two-year storm event of up to 100%.[137] Such changes in runoff have significant impacts on channel morphology. It has recently been found that ephemeral/intermittent channels in southern California appear to be more sensitive to changes in imperviousness than channels in other areas. Morphology of small channels in southern California was found to change with only 2-3% watershed imperviousness, as opposed to 7-10% watershed imperviousness in other parts of the nation.[138]

Stream channels typically respond to increased runoff rates and durations by increasing their cross-sectional area to accommodate the higher flows. This is done through widening of the channel banks, down-cutting of the channel bed, or both. This channel instability results in streambank erosion and habitat degradation, which is a significant impact to beneficial uses. Channel instability causes impacts to beneficial uses through sedimentation, loss of overhead

[133] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 6.
[134] Ibid.
[135] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68845.
[136] Santa Clara Valley Urban Runoff Pollution Prevention Program, 2005. Hydromodification Management Plan. P. 1-1.
[137] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[138] Coleman, et. al., 2005. Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams. P. iv.

cover, and loss of instream habitat structures, such as the loss of pool and riffle sequences.[139] Numerous studies have exhibited the link between urbanization, poor habitat quality, and impaired beneficial uses such as reduced insect and fish diversity.[140] These findings are also supported by the Copermittees' bioassessment data, which typically exhibits Poor to Very Poor Index of Biotic Integrity ratings for San Diego County channels, even though toxicity is frequently not found to be persistent.[141]

This section of the Order expands the requirements for control of hydromodification caused by changes in runoff resulting from development and urbanization. Expansion of these requirements is needed due to the current lack of a clear standard for controlling hydromodification resulting from development. While the Model SUSMP developed by the Copermittees requires project proponents to control hydromodification, it provides no standard or performance criteria for how this is to be achieved. Without any kind of clear standard or criteria, what must be done to prevent hydromodification is not known by project proponents and plan reviewers. As a result, project proponents do not know what to propose (if anything) and Copermittee review staff do not know what to require. Ultimately, Priority Development Projects implement few measures which can be expected to adequately control hydromodification. In any event, it is clear that Priority Development Projects in San Diego County are not implementing the type of measures which have been identified and required in other parts of California as necessary to prevent hydromodification.

To address this situation, this section of the Order requires the development and implementation of a Hydromodification Management Plan and outlines a process for the development and implementation of a standard and criteria to limit hydromodification of downstream channels. The required process is based on processes currently being developed and/or used in the San Francisco Bay Area and Los Angeles and Ventura Counties.[142] It also corresponds with the planned second phase of the Southern California Stormwater Monitoring Coalition's Hydromodification Control Study, which is expected to develop a regional stream classification system, a numerical model to predict the hydrological changes resulting from development, and to identify effective mitigation strategies.

A detailed example of a process that can be used to develop a standard and criteria for control of hydromodification resulting from new development can be found in the Santa Clara Valley Urban Runoff Pollution Prevention Hydromodification Management Plan.[143] It involves developing ratios of work done on representative channel segments by runoff, where work done to a channel segment under pre-urban conditions is compared to work done under existing conditions. The calculated ratio is called the Erosion Potential (Ep) of the channel segment.[144] The Ep ratios for particular channel segments are then compared to field classified erosion conditions (such as stable/low or medium/high level of erosion). This comparison is used to identify an Ep ratio that has a low risk of resulting in an unstable channel or a channel with a medium/high level of

[139] Schueler and Holland, 2000. The Importance of Imperviousness (Article 1). The Practice of Watershed Protection.
[140] Ibid.
[141] County of San Diego, 2005. San Diego County Municipal Copermittees 2003-2004 Urban Runoff Monitoring Final Report. By MEC Analytical Systems – Weston Solutions, Inc. Index of Biotic Integrity ratings give an absolute value to the benthic community quality based on the range of reference conditions in the region. The Index of Biotic Integrity ratings can be used to evaluate community conditions over time to monitor the effects of habitat degradation or the success of restoration efforts.
[142] See http://www.ccleanwater.org/construction/nd.php or http://www.scvurppp.org/ under "C.3 Submittals" for examples of a Hydromodification Management Plans.
[143] Santa Clara Valley Urban Runoff Pollution Prevention Program, 2005. Hydromodification Management Plan. P. 3-1 – 3-20.
[144] Ep is discussed in detail in the definitions section of the Permit.

erosion. Generally, an Ep of approximately 1, where work done hydraulically on a channel matches a baseline condition, will have a low risk of causing stream instability.

Once an Ep ratio that will result in stable channels is determined, it is used as a standard upon which to base development of runoff flow rate and duration criteria. Stream channel erosion is caused by increases in runoff flow rates and durations for the small and moderate magnitude runoff flows above the threshold for sediment transport and channel bank erosion.[145] Runoff flow rate and duration criteria identify the range of storms for which flow rates and durations must be controlled to pre-project conditions in order to meet the Ep standard. This involves identifying the critical flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks, and then relating the critical flow to a percentage of the 2-year peak flow, which serves as the lower bound of the range of storm events which must be controlled. The upper bound of the range of storm events is based on the storm event where significant post-project increases in the total work done on the channel do not occur.

Due to the ongoing high level of development in San Diego County, this section of the Order also contains an interim hydromodification standard for large Priority Development Projects. Without an interim hydromodification standard, major Priority Development Projects will be developed without hydromodification controls, resulting in impacts to relatively stable streams with good habitat quality. Examples of areas that can be expected to be developed in the near future include the Otay Valley Hydrologic Area and the Bonsall Hydrologic Subarea.

Priority Development Projects over 50 acres in size are required to meet the interim criteria because large projects have a greater potential to impact streams through hydromodification. Larger projects create more impervious surface, increasing runoff flow rates and durations to a greater extent, resulting in greater potential for hydromodification of receiving channels. The 50 acre size limit was chosen based on high priority status placed on construction sites larger than 50 acres. Applying an interim criteria to projects over 50 acres in size is manageable for Copermittees because of the relative infrequency of development projects larger than 50 acres. Approximately 88% of the construction sites with coverage under the statewide General Construction Storm Water Permit are smaller than 50 acres in size. Moreover, since larger Priority Development Projects typically have greater resources, they have the capability to conduct the necessary analyses and implement measures to maintain the morphology of receiving channels. For example, such analysis (together with proposed implementation of flow rate and duration controls) has been conducted for the Rancho Mission Viejo project in southern Orange County.[146]

The Copermittees' ROWD essentially proposes a continuation of the current process for addressing hydromodification. As with the existing process, it is proposed that the project proponent will somehow demonstrate that the Priority Development Project will not impact downstream erosion or stream habitat. However, as discussed above, without a standard or specific criteria for how this will be done, neither the project proponent or a Copermittee's project review staff will know what needs to be implemented. Without specific standards or criteria, effective measures cannot be expected to be implemented to control hydromodification. For this reason, this section contains requirements that specific standards and criteria to control hydromodification be developed.

[145] Santa Clara Valley Urban Runoff Pollution Prevention Program, 2005. Hydromodification Management Plan. P. 5-1.
[146] County of Orange, 2004. The Ranch Plan Draft Environmental Impact No. 589. Section 4.5.

Section D.1.h (Enforcement of Development Sites) ensures that the Copermittees will use enforcement to pursue corrections of noted violations at development sites. The section is being added to the Development Planning to complement the requirements for inspections of post-construction BMPs and BMP maintenance. Where ineffective BMP implementation or inadequate BMP maintenance is noted during inspections, Copermittees must take effective enforcement actions that ensure violations are corrected and pollutants are reduced to the maximum extent practicable. USEPA recommends the development of ordinances and the use of enforcement procedures to address post-construction storm water management issues in the Phase II storm water regulations.[147]

D. 2. Construction

The following legal authority applies to section D.2:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) provides that the proposed management program include "A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) provides that the proposed management program include "A description of procedures for site planning which incorporate consideration of potential water quality impacts."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include "A description of requirements for nonstructural and structural best management practices."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermitee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for the purposes of this subsection: […] (x) Construction activity including cleaning, grading and excavation activities […]."

[147] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68845.

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section D.2.a (Ordinance Update and Approval Process) requires each Copermittee to review and update its grading and storm water ordinances as necessary to comply with the MS4 permit. By updating the grading and storm water ordinances, the Copermittees will have the necessary legal authority to require construction sites to implement effective BMPs that will reduce pollutant discharges to the maximum extent practicable. The Order allows the Copermittees 365 days to review and update their ordinances. The 365 days should be more than adequate to allow for the relatively minor changes that might be needed since their ordinances were last updated under Order No. 2001-01.

This section now requires the Copermittees to review project proponents' storm water management plans for compliance with local regulations, policies, and procedures. USEPA recommends that it is often easier and more effective to incorporate storm water quality controls during the site plan review process or earlier.[148] In the Phase I storm water regulations, USEPA states that a primary control technique is good site planning.[149] USEPA goes on to say that the most efficient controls result when a comprehensive storm water management system is in place.[150] To determine if a construction site is in compliance with construction and grading ordinances and permits, USEPA states that the "MS4 operator should review the site plans submitted by the construction site operator before ground is broken."[151] Site plan review aids in compliance and enforcement efforts since it alerts the "MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities."[152] During audits of San Diego Copermittee storm water programs, it was found on two separate occasions that site plan and SWPPP review were inadequate and inconsistent.[153]

Section D.2.b (Source Identification) requires the Copermittees to develop and update a watershed based inventory of all construction sites regardless of size or ownership. This section has been modified to require at least monthly updates of construction site inventories to ensure the Copermittees have a more accurate inventory of construction sites within their jurisdiction. A regularly updated inventory of active construction sites will assist the Copermittees in ensuring that all sites are inspected per Order requirements. In the ROWD, the Copermittees provide support for more regular updates by stating "Any inventory…is likely to change significantly within weeks or even days."[154] Reporting of the inventory to the Regional Board would remain on an annual basis in the Jurisdictional Urban Runoff Management Program Annual Report.

Section D.2.c (BMP Implementation) includes modifications to the requirements for each Copermittee to designate and ensure implementation of a set of minimum BMPs at construction sites. These modifications are based on Regional Board findings and experience during implementation of Order No. 2001-01. During audits of the Copermittees' storm water programs,

[148] USEPA, 1992. Guidance 833-8-92-002. Section 6.3.2.1.
[149] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48034.
[150] Ibid.
[151] USEPA, 2000. Guidance 833-R-00-002. Section 4.6.2.4, P. 4-30.
[152] Ibid., P. 4-31.
[153] Tetra Tech, Inc., 2002. Program Evaluation Report – San Diego Area Storm Water Programs – El Cajon. P. 15; and Tetra Tech, 2005. Program Evaluation Report – San Diego Area Storm Water Programs – Port of San Diego. P. 15.
[154] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-23.

BMP implementation at construction sites was found to be second only to education in the number of deficiencies and potential permit violations. Eleven cities had deficiencies or potential permit violations, with the most common being that BMPs were not adequately implemented at construction sites and that the Copermittees' standards were not up to date. Both private and public construction sites were found to have inadequately implemented BMPs.[155] In addition, the only civil liability assessed on a municipality for violations of an MS4 permit under the previous municipal permit, Order No. 2001-01, was based in part on a Copermittee's failure to adequately implement or require implementation of BMPs at a construction site.[156]

This section describes the types of BMPs that are required to be implemented at construction sites. Many of these BMPs are found in Order No. 2001-01.[157] Differences in the BMP requirements from Order No. 2001-01 include: Removal of site priority specific BMP designations; removal of seasonal restrictions on grading; more specificity on slope stabilization; more specificity on phased grading; and the addition of advanced treatment requirements. Since pollution prevention methods are considered a BMP, the pollution prevention requirements have been moved to the BMP implementation section.

Unlike Order No. 2001-01, this Order does not require the Copermittee to designate a set of minimum BMPs for high, medium, and low threat to water quality construction sites. This change was made in recognition of most Copermittees' application of one consistent set of BMPs throughout their jurisdictions.

The Order's requirements for seasonal restrictions on grading have been changed. Seasonal restrictions on grading for storm water are difficult to implement due to the conflict between seasonal grading restrictions and endangered bird's breeding seasons; therefore the seasonal grading restrictions have not been included with the other BMPs in the Order. Found in southern California, the Least Bell's Vireo and the Coastal California Gnatcatcher are listed as federally endangered and threatened, respectively.[158] Permits issued by the California Department of Fish and Game (CDFG) restrict grading during these birds' breeding seasons, which is from April 10 to August 31 for the Least Bell's Vireo[159] and from February 15 to August 31 for the Coastal California Gnatcatcher.[160] Ideally storm water restrictions on grading would be during the wet season from October 1 through April 30.[161] Combined these restrictions would limit construction grading to be during the month of September, which is infeasible. Section D.2.c of the Order still requires "project proponents to minimize grading during the wet season and coincide grading with seasonal dry weather periods to the extent feasible. If grading does occur during the wet season, require project proponent to implement additional BMPs for any rain events which may occur."

Sections D.2.c.(1)(e-f) of the Order require slope stabilization on all active and inactive slopes during rain events regardless of the season, except in areas implementing advanced treatment. Slope stabilization is also required on inactive slopes throughout the rainy season. These

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[155] Tetra Tech, Inc., various. Program Evaluation Reports San Diego Area Storm Water Programs.
[156] Regional Board, 2005. Order No. R9-2005-0237. Administrative Assessment of Civil Liability against JRMC Realty, Inc. and the City of Escondido. P. 3.
[157] Regional Board, 2001. Order No. 2001-01, San Diego County MS4 Permit. P. 22.
[158] State of California, Department of Fish and Game, 2005. State and Federally Listed Endangered and Threatened Animals of California.
[159] United States Department of the Interior, Fish and Wildlife Service, 2001. Least Bell's Vireo Survey Guidelines.
[160] United States Department of the Interior, Fish and Wildlife Service, 1997. Coastal California Gnatcatcher (*Polioptila californica californica)* Presence/Absence Survey Guidelines.
[161] Regional Board, 2001. Order No. 2001-01, San Diego County MS4 Permit. Directive F.2.g.(2).

requirements are needed because un-stabilized slopes at construction sites are significant sources of erosion and sediment discharges during rainstorms. "Steep slopes are the most highly erodible surface of a construction site, and require special attention."[162] USEPA exhibits the importance of slope stabilization when it states that "slope length and steepness are key influences on both the volume and velocity of surface runoff. Long slopes deliver more runoff to the base of slopes and steep slopes increase runoff velocity; both conditions enhance the potential for erosion to occur."[163] In lieu of vegetation preservation or replanting, soil stabilization is the most effective measure in preventing erosion on slopes. Research has shown that effective soil stabilization can reduce sediment discharge concentrations up to six times, as compared to soils without stabilization.[164] In their ROWD,[165] the Copermittees propose that standardized requirements for slope stabilization be developed after Permit adoption, due to the unique differences between the Copermittees' programs and the "need to develop consensus." However, slope stabilization at construction sites is already the consensus among the regulatory community and is found throughout construction BMP manuals and permits. For these reasons, slope stabilization requirements have been added to the Order, while providing sufficient flexibility for each Copermittee's unique storm water program.

Sections D.2.c.(1)(g-j) of the Order provide more specificity regarding phased grading requirements, prescribing that phased grading be implemented utilizing a maximum disturbed area, as determined by the Copermittees. This specificity has been added to the Order because of the importance of phased grading in controlling sediment from leaving construction sites. Phased grading minimizes the disturbed area and the time that the soil is exposed to erosive conditions.[166] USEPA provides guidance stating "construction should be planned to occur in phases in order to minimize the amount of disturbed land exposed at any one time, thus limiting the overall erosion potential of the site."[167] It is important to note that phased grading does not limit the overall development of a project. Moreover, phased grading should not be confused with seasonal restrictions on grading that were addressed above.

The Copermittees are required to designate a maximum disturbed area to be open at any one time. The Order prescribes that construction projects within the Copermittees' jurisdiction are not allowed to expose more soil than the maximum disturbed area, unless authorized to do so in writing by the Copermittee. Prior to the Copermittee's authorization to exceed the maximum disturbed area, the construction site must be in compliance with applicable storm water regulations and have adequate control practices implemented to prevent storm water pollution. The Copermittee's authorization gives the construction industry the flexibility needed to conduct business while continuing to protect water quality. This permit requirement is not unprecedented. The Caltrans construction standard specifications states that no more than 17 acres be exposed unless otherwise approved by their engineer in writing.[168] If needed, local Caltrans districts can

[162] Schueler, T. and Holland, H., 2000. "Muddy Water In – Muddy Water Out?" The Practice of Watershed Protection. P. 6.
[163] USEPA, 1990. "Sediment and Erosion Control: An Inventory of Current Practices." P. II-1.
[164] Schueler, T. and Holland, H., 2000. "Muddy Water In – Muddy Water Out?" The Practice of Watershed Protection. P. 5.
[165] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-27.
[166] Schueler, T. and Holland, H., 2000. "Muddy Water In – Muddy Water Out?" The Practice of Watershed Protection. P. 5.
[167] USEPA, 1990. "Sediment and Erosion Control: An Inventory of Current Practices." P. III-1.
[168] State of California, Department of Transportation, 2002. "Standard Specifications for Construction of Local Streets and Roads." Section 7-1.01G; P. 52.

decrease the maximum disturbed soil area to 5 acres during the rainy season.[169] In the Order, the Copermittee determines the maximum disturbed acreage size.

In the ROWD,[170] the Copermittees report that because their programs are unique, more time is needed on phased grading to develop consensus and to further dialogue. They speculate that the phased grading requirements will need consultation with the construction community, California Department of Fish and Game, United States Fish and Wildlife Service, and the Army Corps of Engineers. The Copermittees propose that they develop phased grading requirements after adoption of the Order. However, phased grading was a requirement in Order No. 2001-01.[171] In the five years since the adoption of Order No. 2001-01, the Copermittees did not develop a consensus on phased grading requirements. Even though previously required, the Regional Board inspectors have never observed phased grading implemented within the jurisdictions of the Copermittees. The lack of Copermittee action on phased grading during the past Permit cycles has necessitated the adoption of more specific enforceable requirements on phased grading. Caltrans and its private contractors from the construction community have implemented phased grading on construction projects since 2000 with no issues raised by the construction community or resource agencies. The ability of the Copermittee to increase the size of the maximum disturbed area for a given site will enable the construction site to feasibly grade while maintaining compliance with other environmental permits.

Section D.2.c.(1)(k) of the Order requires the implementation of advanced treatment for sediment at construction sites that the Copermittees or the Regional Board determines to be a significant threat to water quality. In evaluating the threat to water quality, the following factors shall be considered: (1) soil erosion potential; (2) the site's slopes; (3) project size and type; (4) sensitivity of receiving water bodies; (5) proximity to receiving water bodies; (6) non-storm water discharges; and (7) any other relevant factors. Advanced treatment is defined in the Order as "using mechanical or chemical means to flocculate and remove suspended sediment from runoff from construction sites prior to discharge." Advanced treatment consists of a three part treatment train of coagulation, sedimentation, and polishing filtration.

Advanced treatment has been effectively implemented extensively in the other states and in the Central Valley Region of California.[172] In addition, the Regional Board's inspectors have observed advanced treatment being effectively implemented at large sites greater than 100 acres and at small, 5 acre, infill sites. Advanced treatment is often necessary for Copermittees to ensure that discharges from construction sites are not causing or contributing to a violation of water quality standards. For example, the Basin Plan lists the water quality objective for turbidity as 20 NTU for all hydrologic areas and subareas except for the Coronado HA (10.10) and the Tijuana Valley (11.10). For certain construction sites with large slopes and exposed areas, the only technology that is likely to meet 20 NTU is advanced treatment combined with erosion and sediment controls. To ensure the MEP standard and water quality standards are met, the requirement for implementation of advanced treatment at high threat construction sites has been added to the Order, while still providing sufficient flexibility for each Copermittee's unique program.

Sections D.2.c.(1)(l-m) of the Order require the revegetation of a construction site as early as feasible. The Order includes revegetation requirements in the BMP implementation section,

[169] Caltrans Storm Water Quality Handbooks, 2000. "Construction Site Best Management Practices Manual." Section 2.2.4.1.
[170] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-27.
[171] Regional Board, 2001. Order No. 2001-01, San Diego County MS4 Permit. Directive F.2.b.(4); P. 22.
[172] SWRCB, 2004. Conference on Advanced Treatment at Construction Sites.

while Order No. 2001-01 required revegetation as part of the grading ordinance update. Implementation of revegetation reduces the threat of polluted storm water discharges from construction sites. For example, it has been found that construction sites should permanently stabilize disturbed soils with vegetation at the conclusion of each phase of construction.[173] A survey of grading and clearing programs found one-third of the programs without a time limit for permanent revegetation, "thereby increasing the chances for soil erosion to occur."[174] USEPA states "the establishment and maintenance of vegetation are the most important factors to minimizing erosion during development."[175] With the construction site being responsible for revegetation, the Copermittee will be more likely to enforce revegetation requirements during oversight of construction site requirements.

Section D.2.c.(2) of the Order requires that dry season BMP implementation must include planning for and addressing rain events that may occur during the dry season. This requirements was added to the Order to emphasize that, although rare, thunderstorms do occur in inland areas of the San Diego Region during the dry season.

Section D.2.d (Inspection of Construction Sites) prescribes a minimum inspection frequency for construction sites. Where Order No. 2001-01 required weekly inspections of high priority sites and monthly inspections of medium and low priority sites during the wet season, this Order prescribes biweekly inspections during the wet season of high priority sites, monthly inspections for medium priority sites, and as needed inspections for low priority sites. High priority sites are identified as all sites greater than 50 acres, or greater than 1 acre and tributary to a CWA Section 303(d) water body impaired for sediment or discharging directly to a ESA. Medium priority sites are all sites causing soil disturbance of one acre or more that are not a high priority. The proposed changes to the Order allow the Copermittees to concentrate more effort on sites that are less than 50 acres, but still have significant disturbed areas. The reduction in inspection frequency for sites greater than 50 acres is justified because the sites have generally improved their erosion and sediment control measures since adoption of Order No. 2001-01. Biweekly inspections of these sites in the future should be sufficient to ensure compliance at these sites.

The Order omits Order No. 2001-01's provision allowing a Copermittee to decrease the inspection frequency for high priority sites if the Copermittee certifies in writing to the Regional Board that they have recorded the site's Waste Discharge Identification Number, reviewed the site's Storm Water Pollution Prevention Plan (SWPPP), assured the site's SWPPP is in compliance, and assured the SWPPP is properly implemented at the site. Under Order No. 2001-01, the Regional Board never received from any of the Copermittees a certification to decrease the inspection frequency at high priority sites. Since the certification process was never used, the language has been deleted from the Order.

In their ROWD,[176] the Copermittees recommend that the use of weather triggered action plans be used in place of minimum inspection frequencies at construction sites during the month of October. The Copermittees' proposal is not to be confused with using weather triggered action plans to implement BMPs; rather the plan would be used during October by Copermittees to conduct inspections. The Order does not include this measure because historical rainfall data shows that San Diego received significant rainfall during October in 2005, 2004, and 2000.[177]

[173] Schueler, T. and Holland, H., 2000. "Muddy Water In – Muddy Water Out?" The Practice of Watershed Protection. P. 5.
[174] Ibid.; P.11.
[175] USEPA, 1990. "Sediment and Erosion Control: An Inventory of Current Practices", P. II-1
[176] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-27.
[177] National Weather Service, Surface Observations at Lindbergh field; www.wrh.noaa.gov/sgx/obs/rtp/linber.html

Moreover, based upon Regional Board inspections, construction sites rarely have been found to have fully implemented their SWPPP by October 1 in anticipation of the rainy season. During those years that rainfall does not occur during October, Copermittees' biweekly inspections during October can ensure that construction sites are implementing and preparing for the eventual rains. Like dry weather inspections, these inspections can also identify sources of non-storm water pollution and discharges.

This section also requires the Copermittees to track the number of inspections for each inventoried construction site. This requirement has been added to ensure that the Copermittees can demonstrate that construction sites are inspected at the minimum frequencies.

Section D.2.e (Enforcement of Construction Sites) requires each Copermittee to develop and implement an escalating enforcement process that achieves prompt and effective corrective actions at all construction sites for violations of the Copermittee's requirements and ordinances. Each Copermittee develops their own unique enforcement procedure tailored for their specific jurisdiction. This requirement is similar to Order No. 2001-01, except that enforcement procedures are required to be escalating and enforcement sanctions are required to be implemented in a prompt and effective manner.

Under Order No. 2001-01, inspections conducted by the Regional Board noted deficiencies in the Copermittees' enforcement procedures and implementation. The most common issues found were that enforcement was not firm and appropriate to correct the violation, and that repeat violations did not result in escalated enforcement procedures. Moreover, in the municipal audit reports, deficiencies and potential permit violations were found in Copermittee's enforcement programs.[178] USEPA supports enforcement of ordinances and permits at construction sites stating "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations."[179] In addition, USEPA expects permits issued to municipalities to address "weak inspection and enforcement."[180] For these reasons, the enforcement requirements in this section have been modified, while providing sufficient flexibility for each Copermittee's unique storm water program.

In their ROWD, the Copermittees strongly oppose "the revision of Permit requirements for the purpose of standardizing processes that are necessarily unique to individual jurisdictions."[181] However, the Order does not require that Copermittees standardize enforcement procedures to be the same among all the Copermittees, but requires that each Copermittee will consistently implement their unique enforcement procedures at construction sites within their jurisdiction.

The Order requires that inspectors have the authority to conduct immediate enforcement actions when appropriate. Inspectors conducting immediate enforcement will quickly implement corrections to violations, thereby minimizing and preventing threats to water quality. When inspectors are unable to conduct immediate enforcement actions, the threat to water quality continues until an enforcement incentive is issued to correct the violation. In the municipal audits, storm water inspectors for several municipalities were found to lack the necessary

[178] Tetra Tech, Inc., 2002-05, Program Evaluation Reports – San Diego Area Storm Water Programs – July 23, 2002, Chula Vista P. 11, El Cajon P. 15; April 8, 2003, Oceanside P. 16; December 17, 2003, San Marcos P.20, Vista P.26; June 11, 2004, Poway P. 12, Santee, P. 15; January 31, 2005, Del Mar P.9, Solana Beach, P.12.
[179] USEPA, 1992. Guidance 833-8-92-002. Section 6.3.2.3.
[180] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48058
[181] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-28.

enforcement authority.[182] In its Phase II Compliance Assistance Guidance, USEPA says that "Inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties."[183] In order to issue warnings and assess penalties during inspections, inspectors need to have the legal authority to conduct enforcement.

D.3. Existing Development

D.3.a Municipal

The following legal authority applies to section D.3.a:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) provides that the proposed management program include "A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(3) provides that the proposed management program include "A description for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of deicing activities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) provides that the proposed management program include "A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(5) provides that the proposed management program include "A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a

[182] Tetra Tech, Inc., 2003-05. Program Evaluation Reports – San Diego Area Storm Water Programs –April 8, 2003, Oceanside P. 16; June 11, 2004, Poway P. 12, Santee, P. 15; January 31, 2005, Solana Beach, P.12.
[183] USEPA, 2000. 833-R-00-002, Storm Water Phase II Compliance Assistance Guide, P.4-31

level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section D.3.a.(2) (BMP Implementation) requires the Copermittees to designate minimum BMPs for all municipal areas and activities, regardless of their threat to water quality. The requirement that different types of BMPs be designated for different threat to water quality categories of municipal areas and activities has been removed from the Order to help simplify and clarify the Order's requirements. BMPs required to be implemented at a site can now be based on the sources or activities present at the site. This more closely matches the approach taken by the Copermittees in their JURMPs. Threat to water quality is used to determine inspection frequencies in section D.3.a.(7).

Section D.3.a.(3) (Operation and Maintenance of MS4 and Structural Controls) requires the Copermittees to inspect and remove waste from their MS4s prior to the rainy season. Additional wording has been added to clarify the intent of the requirements. The Copermittees will be required to inspect all storm drain inlets and catch basins. This change will assist the Copermittees in determining which basins/inlets need to be cleaned and at what priority. Removal of trash has been identified by the Copermittees as a priority issue in their long-term effectiveness assessment. To address this issue, wording has been added to require the Copermittees, at a minimum, inspect and remove trash from all their open channels at least once a year.

Section D.3.a.(5) (Sweeping of Municipal Areas) requires the Copermittees to implement a program to sweep all municipal roads, streets, highways, and parking facilities. This section has been added to ensure that the Copermittees are implementing this effective BMP at all appropriate areas. The reporting requirements of the Order have also be modified to ensure that the Copermittees consistently report their sweeping and pollutant removal activities.

Section D.3.a.(6) (Limit Infiltration From Sanitary Sewer to MS4/Provide Preventive Maintenance of Both) requires the Copermittees to implement controls and measures to limit infiltration of seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. In their ROWD, the Copermittees requested this section be removed form the Illicit Discharge Detection and Elimination Component and added to the Municipal Component since it is a municipal activity. We agree and have moved the section to the municipal component of the Order.

Section D.3.a.(7) (Inspection of Municipal Areas and Activities) establishes a minimum set of municipal areas and activities for oversight and inspection by the Copermittees. In their ROWD, the Copermittees stated that some high priority areas on the list are not present in San Diego County. In response to this comment, incinerators, uncontrolled sanitary landfills, sites for disposing and treating sewage sludge, and hazardous waste treatment, disposal, and recovery facilities have been removed as high priority municipal areas. Household hazardous waste collection facilities and parks/recreation facilities have been identified by the Copermittees as municipal areas in their JURMPs and therefore have been added to the high priority list.

D.3.b. Industrial and Commercial

The following legal authority applies to section D.3.b:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) provides that the proposed management program include "A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) provides that the Copermittee must "identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(2) provides that the proposed management program shall "Describe a monitoring program for storm water discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C) of this section, to be implemented during the term of the permit, including the submission of quantitative data on the following constituents: any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD, pH, BOD5 , TSS, total phosphorus, total Kjeldhal nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7)(iii) and (iv)."

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that the Copermittee "Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

Section D.3.b requires the Copermittees to implement an industrial and commercial program to reduce pollutants in runoff from all industrial and commercial sites/sources. The industrial and commercial sections of Order No. 2001-01 have been combined into one section in this Order. This change will streamline and simplify the Order, without negatively impacting water quality. This change is not unprecedented because industrial and commercial facilities are commonly

addressed together. For example, the Southern Riverside County MS4 Permit[184] combined industrial and commercial programs into one section. In addition, in their ROWD,[185] the Copermittees jointly addressed industrial and commercial components. USEPA contractor Tetra Tech also evaluated and reported on the industrial and commercial programs jointly during their program evaluations.[186]

Section D.3.b.(1)(a) (Commercial Sites/Sources) requires that building material retailers and storage, animal facilities, and power washing services be included in the Copermittee's inventory of commercial sites/sources. In their ROWD, the Copermittees state "Two sources that were not identified in the Permit [Order No. 2001-01] as high priorities (animal facilities and pressure washers) were determined to justify close attention due their significant number and their potential to discharge pollutants." The Regional Board agrees with the Copermittees statement in the ROWD; therefore, animal facilities and pressure washers are included in the source identification section. Building material retailers and storage facilities are included because they are potential sources of pollutants to urban runoff. These facilities typically store and vend building materials in the outdoors exposed to storm water without implementing BMPs.

The Order has revised requirements for identifying industrial sites/sources. The revised requirements are identical to those found in the Southern Riverside County MS4 permit.[187] USEPA requires the same identification: "Measures to reduce pollutants in storm water discharges to municipal separate storm sewers from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA)."[188] USEPA "also requires the municipal storm sewer permittee to describe a program to address industrial dischargers that are covered under the municipal storm sewer permit."[189] In order to more closely follow USEPA's guidance, this Order also includes operating and closed landfills, and hazardous waste treatment, disposal, storage and recovery facilities.

The Order continues to require the Copermittees to identify industrial sites and sources subject to the General Industrial Permit or other individual NPDES permit. This requirement is despite the Copermittees' recommendation, "The Permit should be amended to eliminate the requirement to include sites with coverage under the General Industrial Permit, or other permits with storm water requirements, on the list of minimum high priority industrial facilities."[190] USEPA supports the municipalities regulating industrial sites and sources that are already covered by a NPDES permit:

> "Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system. It is anticipated that general or individual permits covering industrial storm water discharges to these municipal

[184] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2; P. 24.
[185] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.1, P. D-37.
[186] Tetra Tech, Inc., 2002-05. Program Evaluation Reports – San Diego Area Storm Water Programs; July 23, 2002; December 13, 2002; December 26, 2002; April 8, 2003; December 17, 2003; June 11, 2004; January 31, 2005.
[187] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.b)(2); P. 25.
[188] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48056.
[189] Ibid.
[190] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.6, P. D-43

> separate storm sewer systems will require industries to comply with the terms of the permit issued to the municipality, as well as other terms specific to the permittee." [191]

And:

> "Although today's rule will require industrial discharges through municipal storm sewers to be covered by separate permit, USEPA still believes that municipal operators of large and medium municipal systems have an important role in source identification and the development of pollutant controls for industries that discharge storm water through municipal separate storm sewer systems is appropriate. Under the CWA, large and medium municipalities are responsible for reducing pollutants in discharges from municipal separate storm sewers to the maximum extent practicable. Because storm water from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for storm water discharges associated with industrial activity through their system in their storm water management program."[192]

The Order's requirement to inventory those sites subject to the General Industrial Permit is identical to the requirements found in the Southern Riverside County MS4 Permit, Order No. R9-2004-001.[193] USEPA supports the list of industrial facilities in the Order when it states the following:

> "The issue of industrial inspections also arose for the Los Angeles County MS4 permit. The State Board, in a memo dated November 9, 2001, from Michael Lauffer of the State board to Dennis Dickerson, Executive Officer of the Los Angeles Regional Board, noted that under Section 402 (p)(3)(B)(iii) of the CWA, the Board has broad authority to require 'such other provisions…as the State determines appropriate…' and that this would provide a basis for requirements that go beyond specific provisions of the EPA regulations. We would agree with the State Board on this matter, and that the Regional Board would have the authority to require inspections of all the industrial facilities listed in the permit [Order], notwithstanding the specific provisions of the EPA regulations."[194]

Section D.3.b.(2) (BMP Implementation) adds a pollution prevention requirement, since pollution prevention methods are considered a BMP. Moving this requirement will streamline the Order, without causing a detrimental effect on water quality.

Section D.3.b.(3) (Inspection of Industrial and Commercial Sites/Sources) includes requirements for inspections of industrial and commercial sites/sources. The Order is similar to the Southern Riverside County MS4 permit[195] in requiring that inspections check for coverage under the General Industrial Permit; assessment of compliance with Copermittee ordinances and permits related to urban runoff; assessment of BMP implementation, maintenance, and effectiveness; visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and education and outreach on storm water pollution prevention. The Order also requires that inspections include review of BMP implementation plans if the site uses or is required to use such a plan, and the review of facility monitoring data if the site monitors its runoff. These changes are necessitated by the results of

[191] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48006.
[192] Ibid. P. 48000
[193] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.b)(2); P. 25.
[194] Letter dated March 5, 2004 from Doug Eberhardt, EPA Manager to John Robertus, Executive Officer of Regional Board containing comments on Order No. R9-2004-001.
[195] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.d)(3); P. 26.

storm water program evaluations.[196] It was observed that 12 Copermittees had deficiencies or potential permit violations in their industrial and commercial component. The inspection section received twice as many comments than any other requirement in the industrial/commercial program evaluation reports section. These changes in the Order mimic USEPA's guidance: "Site inspections should include (1) an evaluation of the pollution prevention plan and any other pertinent documents, and (2) an onsite visual inspection of the facility to evaluate the potential for discharges of contaminated storm water from the site and to assess the effectiveness of the pollution prevention plan." [197] In 1999, USEPA "recognized visual inspection as a baseline BMP for over 10 years," and "visual inspections are an effective way to identify a variety of problems. Correcting these problems can improve the water quality of the receiving water." [198]

Section D.3.b.(3)(c) of the Order requires that at a minimum, 40% of the sites inventoried shall be inspected each year, including all sites determined to pose a high threat to water quality. This requirement maintains inspection frequencies and rates while allowing more flexibility for the Copermittees to decide where to conduct inspections. In the ROWD,[199] the Copermittees reported 18,017 industrial and commercial sources. In fiscal year 2002-2003, the Copermittees conducted 10,133 inspections, giving an inspection rate of 56%. In fiscal year 2003-2004, the Copermittees conducted 8,546 inspections giving an inspection rate of 47%. USEPA guidance[200] says, "management programs should address minimum frequency for routine inspections." The USEPA Fact Sheet – Visual Inspection[201] says, "To be effective, inspections must be carried out routinely. This requires a corporate commitment to implementing them."

In their ROWD,[202] the Copermittees recommend, "The Permit should allow revision of mandated inspection requirements in accordance with demonstrated needs." The Copermittees "strongly discourage Permit requirements that seek to establish minimum levels of inspection activity." The Order includes the minimum level of inspection activity because without minimum levels, the Regional Board has no assurance that inspections of commercial and industrial sites will be conducted. Without inspections, the Copermittees would be unable to adequately verify that industrial and commercial sites are in compliance with their local storm water ordinances and regulations. Even though minimum inspection levels have been included, the Order allows enough flexibility to maximize the effectiveness of inspections by concentrating resources on industrial and commercial sites that are higher threats to water quality without neglecting other industrial and commercial sites. Further flexibility is provided in prioritizing inspections, as discussed next.

The Order no longer includes a section titled "Threat to Water Quality Prioritization." Rather, threat to water quality prioritization is incorporated within the inspection section. The Order requires several criteria to determine if a site is a high threat to water quality that needs an annual inspection. This change is identical to the requirements in the Southern Riverside County MS4 permit,[203] except for the addition of a few criteria recommended in the Copermittees' ROWD.[204] The Copermittees recommended criteria that are included in the Order are No Exposure

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[196] Tetra Tech, Inc., 2002-05. Program Evaluation Reports – San Diego Area Storm Water Programs; July 23, 2002; December 13, 2002; December 26, 2002; April 8, 2003; December 17, 2003; June 11, 2004; January 31, 2005.
[197] USEPA, 1992. Guidance 833-8-92-002, section 6.3.3.4 "Inspection and Monitoring".
[198] USEPA, 1999. 832-F-99-046, "Storm Water Management Fact Sheet – Visual Inspection".
[199] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.
[200] USEPA, 1992. Guidance 833-8-92-002, section 6.3.3.4 "Inspection and Monitoring".
[201] USEPA, 1999. 832-F-99-046,, "Storm Water Management Fact Sheet – Visual Inspection".
[202] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.3.
[203] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.d)(1); P. 26.
[204] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.1.

Certification / Notice of Non-Applicability, Compliance History, and Facility Design. "Existing Regulatory Oversight" is already included as a criterion in the Order as "Whether the site is subject to the Statewide Industrial Permit." Self-certification status and Green Business Certification are not included in the Order because these certifications do not ensure that storm water is addressed. In the ROWD,[205] the Copermittees recommend, "The Permit should allow re-prioritization of currently mandated minimum high priority industrial and commercial sources." The Order has been modified to increase flexibility and allow the Copermittees to reprioritize sites as more information is learned about the sites' potential threat to water quality.

In their ROWD[206], the Copermittees recommend, "The Permit should allow and encourage alternatives to current inspection requirements." They suggest utilizing non-inspection methods including self-certification, certified submission of monitoring results demonstrating that benchmarks have been met, third-party inspections, facility- or industry-specific surveys, and/or phone interviews. The proposed alternatives do not provide the same level of compliance oversight as inspections provide; therefore the Order includes such a section not as an alternative to inspections but in addition to inspections. The Order allows the use of these alternatives if they are determined to be necessary by the Copermittee.

Section D.3.b.(4) (Regulation of Mobile Businesses) is a new section. Mobile businesses are service industries that travel to the customer to perform the service rather than the customer traveling to the business to receive the service. Examples of mobile businesses are power washing, mobile vehicle washers, carpet cleaners, port-a-potty servicing, pool and fountain cleaning, mobile pet groomers, and landscapers. These mobile services produce waste streams that could potentially impact water quality if appropriate BMPs are not implemented. Mobile businesses present a unique difficulty in storm water regulation. Due to the transient nature of the business, the regular, effective practice of unannounced inspections is difficult to implement. Also, tracking these mobile businesses is difficult because they are often not permitted or licensed and their services cross Copermittee jurisdictions. The Order takes into account the difficulties in regulating mobile businesses. Only those mobile businesses that are known to operate within their jurisdiction are required to be inventoried and notified. The inventory shall be updated as additional mobile businesses are identified.

The Order requires that mobile businesses shall be inspected as needed. Inspections can be accomplished in response to complaints. Inspections can be scheduled through contacting the business. Impromptu inspections can be conducted if a Copermittee's inspector observes a mobile business operating in the course of the inspector's normal travels throughout their jurisdiction. In their ROWD,[207] the Copermittees recommend, "Copermittees should increase their collaboration on the regulation of mobile businesses". The Order allows but does not require collaboration among the Copermittees. Due to the Copermittee's differences in watersheds, culture, ethnicity, ordinances, regulations, policies and procedures, Copermittee collaboration on regulating mobile businesses is left up to the Copermittees as they see fit.

Section D.3.b.(5) (Enforcement of Industrial and Commercial Sites/Sources) requires that inspectors have authority to conduct immediate enforcement actions when appropriate. Inspectors conducting immediate enforcement will quickly correct violations, thereby minimizing and preventing threats to water quality. When inspectors are unable to conduct immediate enforcement actions, the threat to water quality continues until an enforcement incentive is issued

[205] Ibid. Section D.5.2.
[206] Ibid. Section D.5.4
[207] Ibid. Section D.5.5.

to correct the violation. In the municipal audits, Tetra Tech reported deficiencies where several Copermittees needed to ensure that their storm water inspectors have enforcement authority.[208] In its Phase II Compliance Assistance Guidance, USEPA says that "Inspections give the MS4 operator an opportunity to additional guidance and education, issue warnings, or assess penalties."[209] In order to issue warnings and assess penalties during inspections, inspectors need to have the legal authority to conduct enforcement.

D.3.c. Residential

The following legal authority applies to section D.3.c:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section D.3.c.(2)(b) of the Order moves the residential pollution prevention requirements together with the other BMP requirements in order to improve the organization of the Order. This change has no net effect on the implementation and enforcement of the Order.

Section D.3.c.(2)(c) of the Order moves the requirement for proper management of used oil, toxic materials, and other household hazardous wastes to the residential section of the Order, since this requirement generally applies to residents. This change improves the organization of the Order, and has no net effect on its implementation and enforcement.

Section D.3.c.(4) (Regional Residential Education Program) of the Order requires each Copermittee to participate in a Regional Residential Education Program. An education program specifically targeting residential sources is needed due to the fact that residential housing units encompass the largest category of specific sources in San Diego County and have been identified by the Copermittees as a regional priority source. Moreover, the Copermittees recommend in their ROWD that such a program be developed. Section F.7 of the Order, which is referenced in section D.3.c.(4), expands on the Regional Residential Education Program requirements by requiring that the program focus on bacteria, nutrients, sediment, pesticides, and trash. This is appropriate for a regional education program, since the Copermittees have identified these constituents as regional priorities.

[208] Tetra Tech, Inc., 2002-05. Program Evaluation Reports – San Diego Area Storm Water Programs.
[209] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. 833-R-00-002. P. 4-31.

D.4. Illicit Discharge Detection and Elimination

The following legal authority applies to section D.4:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) provides that the proposed management program "shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittee include in its proposed management program "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) provides that the Copermittee include in its proposed management program "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) provides that the Copermittee include in its proposed management program "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) provides that the Copermittee include in its proposed management program "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(5) provides that the Copermittee include in its proposed management program "a description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the Copermittee include in its proposed management program "a description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(7) provides that the Copermittee include in its proposed management program "a description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary."

Section D.4.a (Illicit Discharges and Connections) requires the Copermittees to implement a program to actively seek and eliminate illicit connections and discharges (IC/ID). Additional wording has been added to this section to clarify and ensure that all appropriate (i.e., field personnel) municipal personnel are utilized in the program to observe and report these illicit discharges and connections.

Section D.4.b (Develop/Maintain MS4 Map) requires the Copermittees to develop or obtain a map of their entire MS4 system and drainages within their jurisdictions. To provide clarification to the Order, this requirement has been moved to the IC/ID component of the Order from the Dry Weather Field Screening and Analytical Monitoring Specifications (Attachment E in previous Order No. 2001-01).

Section D.4.d (Investigation/Inspection and Follow-Up) requires the Copermittees to conduct follow up investigations and inspect portions of the MS4 for illicit discharges and connections, based on dry weather field screening and analytical monitoring results. The section also requires the Copermittees to establish criteria for triggering follow up investigations. Additional language has been added to this section to clarify the minimum level of effort and timeframes for follow up investigations when dry weather action levels (developed by the Copermittees) are exceeded. Timely investigation and follow up when action levels are exceeded is necessary to identify sources of illicit discharges, especially since many of the discharges are transitory. The requirements for a 48-hour minimum response time when action levels are exceeded and for immediate response to obvious illicit discharges is necessary to ensure timely response by the Copermittees.

In its October 29, 2004 letter to the Copermittees, as well as in subsequent meetings, the Regional Board notified Copermittees that standardized procedures were necessary to ensure timely IC/ID investigations. In the ROWD, the Copermittees state that procedures for dry weather programs should not be standardized and that a minimum response timeframe would hamper their efforts to prioritize and respond to IC/IDs. However, the purpose of the dry weather action levels is to help the Copermittees prioritize and investigate the most likely IC/IDs. Sampling locations that exceed these action levels warrant timely investigation/response, and the minimum time frames in the requirements are reasonable. The Copermittees may also determine that the exceedances do not pose a threat to water quality and therefore do not warrant further investigation. The rationale for no further action for dry weather sampling stations that exceed action levels would be reported in the Jurisdictional Urban Runoff Management Program Annual Report.

D.5. Education Component

The following legal authority applies to section D.5:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include “A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the proposed management program include “A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Section D.5 includes an introductory paragraph that is the same as in Order No. 2001-01, except for the removal of Quasi-Governmental Agencies/ Districts. The Copermittees' ROWD recommends elimination of the requirement to educate quasi-governmental entities.[210]

Section D.5.a (General Requirements) includes education topics from the existing permit with some minor wording and formatting changes. The Copermittees' ROWD recommends that the Copermittees should focus educational efforts on the most important constituents and not on a list of topics.[211] The Regional Board agrees with the focused efforts, but a list of topics is needed to provide a goal of basic storm water knowledge. The Copermittees can choose how and to what degree to address these topics. Copermittees may decide to focus on some topics and not on others. Some topics may be more important for certain target communities or watersheds.

The Regional Board has incorporated the following recommendation from the Copermittees' ROWD into the permit: "Copermittee educational programs should emphasize underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges."[212] In conducting audits of the Copermittees' storm water program, Tetra Tech found that several of the Copermittees could improve education of specific target audiences with pollutant-specific educational campaigns, messages, or technical guidance.[213]

Section D.5.b (Specific Requirements) requires the Copermittees to educate their own departments and personnel. The new development and redevelopment as well as the municipal construction education requirements were taken from Order No. 2001-01 with some minor wording changes. Additional clarification was added regarding storm water management plans and SUSMP requirements due to deficiencies found during the SUSMP audits. The Regional Board considers it vital for the Copermittees' planning and development staff, who have a broad authority and influence over new and redevelopment projects, to thoroughly understand storm water management plan development and SUSMP requirements. Municipal construction staff also need a thorough understanding of SUSMP requirements to adequately oversee active construction projects which are implementing SUSMPs.

A new requirement has also been added for education of activity specific BMPs for municipal personnel and contractors performing activities that generate pollutants. Education is required at all levels of municipal staff and contractors. Education is especially important for the staff in the field performing activities which might result in discharges of pollutants if proper BMPs are not used. The CASQA Municipal Handbook states that successful implementation of BMPs is dependent on "Effective training of municipal and contract employees working in both fixed facilities and field programs."[214] This training can be conducted in either a formal or an informal tail-gate format.

Section D.5.b.(2) (New Development and Construction Education) requires the Copermittees to educate all project applicants, developers, contractors, property owners, community planning

[210] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-57.
[211] Ibid. P. D-52.
[212] Ibid. P. D-53.
[213] Tetra Tech, Inc., 2002-03. Program Evaluation Reports -- San Diego Area Stormwater Program.
[214] California Stormwater Quality Association, 2003. Stormwater Best Management Practices Handbook, Municipal. P. 5-1

groups, and other responsible parties about stormwater issues and BMPs, including annual training before the rainy season. The first requirement is taken from the existing permit sections on new development and construction, with some minor wording changes and an additional topic at the end to recognize the importance of training for field level construction workers. Different levels of training will be needed for planning groups, owners, developers, contractors, and construction workers, but everyone should get a general education of stormwater requirements. Education of all construction workers can prevent unintentional discharges, such as discharges by workers who are not aware that they are not allowed to wash things down the storm drains. Training for BMP installation workers is imperative because the BMPs will fail if not properly installed and maintained.[215] Training for field level workers can be formal or informal tail-gate format.

Section D.5.b.(3) (Residential, General Public, and School Children Education) requires the Copermittees to collaboratively develop and implement a plan to educate residential, general public, and school children through use of mass media, mailers, door hangers, booths at public events, classroom education, field trips, hands-on experiences, or other educational methods. USEPA supports education of the general community when it states: "An informed and knowledgeable community is critical to the success of a storm water management program since it helps ensure the following:

> Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important. […]
>
> Greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."[216]

Regarding target audiences, USEPA also finds that "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children."[217] The SWRCB TAC also supports education of schoolchildren, stating:

> "Target Audiences should include:
>
> 1. Government: Educate government agencies and officials to achieve better communication, consistency, collaboration, and coordination at the federal, state and local levels.
> 2. K-12/Youth Groups: Establish statewide education programs, including curricula, on watershed awareness and nonpoint source pollution problems and solutions, based on a state lead role building upon and coordinating with existing local programs.
> 3. Development Community: Educate the development community, including developers, contractors, architects, and local government planners, engineers, and inspectors, on nonpoint source pollution problems associated with development and redevelopment and construction activities and involve them in problem definitions and solutions.
> 4. Business and Industrial Groups."[218]

[215] Ibid P.2-6.
[216] USEPA, 2000. Storm Water Phase II Compliance Assistance guide. EPA 833-R-00-002.
[217] Ibid.
[218] SWRCB, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

D.6 Public Participation

The following legal authority applies to section D.6:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

No significant changes have been made to this section of the Order.

E. Watershed Urban Runoff Management Program

The following legal authority applies to section E:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(ii) states: "The Director may […] issue distinct permits for appropriate categories of discharges […] including, but not limited to […] all discharges within a system that discharge to the same watershed […]"

Federal NPDES regulations 40 CFR 122.26(a)(3)(v) states: "Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed, or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas [watersheds] which contribute storm water to the system."

Federal NPDES regulation 40 CFR 122.26(a)(5) states: "The Director may issue permits for municipal separate storm sewers that are designated under paragraph (a)91)(v) of this section on a system-wide basis, a jurisdiction-wide basis, watershed basis, or other appropriate basis."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) states: "Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls."

Section E.2.b of the Order requires the Copermittees to develop a watershed map. The section has been slightly modified from Order No. 2001-01 in that it no longer requires mapping of inventoried construction sites. The reason for this change is the temporary nature of construction sites. The location of construction sites is constantly changing, making the mapping of construction sites not useful.

Section E.2.c of the Order requires identification and description of available water quality data for each watershed. The minimum types of water quality data the Copermittees must consider are listed. For the most part, the listed types of water quality data match the types of data already used by the Copermittees for watershed management. Additional types of monitoring to be considered have been added, such as toxic hot spot and TMDL monitoring, because of their potential to provide useful information during identification and prioritization of watershed water quality problems. The listing of data types is necessary because the Copermittees have previously not used all available watershed water quality data while assessing watershed conditions. For example, in a March 10, 2003 letter, the Regional Board directed the Copermittees to utilize additional available data during WURMP implementation because initial Copermittee data use was limited.

Sections E.2.d and E.2.e of the Order require assessment and analysis of water quality data to prioritize each watershed's water quality problems, together with identification of the sources of the high priority water quality problems. These requirements are essentially the same as the requirements of Order No. 2001-01; they have simply been reorganized to more clearly convey the process required.

Section E.2.f of the Order requires the Copermittees to develop a list of Watershed Water Quality Activities for potential implementation. This requirement developed over time while working with the Copermittees on their WURMP implementation under Order No. 2001-01. In October 2004 letters, the Regional Board recommended the Copermittees develop a list of Watershed Water Quality Activities for potential implementation. Following receipt of the Regional Board letters, the Copermittees created Watershed Water Quality Activity lists. Although the Copermittees' lists needed improvement, the Regional Board found the lists to be useful planning tools that can be evaluated to identify effective and efficient Watershed Water Quality Activities. Because the lists are useful and have become a part of the WURMP implementation process, a requirement for their development has been written into the Order.

The goal of the WURMPs is to abate sources and reduce pollutant discharges causing the high priority water quality problems within a watershed. For this reason, it is required that the Watershed Water Quality Activity list describes how each Watershed Water Quality Activity will meet this goal.

Section E.2.g of the Order requires the Copermittees within a watershed to develop a strategy for implementation of Watershed Water Quality Activities and Watershed Education activities. The requirement for development of an implementation strategy is necessary because it should guide effective implementation of watershed activities. Moreover, it has been found that many of the Copermittees' current Watershed Water Quality Activities have no clear connection to the high priority water quality problems within the watersheds where they are being implemented. For example, when reviewing the 2003-2004 Watershed Urban Runoff Management Program Annual Report for the San Diego River, the Regional Board found that for several of the Watershed Water Quality Activities being implemented, it is "unclear what the connection is between this project and the identified high priority water quality problems in the watershed."[219] Similar findings were also noted during Regional Board review of the 2002-2003 Watershed Urban Runoff Management Program Annual Reports and issuance of corresponding comment letters.

Section E.2.h of the Order requires the Copermittees to evaluate the effectiveness of proposed activities. This will help the Copermittees choose the most effective activities for implementation. Implementation of effective activities is critical to ensure an effective Watershed Urban Runoff Management Program.

Section E.2.i of the Order requires each Copermittee to implement a certain number of Watershed Water Quality Activities annually. In crafting this section of the Order and the Watershed Water Quality Activity definition, the Regional Board sought to obtain a balance between the enforceability of the Order and Copermittee flexibility in implementing the Order.

So that the section is enforceable, it requires each Copermittee to implement a minimum number of Watershed Water Quality Activities which will directly and significantly abate sources and reduce pollutant discharges causing the high priority water quality problems within a watershed.

[219] Regional Board, 2005. Review of Notices of Violation Issued to the San Diego County Copermittees for Watershed Urban Runoff Management Program Implementation.

This requirement provides measurable outcomes for WURMP implementation. WURMP measurable outcomes are needed in the Order because the Regional Board previously found that Copermittee implementation of Watershed Water Quality Activities was inadequate over the course of several years, despite several Regional Board efforts to precipitate improvement. The Regional Board issued comment letters in March 2003, California Water Code section 13267 information request letters in October 2004, and Notices of Violation in June 2005, all in an attempt to improve the Copermittees' implementation of Watershed Water Quality Activities that would effectively reduce discharges of pollutants causing the watersheds' high priority water quality problems. In addition, in a detailed review of the Copermittees' 2003-2004 Watershed Urban Runoff Management Program Annual Reports, the Regional Board found that for most watersheds, the Copermittees' reported "water quality activities" would not result in any significant reduction of pollutant discharges.[220]

Despite these efforts and findings by the Regional Board, the majority of the Copermittees contended as a group that their WURMP implementation was adequate and that they were in compliance with Order No. 2001-01's WURMP requirements. The Copermittees' position exhibits the lack of clarity and unenforceability of Order No. 2001-01's language regarding implementation of Watershed Water Quality Activities. To rectify this situation and ensure that WURMP implementation actually results in pollutant discharge reductions, a requirement for measurable outcomes has been added to the Order in the form of a minimum number of Watershed Water Quality Activities to be implemented which must reduce the discharge of pollutants and abate pollutant sources.

While section J.1.h specifically requires implementation of a measurable number of Watershed Water Quality Activities, the section and the Watershed Water Quality Activity definition also provide significant flexibility to the Copermittees regarding what constitutes a Watershed Water Quality Activity. The bottom line requirements for Watershed Water Quality Activity is that they reduce pollutant discharges causing high priority water quality problems within a watershed and exceed the baseline jurisdictional requirements. Beyond these bottom line requirements, the Copermittees have ample implementation flexibility. For example, both jurisdictional and regional activities in some circumstances can be considered Watershed Water Quality Activities. The same is true for TMDL activities. In addition, Copermittees can implement Watershed Water Quality Activities within their jurisdictions or outside of their jurisdictions; whichever they prefer. Moreover, Copermittees within a watershed can implement different Watershed Water Quality Activities, provided they are part of the watershed Copermittees' larger watershed strategy.

Details regarding what constitutes a Watershed Water Quality Activity are included in the definition section of the Order. The definition was written to clarify the following points:

- A Watershed Water Quality Activity must abate the sources and/or reduce the discharge of pollutants causing high priority water quality problems in the watershed. Activities that do not specifically abate sources and/or reduce pollutant discharges causing high priority water quality problems in a watershed are not Watershed Water Quality Activities.

- Watershed Water Quality Activities must implement an overall watershed strategy collaboratively developed by the Copermittees within a watershed.

[220] Regional Board, 2005. Supplemental Report for Review of Notices of Violation Issued to the San Diego County Copermittees for Watershed Urban Runoff Management Program Implementation. P. 5-14.

- Jurisdictional activities which exceed the baseline jurisdictional requirements may constitute Watershed Water Quality Activities, if they are more protective of water quality than baseline jurisdictional activities. Such activities must specifically abate sources and/or reduce the discharge of pollutants causing high priority water quality problems within a watershed. The jurisdictional activities must be organized and implemented as part of a larger watershed strategy.

- Specific Watershed Water Quality Activities do not need to be implemented watershed-wide, but all Copermittees within a watershed must implement well-coordinated Watershed Water Quality Activities.

- Watershed Water Quality Activities must be new activities; activities that have been conducted for many years without regard for watershed concerns are not Watershed Water Quality Activities. Moreover, as high priority water quality problems within watersheds continue, efforts to implement new and more effective activities are needed.

- Education, public participation, and planning efforts are not Watershed Water Quality Activities.

- Activities that only consist of monitoring are not Watershed Water Quality Activities. There must also be an element of the monitoring program that directly results in the abatement of sources and/or reduction of pollutant discharges causing high priority water quality problems.

This section of the Order also splits the implementation of Watershed Water Quality Activities into two categories. The first category requires implementation on an annual basis. This helps ensure meaningful and consistent implementation and allows for the use of measurable outcomes. The second category recognizes that not all Watershed Water Quality Activities lend themselves to annual implementation. The Copermittees are provided significant flexibility in taking the steps necessary to implement long-term Watershed Water Quality Activities, since no time frame for implementation is dictated.

Sections E.2.j and E.2.k of the Order require development of a list of potential Watershed Education Activities and implementation of a portion of those activities. Specific implementation of Watershed Education Activities in each jurisdiction within a watershed is being required due to the Regional Board's findings that previous Copermittee reporting often has not exhibited implementation of watershed and pollutant specific education activities. Moreover, the Regional Board has found from the Copermittees' reporting that regional education efforts are not always implemented in all watersheds. These findings have been documented in the Regional Board's Watershed Urban Runoff Management Program Annual Report review letters, which were issued in March 2003 and October 2004.

Implementation of Watershed Education Activities has been split into two categories, in order to represent two types of education pertaining to watershed management of urban runoff. During the previous permit cycle, the Copermittees primarily focused on watershed concept-based education activities. These efforts should proceed, but as high priority water quality problems and impairments within watersheds continue, source and pollutant discharge-based education efforts are also needed. The two categories of Watershed Education Activities provided in the Order ensure that both types of watershed education are conducted.

Section E.2.l of the Order includes minor alterations from Order No. 2001-01 which encourage the Copermittees to seek participation in the WURMP process from other potential interested parties. Increased participation in the WURMP process by interested parties can improve support for WURMP implementation, increasing the probability of implementation of effective programs.

Section E.2.m of the Order requires Copermittee collaboration, including frequent regularly scheduled meetings. The requirement for regularly scheduled meetings has been added based on Regional Board findings that watershed groups which hold regularly scheduled meetings (such as for San Diego Bay) typically produced better programs and work products than watershed groups that went for extended periods of time without scheduled meetings (such as San Dieguito and Los Penasquitos). For example, in their 2002-2003 Annual Reports, the San Dieguito and Los Penasquitos watersheds listed implementation of the same watershed activities, despite the fact that the two watersheds have different high priority water quality problems.

F. Regional Urban Runoff Management Program

The following legal authority applies to section F:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Federal NPDES regulations 40 CFR 122.26(a)(3)(v) states: "Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed, or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas [watersheds] which contribute storm water to the system."

Federal NPDES regulation 40 CFR 122.26(a)(5) states: "The Director may issue permits for municipal separate storm sewers that are designated under paragraph (a)91)(v) of this section on a system-wide basis, a jurisdiction-wide basis, watershed basis, or other appropriate basis."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) states: "Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls."

Section F of the Order requires the Copermittees to develop a Regional Urban Runoff Management Program to facilitate Copermittee implementation of urban runoff management activities on a regional level. The requirement has been included in the Order because of the recognition that some aspects of urban runoff management can be effectively addressed at a regional level. Residential education and implementation of TMDLs covering multiple watersheds are examples of urban runoff issues which can be addressed regionally, since the scope of these issues are not limited to particular jurisdictions or watersheds. Such regional implementation provides opportunities for improved efficiency and utilization of economies of scale.

The Copermittees' ROWD identifies regional urban runoff management as an important aspect of their programs.[221] This requirement for the development of a regional urban runoff management program provides organization and structure for both the Copermittees and Regional Board to track regional efforts. The requirements include continuation of existing regional efforts and identify additional areas for regional implementation. However, significant flexibility has been provided to the Copermittees for new regional requirements. Typically, implementation of such regional requirements is required only where it is determined to be necessary by the Copermittees.

G. Fiscal Analysis

The following legal authority applies to section G:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(vi) provides that "[The Copermittee must submit] for each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2)(iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds."

Section G has been expanded to achieve better consistency between the Copermittees in reporting budget and expenditure information. The section also requires clarification regarding which expenditures are solely attributable to the urban runoff program, as opposed to those expenditures which are also partially attributable to other programs (such as trash collection and street sweeping). Consistency and clarification of fiscal information are valuable for assessing program effectiveness and adapting programs to help ensure that they are efficient and effective, which is one important purpose of the fiscal analysis.

This section also requires the Copermittees to develop and use a metric for fiscal analysis reporting. This provides standardization of reporting so that figures between Copermittees are comparable, which is one of many types of information which can be used by the Regional Board to better understand Copermittee program implementation. Standardization and comparison of fiscal analysis reporting is supported by the State Board funded NPDES Stormwater Cost Survey, which finds that "standards for reporting costs and stormwater activities are needed to allow accurate cost comparisons to be made between stormwater activities."[222] This document also provides guidance regarding categorization of expenditures for tracking and reporting.

H. Total Maximum Daily Loads

The following legal authority applies to section H:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

[221] San Diego County Copermittees, 2005. Report of Waste Discharge. P. C-12.
[222] Currier, et al., 2005. NPDES Storm Water Cost Survey Final Report. Prepared for California State Water Resources Control Board by Office of Water Programs, California State University, Sacramento. P. 63.

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section H of the Order incorporates the two TMDLs that have been fully approved and are effective for the Copermittees. These TMDLs are for diazinon in Chollas Creek and for dissolved copper in SIYB.

Where a TMDL has been approved, NPDES permits must contain effluent limitations and conditions consistent with the requirements and assumptions in the TMDL.[223] Effluent limitations are generally expressed in numerical form. However, USEPA recommends that for NPDES-regulated municipal and small construction storm water discharges, effluent limitations should be expressed as best management practices or other similar requirements rather than as numeric effluent limitations.[224] Consistent with USEPA's recommendation, this section implements WQBELs expressed as an iterative BMP approach capable of meeting the WLAs in accordance with the associated compliance schedule. The Order's WQBELs include the numeric WLA as a performance standard and not as an effluent limitation. The WLA can be used to assess if additional BMPs are needed to achieve the TMDL Numeric Target in the waterbody.

Section H.1.a requires the Copermittees to implement BMPs capable of achieving the WLAs for diazinon in the storm drains in accordance with the Compliance Schedule. This requirement is consistent with the USEPA memorandum dated November 22, 2002, which states that NPDES permit conditions must be consistent with the assumptions and requirements of available WLAs.[225]

Section H.1.b requires that the Copermittees not cause or contribute to violations of the Interim TMDL Numeric Targets for diazinon in Chollas Creek. This requirement is necessary to ensure the effectiveness of the BMPs. The BMPs for diazinon control consist primarily of a phase out of the legal uses of diazinon and education and public outreach. Due to the difficulty in measuring the effectiveness of these BMPs directly, an indirect assessment method is necessary in the form of a receiving water limit.

Section H.1.c requires the Copermittees to implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach / Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, August 14, 2002, to achieve the WLA. These BMPs are expected to be effective based on the current monitoring in Chollas Creek which shows dramatically decreasing levels of diazinon in the water column.[226]

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[223] 40 CFR 122.44(d)(1)(vii)(B)
[224] USEPA, 2002. Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs. P. 4.
[225] Ibid.
[226] Chollas Creek Copermittees, 2006. Response to Monitoring in Chollas Creek, Investigation Order No. R9-2004-0277, Proposition 13, PRISM Grant Agreement No. 04-17-559-0, San Diego Region, Integrated Pest Management

Compliance with Section H.1.a and c will be assessed with the WURMP annual reports, which will include a description of all TMDL activities implemented in the watershed and an effectiveness assessment of those activities. Compliance with Section H.1.b will be assessed using the monitoring data collected pursuant to the existing Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the discharge of Diazinon in the Chollas Creek Watershed, San Diego, California* (Investigation Order). This Investigation Order requires water column samples to be collected at two locations and analyzed for diazinon during three storms annually. Water column samples will also be analyzed for total and dissolved copper, lead, and zinc, and hardness. Acute and chronic toxicity tests will be conducted using the water flea for samples from each of these storm events at these two locations. Concentrations of diazinon in sediment at three locations will also be evaluated.

The diazinon water column values obtained from the Investigation Order R9-2004-0277 sampling will be compared with the Interim TMDL Numeric Target adjusted for the time schedule as shown below:

Calendar Year	Year	Waste Load Allocation	Interim TMDL Numeric Target	% Reduction
2004	1	0.460 µg/L	0.5 µg/L	0
2005	2	0.460 µg/L	0.5 µg/L	0
2006	3	0.460 µg/L	0.5 µg/L	0
2007	4	0.414 µg/L	0.45 µg/L	10
2008	5	0.322 µg/L	0.35 µg/L	20
2009	6	0.184 µg/L	0.20 µg/L	30
2010	7	0.045 µg/L	0.05 µg/L	30

Chollas Creek Diazinon TMDL - Background

Chollas Creek was placed on the CWA section 303(d) List of Water Quality Limited Segments (303(d) List) in 1996 for toxicity. The pesticide diazinon was found to be causing the toxicity. The Regional Board has established a TMDL for diazinon to address the toxicity as required by the CWA for water quality limited segments at the August 14, 2002 Regional Board meeting. The State Water Resources Control Board approved the TMDL on July 16, 2003. The Office of Administrative Law approved the TMDL on September 11, 2003. USEPA approved the TMDL on November 3, 2003. Documentation for the Chollas Creek Diazinon TMDL is in the report titled, "Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County, August 14, 2002."

The Chollas Creek diazinon TMDL is a concentration based TMDL determined from the CDFG's Water Quality Criteria (WQC) for the protection of freshwater aquatic organisms from diazinon. Using a margin of safety (MOS) of 10%, the TMDL is equal the WLA plus the MOS. The TMDL Numeric Targets and WLA derived from the CDFG WQC are shown in the table below.

(IPM) Education and Outreach Program, 2004-2005 Water and Sediment Quality Monitoring Data Summary for Chollas Creek. P. 48, Figure 4-2.

TMDL Numeric Targets and Waste Load Allocation for Diazinon Acute and Chronic Conditions

Exposure Duration	TMDL Numeric Targets	Margin of Safety	Waste Load and Load Allocations
Acute	0.08 µg/L	0.008 µg/L	0.072 µg/L
Chronic	0.05 µg/L	0.005 µg/L	0.045 µg/L

A compliance schedule for achieving the WLAs was established by the Regional Board Executive Officer on September 30, 2004. This compliance schedule uses an exponential approach to reduction that involves an increasing percent reduction over a 7-year period to meet the objectives. This percent reduction established for WLA in the September 2004 compliance schedule was used to calculate the Interim TMDL Numeric Targets shown in the table below:

Compliance Schedule for Diazinon TMDL Implementation

Calendar Year	Year	Waste Load Allocation	Interim TMDL Numeric Target	% Reduction
2004	1	0.460 µg/L	0.5 µg/L	0
2005	2	0.460 µg/L	0.5 µg/L	0
2006	3	0.460 µg/L	0.5 µg/L	0
2007	4	0.414 µg/L	0.45 µg/L	10
2008	5	0.322 µg/L	0.35 µg/L	20
2009	6	0.184 µg/L	0.20 µg/L	30
2010	7	0.045 µg/L	0.05 µg/L	30

The WLAs shall not be exceeded more than 1 time in any 3-year period. Season and flow conditions will not be a consideration.

Section H.2.a requires the Copermittees in the SIYB watershed to implement BMPs to maintain a total annual copper load of less than or equal to 30 kg copper/year.

Section H.2.b requires the Copermittees in the SIYB watershed to implement, at a minimum, the BMPs contained in the Copermittees' JURMP which address the discharge of copper to achieve the total annual copper load in Section H.2.a above. The WLA was established to maintain the current discharge level of 30 kg copper/year which leads to the conclusion that the current BMPs being implemented in the Copermittees' JURMP will be effective in maintaining this discharge level. Compliance with these requirements will be assessed by re-evaluating the data and assumptions used to estimate the WLA to SIYB of 30 kg copper/year. The Copermittees will be required to evaluate if any changes have occurred in the watershed which could cause or contribute to a higher copper urban runoff discharge and any actions necessary to address these changes. Because the original WLA for municipalities in SIYB was calculated using land use data, drainage area size, event mean concentration and modeling with no actual water quality samples, it is appropriate to use the same or similar method to assess compliance.

SIYB Copper TMDL - Background

SIYB is a popular recreational marina located at the north end of San Diego Bay. It is a semi-enclosed marina that supports a high density of recreational vessels in an area of low tidal flushing. The SIYB watershed is within the City of San Diego. SIYB was placed on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List) in 1996 due to high concentrations of dissolved copper. The Regional Board has established a TMDL for dissolved copper in SIYB as required by the CWA at the February 9, 2005 Regional Board meeting. The SWRCB approved resolution R9-2005-0019 on September 22, 2005. The Office of Administrative Law approved the TMDL on December 2, 2006 and Resolution R9-2005-0019

has been forwarded to USEPA for final review and approval. Documentation for the SIYB Copper TMDL is included in the report titled, "Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay, Technical Report, February 9, 2005."

The existing dissolved copper load from urban runoff to SIYB was estimated to be roughly 30 kg copper/year or 1% of total loading. Due to the relatively insignificant magnitude of the contribution of dissolved copper from urban runoff, no reductions were assigned to urban runoff and the WLA was assigned the existing 30 kg copper/year. The Basin Plan has been amended to include the following "The Regional Board will amend Order No. 2001-01, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems* to require that discharges of copper into Shelter Island Yacht Basin waters via the City of San Diego's MS4 not exceed a 30 kg/year wasteload for copper."[227]

The WLA for urban runoff was estimated using land use data, drainage area size, event mean concentration for copper in residential areas. This information and assumptions such as wet weather copper concentrations equal dry weather concentrations were used to estimate the WLA of 30 kg copper/year. Once during the permit cycle, the Copermittees will evaluate the data and assumptions used in estimating the WLA to ensure that nothing has changed which could result in a higher copper discharge.

I. Program Effectiveness Assessment

The following legal authority applies to section I:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(v) provides that the Copermittees must include "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water." Under Federal NPDES regulation 40 CFR 122.42(c) applicants must provide annual reports on the progress of their storm water management programs.

Section I.1.a of the Order requires the Copermittees to assess the effectiveness of the implementation of their jurisdictional programs and activities. The section requires both specific activities and broader programs to be assessed since the effectiveness of jurisdictional efforts may be evident only when considered at different scales. The effectiveness assessment requirements incorporate the approaches developed by the Copermittees in their October 16, 2003 "Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs," including use of "outcome levels" and "major effectiveness assessment elements."

In their ROWD, the Copermittees request that use of particular outcome levels not be required for assessing the effectiveness of specific activities implemented by the Copermittees. Because many of the techniques for using the various outcome levels are still in development, the conditions under which each outcome level must be used is not specified in the Order. However,

[227]Regional Board, 2005. Attachment A to Resolution No. R9-2005-0019, Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay. P. 5.

during review of the Copermittees' annual reports, the Regional Board has frequently needed to request that the Copermittees improve their effectiveness assessments and utilize the various assessment methods that are available. Moreover, half of the Copermittees audited were found to have inadequate effectiveness assessments which frequently lacked use of measurable goals. For these reasons, the Order contains language requiring the Copermittees to utilize the various outcome levels "where applicable and feasible." This will help ensure that the Copermittees vigorously use outcome levels, while also providing the Copermittees with flexibility to develop techniques to use outcome levels where such techniques do not currently exist.

The Copermittees also request in their ROWD that they not be responsible for assessment of the impact of their jurisdictional programs on pollutant load reductions, urban runoff water quality, and receiving water quality (outcome levels 4-6). This request slights the overall goal of the Copermittees' jurisdictional programs, which is to reduce discharged pollutants loads and improve water quality. A link between the Copermittees' jurisdictional programs and improved urban runoff and receiving water conditions must be made whenever adequate information exists. This can help validate current efforts, which is essential for maintaining program support, while also guiding future efforts.

Assessments of jurisdictional programs on water quality have been conducted by Copermittees in the past and have been useful. For example, the City of Encinitas reports decreasing bacteria levels in commercial areas following increased inspections of commercial facilities. The City also reports similar results in residential areas following increased residential education efforts.[228] Such information provides very useful feedback to the Copermittees, since the results are specific and localized. The results provide direct evidence of program impact which may otherwise be missed by assessments conducted at a watershed level. Program assessment capable of linking jurisdictional programs and water quality improvements is an important tool that can exhibit to program managers, decision makers, and the public that jurisdictional urban runoff management program efforts are worthwhile and should continue. For these reasons, the Order requires the Copermittees to assess the impact of their jurisdictional program on pollutant load reductions and water quality, where applicable and feasible.

Section I.1.b of the Order requires the Copermittees improve jurisdictional activities or BMPs when they are found to be ineffective or when water quality impairments are continuing. This requirement fulfills the purpose of conducting effectiveness assessments – to improve and refine the Copermittees' programs. The requirement is consistent with USEPA's Phase II regulations, which state: "If the permittee determines that its original combination of BMPs are not adequate to achieve the objectives of the municipal program, the MS4 should revise its program to implement BMPs that are adequate […]."[229]

Section I.2.a of the Order requires the Copermittees to assess the effectiveness of the implementation of their watershed programs and activities. The section requires both specific activities and broader programs to be assessed since the effectiveness of watershed efforts may be evident only when considered at different scales. The effectiveness assessment requirements incorporate the approaches developed by the Copermittees in their October 16, 2003 "Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs," including use of "outcome levels" and major effectiveness assessment elements.

[228] City of Encinitas, 2006. Jurisdictional Urban Runoff Management Program Annual Report FY 2004-2005. P. 11-9.
[229] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68762.

As with the jurisdictional assessments discussed for section I.1.a, the Order contains language requiring the Copermittees to utilize outcome levels 1-4 for assessment "where applicable and feasible." This will help ensure that the Copermittees vigorously use the outcome levels, while also providing the Copermittees with flexibility to develop techniques to use outcome levels where such techniques do not currently exist. The section also places particular focus on the Copermittees' utilization of outcome levels 5 and 6, which address urban runoff and receiving water quality. Since the entire thrust of the watershed urban runoff management programs is to improve the high priority water quality problems within the various watersheds, use of outcome levels 5 and 6 is needed to assess the effectiveness of the watershed urban runoff management programs. After 15 years of implementation of the storm water program in San Diego County, impact of the program on water quality must be assessed. Without such assessments, it will not be known whether the watershed urban runoff management programs are achieving their purpose. The Copermittees' receiving waters monitoring program, which is watershed-based, is expected to provide the Copermittees with information to conduct these assessments.

Section I.2.b of the Order includes requirements for modification of watershed activities similar to those for modification of jurisdictional activities discussed in section I.1.b. Please see the section I.1.b discussion for further information.

Section I.3.a of the Order requires the Copermittees to assess the effectiveness of their regional activities and programs in a manner similar to the assessment requirements discussed for section I.1.a and I.2.a. Please see the discussions for these sections for further information. Section I.3.a also requires the Copermittees to evaluate their progress in implementing measures on a regional basis. These evaluations are needed to track the Copermittees' progress towards meeting their goals and objectives for regional urban runoff management.

Section I.4 (TMDL BMP Implementation Plan) requires the Copermittees to assess the effectiveness of their TMDL BMP Implementation Plans or equivalent plans in a manner similar to the assessment of the effectiveness of the watershed urban runoff management programs. This is appropriate, since implementation of TMDL BMP Implementation Plans is similar to implementation of watershed urban runoff management programs.

Section I.5 (Long-Term Effectiveness Assessment) requires the Copermittees to conduct a Long-Term Effectiveness Assessment prior to their submittal of an application for reissuance of the Order. The Long-Term Effectiveness Assessment is necessary to provide support for the Copermittees' proposed changes to their programs in their ROWD. It can also serve as the basis for changes to the Order's requirements. The Copermittees recommend that the Order include a requirement for development of a Long-Term Effectiveness Assessment in their ROWD.[230]

J. Reporting

The following legal authority applies to section J:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part

[230] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-82.

must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Section J.1 (Jurisdictional Urban Runoff Management Plans) outlines the information to be included in the Copermittees' JURMPs. It utilizes an approach similar to the approach used in Order No. 2001-01. The information to be included in the JURMP is listed in detail in Attachment D. Significant detail is included in the Order regarding what information should be in the JURMPs in order to provide certainty to the Copermittees when they develop and submit their JURMPs. By providing detail for what information should be included in the JURMP, time spent by the Copermittees and Regional Board on JURMP reporting, review, comment, and response is expected to be reduced.

It is important to note that in many cases, the requirements of the Order should not necessitate a complete rewrite of the JURMPs. Only sections of the Order which are new or have been significantly changed should warrant rewriting of JURMP sections. The Regional Board plans to work with the Copermittees and provide guidance regarding where JURMPs must be updated in accordance with the Order. This will help ensure that rewriting, reporting, and review efforts are minimized.

Sections J.2 and J.3 (Watershed and Regional Urban Runoff Management Plans) include requirements for information to be included in the WURMPs and RURMP that are similar in scope to the requirements for information to be included in the JURMPs (section J.1). Please see the discussion for section J.1 for further information.

Section J.4 (Hydromodification Plan) requires various submittals during the development of the HMP. These submittals are necessary to provide both the Copermittees and the Regional Board the opportunity to review progress being made on the HMP. Frequent review of the HMP as it develops is needed due to the complex nature of the issues the HMP will address. The HMP submittal process included in the Order is based on a successful HMP submittal process previously implemented in the San Francisco Bay Area.

The final HMP requires approval by the Regional Board. Final approval by the Regional Board is necessary because the HMP requirements are new and relatively complex. Full vetting of the HMP before the Regional Board will provide all interested parties the opportunity to participate on HMP development and help ensure a workable end product for the interested parties.

Section J.6 (Report of Waste Discharge) requires submittal of a ROWD prior to the expiration of the Order. The section identifies the minimum information to be included in the ROWD, based

on USEPA's May 17, 1996 guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems."

K. Modifications of Programs

The following legal authority applies to section K:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Section K of the Order provides a process for the Copermittees to modify their urban runoff management programs. This process will be useful so that the Copermittees can continue to refine and improve their programs based on the findings of their annual program effectiveness assessments. The process allows for minor modifications to the Copermittees' programs where the Copermittees can exhibit that the modifications meet or exceed existing legal requirements under the Order. Such a process avoids lengthy and time consuming formal approvals of proposed modifications before the Regional Board, while still ensuring compliance with applicable legal standards and the Order. The Copermittees requested inclusion of a process in the Order to allow for minor modifications to their urban runoff management programs in their ROWD.[231] The process included in the Order is based on a process utilized by the San Francisco Bay Area Regional Water Quality Control Board in their MS4 permit for Alameda County.[232]

L. All Copermittee Collaboration

The following legal authority applies to section L:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

No significant changes were made to this section.

M. Principal Permittee Responsibilities

The following legal authority applies to section M:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(iii)(C) provides that "A regional authority may be responsible for submitting a permit application."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the

[231] San Diego County Copermittees, 2005. Report of Waste Discharge. P. C-10.
[232] San Francisco Bay Area Regional Water Quality Control Board, 2003. Order No. R2-2003-0021. P. 45.

contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

No significant changes were made to this section.

N. Receiving Waters Monitoring and Reporting Program

The following legal authority applies to section N:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Copermittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.26(d)(2)(iii).

See section V of this Fact Sheet/Technical Report for a discussion of changes to the Receiving Waters Monitoring and Reporting Program.

O. Standard Provisions, Reporting Requirements, and Notifications

The following legal authority applies to section O:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Section O.2 of the Order has been changed to remove the statement that all plans and reports submitted in compliance with the Order are an enforceable part of the Order. This statement has been removed because it is unnecessary. 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. Implementation by the Copermittees of programs in compliance with the Order's requirements, prohibitions, and receiving water limits is the pertinent compliance standard to be used under the Order, as opposed to assessing compliance by reviewing the Copermittees' implementation of their plans alone.

Rather than being substantive components of the Order itself, the Copermittees' urban runoff management plans are simply descriptions of their urban runoff management programs required under the Order. These plans serve as procedural correspondence which guides program implementation and aids the Copermittees and Regional Board in tracking implementation of the programs. In this manner, the plans are not functional equivalents of the Order. For these reasons, the Copermittees' urban runoff management plans need not be an enforceable part of the Order.

P. Attachment A

The following legal authority applies to Attachment A:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the SDRWQCB implement the Basin Plan.

No significant changes were made to this attachment.

Q. Attachment B

The following legal authority applies to Attachment B:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Attachment B includes Standard Provisions which have been developed by the SWRCB. These Standard Provisions ensure that NPDES permits are consistent and compatible with USEPA's federal regulations. Some Standard Provisions sections specific to publicly owned sewage treatment works are not included in Attachment B.

R. Attachment C

The following legal authority applies to Attachment C:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Attachment C contains definitions for new terms found in the Order. In addition, definitions for terms previously defined in Order No. 2001-01 Attachment D, but which are not found in the current Order, have been deleted.

S. Attachment D

The following legal authority applies to Attachment D:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Please see the discussion for section J.1 for further information.

T. Attachment E

The following legal authority applies to Attachment E:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Attachment E to the Order outlines the information to be included in the Copermittees' Jurisdictional Urban Runoff Management Program Annual Reports. Significant detail is included in the attachment regarding what information should be in the annual reports in order to provide certainty to the Copermittees when they develop and submit their annual reports. By providing detail for what information should be included in the annual reports, time spent by the Copermittees and Regional Board to generate, review, and comment on annual reports should be reduced.

U. Attachment F

The following legal authority applies to Attachment F:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under §

122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Attachment F to the Order provides a table summary of scheduled submittals required by the Order. Unscheduled submittals are no longer added to the table, since there is no proper due date for such submittals. A task summary has not been created for the Order, since the previous task summary was found to be redundant, repeating information found in the submittal summary and elsewhere in the Order.

V. Receiving Waters Monitoring and Urban Runoff Reporting Program

The following legal authority applies to the Receiving Waters Monitoring and Urban Runoff Reporting Program:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Copermittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.26(d)(2)(iii).

Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

1. Purpose

According to USEPA, the benefits of sampling data include, but are not limited to:

1. Providing a means for evaluating the environmental risk of storm water discharges by identifying types and amounts of pollutants present;

2. Determining the relative potential for storm water discharges to contribute to water quality impacts or water quality standard violations;
3. Identifying potential sources of pollutants; and
4. Eliminating or controlling identified sources more specifically through permit conditions.[233]

Equally important, monitoring programs are an essential link in the improvement of urban runoff management efforts. Data collected from monitoring programs can be assessed to determine the effectiveness of management programs and practices, which is vital for the success of the iterative approach used to meet the MEP standard. Specifically, when data indicates that a particular BMP or program component is not effective, improved efforts can be selected and implemented. Also, when water quality data indicate that water quality standards or objectives are being exceeded, particular pollutants, sources, and drainage areas can be identified and targeted for specific urban runoff management efforts.

Considering the benefits described above, the Receiving Waters Monitoring and Reporting Program (MRP) has been designed to determine impacts to receiving water quality and beneficial uses from urban runoff and to use the results to refine the Copermittees' urban runoff management programs for the reduction of pollutant loadings to the MEP. The primary goals of the MRP include:

1. Assess compliance with Order No. R9-2007-0001;
2. Measure and improve the effectiveness of the Copermittees' urban runoff management programs;
3. Assess the chemical, physical, and biological impacts of receiving waters from urban runoff;
4. Characterize urban runoff discharges;
5. Identify sources of specific pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions;
7. Detect and eliminate illicit discharges and illicit connections to the MS4; and
8. Assess the overall health of receiving waters.

Each of the components of the MRP is necessary to meet the objectives listed above. In addition, the MRP has been designed in accordance with the guidance provided by the Southern California Stormwater Monitoring Coalition's Model Monitoring Technical Committee in its August 2004 "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California." This guidance document was developed in response to Senate Bill 72 (Kuehl), which addressed the standardization of sampling and analysis protocols in municipal stormwater monitoring programs. The technical committee which developed the guidance included representatives from Southern California Regional Water Quality Control Boards (including San Diego), municipal storm water permittees (including the County of San Diego), Heal the Bay, and the Southern California Coastal Water Research Project.

As its title suggests, the guidance essentially developed a model municipal storm water monitoring program for use in Southern California. The model program is structured around five fundamental management questions, outlined below. The MRP is designed as an iterative step towards ensuring that the Copermittees' monitoring program can fully answer each of the five management questions.

[233] USEPA, 1992. NPDES Storm Water Sampling Guidance Document. EPA/833-B-92-001.

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

The justifications for each component of the monitoring program are discussed below.

2. Monitoring Program

Summary of Order No. 2001-01 Monitoring Program and Results

The Copermittees' monitoring under Order No. 2001-01 includes several components: (a) wet weather mass loading station monitoring (including toxicity monitoring); (b) bioassessment monitoring; (c) dry weather field screening and analytical monitoring; (d) coastal storm drain monitoring; and (e) ambient bay and lagoon monitoring. Each of these is briefly summarized below with recent results briefly discussed. The Copermittees' most recent monitoring report is available at:

http://www.projectcleanwater.org/html/wg_monitoring_04-05report.html.

Wet Weather Mass Loading Station Monitoring

The Copermittees' wet weather mass loading station monitoring consists of water quality monitoring during three storm events annually within the main drainage at the base of each major watershed in San Diego County. There are currently 11 wet weather mass loading stations throughout San Diego County, where various constituents of concern, bacterial indicators, and toxicological impacts are measured. Using data collected from the wet weather mass loading stations, persistent wet weather constituents of concern have been identified by the Copermittees in their Baseline Long-Term Effectiveness Assessment document. Persistent wet weather constituents of concern are generally those constituents which have concentrations which persistently exceed water quality objectives. Increasing and decreasing trends in constituent concentrations have also been identified by the Copermittees.

Mass Loading Station Persistent Wet Weather Constituents and Trends[234]

Mass Loading Stations	Persistent Wet Weather Constituents of Concern	Significant Trends Observed
Santa Margarita	Fecal Coliform Total Suspended Solids Turbidity	
San Luis Rey	Total Dissolved Solids	
Agua Hedionda	Fecal Coliform Total Dissolved Solids Total Suspended Solids Turbidity	Increasing chemical oxygen demand Increasing total kjeldahl nitrogen Increasing total phosphorus Increasing total suspended solids Increasing turbidity
Escondido Creek	Fecal Coliform Total Dissolved Solids Turbidity	

[234] San Diego County Copermittees, 2005. Baseline Long-Term Effectiveness Assessment.

San Dieguito River	Total Dissolved Solids	
Penasquitos River	Total Dissolved Solids	
Tecolote Creek	Fecal Coliform Turbidity Diazinon	Increasing arsenic (still below water quality objective) Decreasing total suspended solids Decreasing total zinc
San Diego River	Fecal Coliform	
Chollas Creek	Fecal Coliform Total Suspended Solids Turbidity Diazinon Copper Zinc Toxicity (Ceriodaphnia and Hyalella)	Increasing nitrate Increasing lead Decreasing total suspended solids Decreasing total dissolved solids Decreasing nickel
Sweetwater River	Total Dissolved Solids Fecal Coliform Diazinon	
Tijuana River	Fecal Coliform Ammonia Biochemical Oxygen Demand Chemical Oxygen Demand Total Phosphorus Total Suspended Solids Turbidity Chlorpyrifos Diazinon Malathion Toxicity (Ceriodaphnia)	

Bioassessment Monitoring

Bioassessment monitoring is conducted to provide site-specific information about the health and diversity of freshwater benthic communities within a specific reach of a creek. It consists of collecting samples of the benthic communities during dry weather and conducting a taxonomic identification to measure community abundance and diversity. Benthic community abundance and diversity is then compared to a reference creek to assess benthic community health. Under Order No. 2001-01, the Copermittees are required to conduct bioassessment monitoring on 23 stream reaches. The results from the Copermittees' bioassessment monitoring demonstrate that the beneficial uses of urban streams are being adversely impacted by urban runoff. The San Luis Rey, Carlsbad, San Dieguito, Penasquitos, Mission Bay, San Diego River, San Diego Bay, and Tijuana River watersheds all had Poor to Very Poor Index of Biotic Integrity ratings.[235]

Dry Weather Field Screening and Analytical Monitoring

The Copermittees conduct dry weather field screening and analytical monitoring throughout their jurisdictions at various locations within their MS4s. While a principal purpose of the dry weather field screening and analytical monitoring is to identify illicit discharges and/or connections to the MS4, the data gathered also provides useful information regarding water quality within the Copermittees' MS4s during dry weather conditions. Data from dry weather field screening and

[235] San Diego County Municipal Copermittees, 2005. 2004-2005 Urban Runoff Monitoring Final Report. Executive Summary.

analytical monitoring is often used effectively to identify and abate illicit discharges, but it also indicates high levels of pollutants in the Copermittees' MS4s. The number of exceedances of water quality criteria for various constituents at dry weather field screening and analytical monitoring sites frequently exceeds the number monitoring site visits conducted.[236]

Coastal Storm Drain Monitoring

Coastal storm drain monitoring involves monitoring discharges from coastal storm drains and nearby receiving waters for bacterial indicators. Approximately 59 coastal storm drains are monitored year round on a weekly or monthly basis, depending on the season. For samples collected in receiving waters, total coliform, fecal coliform, and Enterococcus water quality standards were exceeded at a rate of 2.0%, 1.7%, and 4.4% respectively in 2003-2004. Counts of bacterial indicators in samples collected from coastal storm drain discharges greatly exceeded those of samples collected in receiving waters, but were not reported in relation to water quality standards.[237]

Ambient Bay and Lagoon Monitoring

To monitor ambient bay and lagoon conditions, the Copermittees focus on assessing bay and lagoon sediments where contaminants are most likely to be found. Monitoring is conducted in twelve coastal embayments for various constituents, toxicity, and benthic infauna. Most of the embayments monitored were found to contain toxic elements in their sediment. However, this monitoring did occur in embayment areas targeted because of their likelihood to contain contaminated sediment, essentially representing worst-case scenarios.[238]

Mass Loading Station Monitoring

Section II.A.1 of the MRP requires mass loading and toxicity monitoring at monitoring stations located at the bottom of major watersheds within San Diego County. The mass loading monitoring will provide data representing event mean concentrations of pollutants, total pollutant loadings, and toxicity conditions from specific drainage areas. Mass loading monitoring stations are recommended by the Model Monitoring Technical Committee in order to answer management questions 1, 2, and 5.[239] The stations are also expected to contribute towards meeting MRP goals 1, 2, 3, 4, 6, and 8. The mass loading station monitoring included in the MRP is the same as the mass loading station monitoring proposed by the Copermittees in their ROWD.[240]

Sections II.A.1.a and II.A.1.b of the MRP identify the location of the mass loading stations and the frequency of the monitoring to be conducted at the mass loading stations. The locations of the stations are identical to the locations utilized under Order No. 2001-01, and match the locations proposed by the Copermittees in their ROWD.[241] These locations provide substantial coverage of the major watersheds within the San Diego Region portion of San Diego County.

The frequency of monitoring at the mass loading stations has been changed from monitoring each station for three wet weather events every year to monitoring each station for two wet weather

[236] Ibid. Sections 4-12.
[237] Ibid. Attachment A.
[238] Ibid. Executive Summary.
[239] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Chapter 5.
[240] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 9.
[241] Ibid. Attachment 3, p. 9.

and two dry weather monitoring events every other year. While this is an overall reduced frequency of monitoring at the mass loading stations, it is replaced by the addition of new monitoring stations to be located in the upper watersheds (called temporary watershed assessment stations). The new information generated from the temporary watershed assessment stations, as well as from new monitoring of dry weather events, offsets the reduced amount of information gathered at mass loading stations resulting from the monitoring of fewer wet weather events.

In their ROWD, the Copermittees statistically compared the Order No. 2001-01 monitoring program with the proposed program in order to determine any loss in the ability to observe trends resulting from the reduced wet weather monitoring frequency. The Copermittees' statistical assessments utilized empirical data from the existing monitoring program and used existing trends to predict or model the future data sets to estimate when water quality objectives would be reached assuming that current trends continue. The Copermittees found that "depending upon the current rate of decrease in observed concentration and variability of constituents, the ability to observe trends will not change significantly with the recommended program."[242] Using an example worst case scenario of a data exhibiting a non-significant downward trend (copper in Tecolote Creek), it was estimated that the frequency of monitoring conducted under Order No. 2001-01 would not exhibit concentrations below the water quality objective with 95% confidence for 18 years. Using the frequency of monitoring included in the MRP, however, it would take 22 years to see the same results - a relatively modest increase. The Copermittees further considered the ability to identify statistically significant differences between watersheds or between years when data from only two wet weather events is collected, as opposed to three events. Again, the Copermittees found that results are similar whether two wet weather events or three are monitored.[243]

While the reduction in the frequency of monitoring of wet weather events will certainly impact the ability to observe statistically significant trends and differences to some extent, the new MRP will advance the understanding of conditions in San Diego County watersheds. Segmenting the watershed and adding new temporary watershed assessment stations will provide additional watershed information relative to magnitude and extent, as well as increased spatial coverage to focus management efforts. Moreover, the MRP provides a more comprehensive temporal view of the watershed with the addition of dry weather monitoring, which will improve the Copermittees' ability to complete the pollutant loading picture.[244]

Sections II.A.1.c-f of the MRP include requirements that standard sampling and analysis protocols are followed by the Copermittees during monitoring. These are generally the same requirements included in Order No. 2001-01.

Section II.A.1.g of the MRP lists the constituents to be monitored at mass loading stations and temporary watershed assessment stations. These constituents have not changed from the constituents monitored under Order No. 2001-01.

Section II.A.1.h of the MRP requires the analysis of several additional constituents at stations in the Chollas Creek watershed. These constituents are required for analysis to assess the contribution of urban runoff to the Toxic Hot Spot at the mouth of Chollas Creek. The requirement for this analysis is consistent with the SWRCB's June 1999 Consolidated Toxic Hot Spot Cleanup Plan.

[242] Ibid. Attachment 3, p. 14.
[243] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, Appendix A, p. 2-5.
[244] Ibid. Attachment 3, p. 18.

Sections II.A.1.i-j of the MRP identify the toxicity testing to be implemented and require that standard toxicity testing procedures be followed during the testing. These toxicity testing requirements have not changed for the toxicity testing requirements of Order No. 2001-01.

Temporary Watershed Assessment Station Monitoring

Section II.A.2.a of the MRP identifies the number of temporary watershed assessment stations to be monitored in a given year for each watershed. Temporary watershed assessment stations will serve to segment watersheds, providing information on sub-watersheds which have previously not been monitored extensively. This will aid in the identification of water quality problem areas and help identify sources. Temporary watershed assessment stations are recommended by the Model Monitoring Technical Committee in order to answer management questions 1, 2, 3, and 5.[245] The stations are also expected to contribute towards meeting MRP goals 1, 2, 3, 4, 5, 6, and 8.

The section allows for the number of stations within a watershed to change, as long as the total number of stations monitored is not reduced. The number and watershed location of the stations and the frequency that they are to be monitored matches the Copermittees' proposal in their ROWD.[246] However, the location of the stations within each watershed is critical in terms of determining the monitoring program's effectiveness. If correctly sited, the stations are expected to be very useful in answering the program's management questions and meeting the program's goals. For this reason, the MRP includes requirements to guide where the stations are located. This will help maximize the utility of the stations, while also providing the Copermittees with adequate flexibility to ultimately choose the locations of the stations. The requirements for locating the stations is based on recommendations made by USEPA's contractor Tetra Tech during its review of the Copermittees' monitoring program proposal.[247]

Section II.A.2.b of the MRP identifies the required frequency of monitoring of temporary watershed assessment stations in a given year. The stations will be monitored with the same frequency as the mass loading stations. This frequency was proposed by the Copermittees in their ROWD.[248] The frequency of monitoring is appropriate for the same reasons it is appropriate at the mass loading stations (see the discussion for sections II.A.1.a and II.A.1.b).

Section II.A.2.c of the MRP requires temporary watershed assessment stations to be monitored in the same manner as mass loading stations, in terms of procedures, protocols, analysis, etc.

Bioassessment Monitoring

Section II.A.3 of the MRP requires the Copermittees to conduct bioassessment monitoring. Bioassessment monitoring is a cost-effective tool that measures the effects of water quality over time.[249] It is an important indicator of stream health and impacts from urban runoff. It can detect impacts that chemical and toxicity monitoring cannot. USEPA encourages permitting authorities to consider requiring biological monitoring methods to fully characterize the nature and extent of

[245] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Chapter 5.
[246] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 12.
[247] Tetra Tech, Inc., 2006. Review of San Diego County MS4 Monitoring Program. P. 13.
[248] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 12.
[249] California Department of Fish and Game, 2002. California Regional Water Quality Control Board, San Diego Region 2002 Biological Assessment Report: Results of May 2001 Reference Site Study and Preliminary Index of Biotic Integrity.

impacts from urban runoff.[250] Therefore, the Regional Board commonly requires bioassessment monitoring in MS4 and other types of discharge permits.

Bioassessment is the direct measurement of the biological condition, physical condition, and attainment of beneficial uses of receiving waters (typically using benthic macroinvertebrates, periphyton, and fish). Bioassessment monitoring integrates the effects of both water chemistry and physical habitat impacts (e.g., sedimentation or erosion) of various discharges on the biological community native to the receiving waters. Moreover, bioassessment is a direct measurement of the impact of cumulative, sub-lethal doses of pollutants that may be below reasonable water chemistry detection limits, but that still have biological affects.

Because bioassessment focuses on communities of living organisms as integrators of cumulative impacts resulting from water quality or habitat degradation, it defines the ecological risks resulting from urban runoff. Bioassessment not only identifies that an impact has occurred, but also measures the effect of the impact and tracks recovery when control or restoration measures have been taken. These features make bioassessment a powerful tool to assess compliance, evaluate the effectiveness of BMPs, and to track both short and long-term trends (MRP goals 1,2,3, and 8). Bioassessment can also help answer management questions 1, 2, and 5.

Section II.A.3.a of the MRP specifies the number of bioassessment stations to be monitored and their watershed location. This specification is consistent with Order No. 2001-01's bioassessment requirements and the Copermittees' ROWD.[251] This section also identifies the most current established protocol to be used in identifying bioassessment reference stations. The protocol referenced in the Order is specified because it provides a qualitative and repeatable method for identifying reference sites. Moreover, the protocol is well established, since it has been peer reviewed and published.

Section II.A.3.b of the MRP requires bioassessment stations to be collocated with mass loading and temporary watershed assessment stations. This improves the accuracy of the conclusions of the triad approach for a particular area, since all data will be collected from one location within a watershed, instead of several areas. This approach is recommended by the Copermittees in their ROWD.[252]

Section II.A.3.c of the MRP requires bioassessment monitoring to be conducted in May and October, which is a continuation of the standard practice conducted under Order No. 2001-01. Timing of bioassessment monitoring is also required to coincide with dry weather monitoring at mass loading and temporary watershed assessment stations. This improves the accuracy of the conclusions of the triad approach for particular time periods, since all data will be collected at specific times within a watershed, instead of at different times. This approach is recommended by the Copermittees in their ROWD.[253]

Section II.A.3.d of the MRP requires bioassessment monitoring to utilize the targeted riffle composite approach, which is consistent with the SWRCB's Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Management Plan (QAMP), as amended. Through SWAMP, various bioassessment methods were evaluated and it was found that the targeted riffle

[250] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. P. 2-5.
[251] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 12.
[252] Ibid. Attachment 3, p. 10.
[253] Ibid. Attachment 3, p. 10.

composite approach was a particularly efficient method, providing accurate data in a cost efficient manner.

Section II.A.3.e of the MRP requires bioassessment monitoring to include assessment of periphyton (algae). Advantages of bioassessment using periphyton include: (1) they have rapid reproduction rates and very short life cycles, making them valuable indicators of short-term impacts; (2) as primary producers, they are most directly affected by physical and chemical factors; (3) sampling is easy and inexpensive; and (4) algal assemblages are sensitive to some pollutants which may not visibly affect other aquatic assemblages.[254]

Section II.A.3.f of the MRP specifies an approach for calculation of an Index of Biotic Integrity for all bioassessment stations. The specified approach is consistent with USEPA's procedures for developing an Index of Biotic Integrity. The approach is also specified because it is highly repeatable and robust. In addition, the specified approach has previously been utilized by the Copermittees under Order No. 2001-01's requirements.

Section II.A.3.g of the MRP includes a standard requirement for a professional laboratory to perform the bioassessment procedures.

Follow-Up Analysis and Actions

Section II.A.4 of the MRP requires the Copermittees to use the results of the chemistry, toxicity, and bioassessment monitoring to determine if impacts from urban runoff are occurring and when follow-up actions are necessary. The triad approach allows a wide range of measurements to be combined to more efficiently identify pollutants, their sources, and appropriate follow-up actions. Results from the three types of monitoring shall be assessed to evaluate the extent and causes of pollution in receiving waters and to prioritize management actions to eliminate or reduce the sources. The framework provided in Table 3 is to be used to determine conclusions from the data and appropriate follow-up actions. The framework in Table 3 was derived from the Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California.[255] These follow-up actions are expected to primarily help answer management questions 2 and 4, as well as address MRP goals 2, 4, 5, 6 and 7.

When, based on the framework in Table 3, data indicates the presence of toxic pollutants in runoff, the Copermittees are required to conduct a Toxicity Identification Evaluation (TIE). A TIE is a set of procedures used to identify the specific chemical(s) responsible for toxicity to aquatic organisms. When discharges are toxic to a test organism, a TIE must be conducted to confirm potential constituents of concern and rule out others, therefore allowing Copermittees to determine and prioritize appropriate management actions. If a sample is toxic to more than one species, it is necessary to determine the toxicant(s) affecting each species. If the type and source of pollutants can be identified based on the data alone and an analysis of potential sources in the drainage area, a TIE is not necessary.

When a TIE identifies a pollutant associated with urban runoff as a cause of toxicity, it is then necessary to conduct follow-up actions to identify the causative agents of toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. Follow-up actions should analyze all potential source(s) causing toxicity,

[254] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. P. 3-3.
[255] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. P. 5-61.

potential BMPs to eliminate or reduce the pollutants causing toxicity, and suggested monitoring to demonstrate that toxicity has been removed.

Ambient Bay and Lagoon Monitoring

Sections II.A.5.a-c of the MRP requires to Copermittees to conduct monitoring of the ambient conditions of bays, lagoons, and similar waters. Focused monitoring on these resources is needed because of their uniqueness and the high value of their beneficial uses. Such monitoring is recommended by the Stormwater Monitoring Coalition's Model Monitoring Technical Committee.[256]

The MRP requires the Copermittees to assess the data collected for the bays and lagoons over the last three years and refocus the monitoring program based on the assessment conducted. If links between bay and lagoon conditions and mass loading stations are observed, monitoring is to be conducted in all bays and lagoons in order to gain a better understanding of this relationship. If such a linkage is not observed, special studies shall be conducted specific to the various bays and lagoons and the issues they face. The approach outlined in the MRP for the ambient bay and lagoon monitoring program is based on the proposal found in the Copermittees' ROWD.[257] It is expected to help answer management questions 1, 2, and 5, as well as address MRP goals 1, 2, 3, 6, and 8, with regards to bays and lagoons.

Section II.A.5.d of the MRP requires that ambient bay and lagoon monitoring utilize the triad approach for assessment of data. The triad approach links chemistry, toxicity, and bioassessment data to better identify and understand the causes of impacts to beneficial uses. This approach has previously been used by the Copermittees in their ambient bay and lagoon monitoring.[258]

Section II.A.5.e of the MRP requires monitoring of the water column in bays and lagoons as necessary to supply information needed for TMDLs. This requirement has been added to the MRP to better ensure that storm water and TMDL monitoring complement each other where possible. This is expected to improve the efficiency with which monitoring resources are used. The Copermittees support complementary storm water and TMDL efforts in their ROWD.[259]

Coastal Storm Drain Monitoring

Section II.A.6 of the MRP continues the Copermittees' coastal storm drain monitoring program in the same manner as it was conducted under Order No. 2001-01's receiving waters monitoring program. The coastal storm drain monitoring program outlined in the MRP is consistent with the Copermittees' proposal in their ROWD.[260] Coastal storm drain monitoring is critical because one of the primary impacts to coastal receiving waters is the loss of recreational beneficial uses resulting from high levels of bacteria in urban runoff. The coastal storm drain monitoring program is expected to help answer management questions 1, 2, 3, 4 and 5, as well as address MRP goals 1, 2, 3, 4, 5, 6, 7, and 8.

Sections II.A.6.a and II.A.6.b.(1) of the MRP require the Copermittees to identify all coastal storm drains and sample those that are flowing on a monthly basis. All coastal storm drains are

[256] Ibid. P. 5-38.
[257] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 10-12.
[258] San Diego County Copermittees, 2005. San Diego County Copermittees 2004-2005 Urban Runoff Monitoring Final Report. P. ES-2.
[259] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-10.
[260] Ibid. Attachment 4.

required to be part of the program; skipping certain storm drains simply because they are near other storm drains is inappropriate, since each storm drain can have significantly different conditions within its drainage area. One purpose of coastal storm drain monitoring is to identify and abate sources of bacterial contamination. Since the sources of bacterial contamination at a storm drain are generally not known, the potential for a flowing coastal storm drain to be discharging urban runoff with high levels of bacteria cannot be known unless the storm drain is monitored.

The requirement that all coastal storm drains be part of the program is offset by the reduction in sampling frequency to a monthly basis year round, instead of weekly in the summer and monthly in the winter. Moreover, the MRP allows sampling frequency to be further reduced when monitoring results indicate bacteria levels are consistently below an identified criteria. These reductions in sampling frequency are allowed because the Copermittees have found monthly monitoring to typically be representative of storm drain conditions. Also, the Copermittees have identified some storm drains which consistently have low levels of bacteria and do not cause exceedances of standards in receiving waters. Reduction in monitoring frequency provides the Copermittees with more time and resources to investigate problem storm drains, as required in MRP sections II.A.6.b.3-5. The monitoring frequencies in the MRP are recommended by the Copermittees in their ROWD.[261]

Section II.A.6.b.(2) of the MRP requires the Copermittees to notify the Regional Board if they are going to reduce the monitoring frequency of a coastal storm drain. This will allow the Regional Board the opportunity to review the proposed reduction prior to the reduction being enacted by the Copermittee.

Sections II.A.6.b.(3-5) of the MRP identifies when follow-up investigations must be conducted based on results of coastal storm drain monitoring. Criteria to trigger investigations is needed to ensure that problem storm drains are investigated. Without criteria triggering investigations, there is the potential that sources causing high bacteria levels in storms drains and coastal receiving waters could go uninvestigated.

Section II.A.6.b.(6) of the MRP requires the Copermittees to provide notification of exceedances of public health standards so that proper action can be taken by public health agencies.

Toxic Hot Spot Monitoring

Section II.A.7 of the MRP requires the Copermittees to develop and implement a monitoring program for Toxic Hot Spots in San Diego Bay. This requirement is identical to the requirement included in the receiving waters monitoring and reporting program for Order No. 2001-01, and is necessary to ensure the Order is consistent with the SWRCB's June 1999 Consolidated Toxic Hot Spot Cleanup Plan.

Pyrethroids Monitoring

Section II.A.8 of the MRP requires the Copermittees to develop and implement a monitoring program which addresses pyrethroids. A program to monitor pyrethroids is needed because they are the leading insecticides sold to homeowners and have been found at toxic levels in suburban

[261] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 4.

stream sediments in California when investigated.[262] Moreover, their use is likely to increase as diazinon use decreases. Monitoring of pyrethroids will help guide efforts to ensure that the gains achieved by the phasing out of diazinon are not nullified by increased use of pyrethroids.

Since a monitoring program for pyrethroids is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP to develop a program that is workable for them while providing the necessary information. Moreover, the MRP provides the Copermittees with over a year to develop the program.

Trash Monitoring

Section II.A 9 of the MRP requires the Copermittees to develop and implement a monitoring program which addresses trash. A program to monitor trash is needed because trash conditions impacting beneficial uses have frequently been observed within the Copermittees' jurisdictions. For example, the Regional Board directed the Copermittees within the watersheds of Chollas and Paleta Creeks to implement the "iterative process" to address violations of water quality standards due to trash conditions within the creeks.[263] The Regional Board also issued a Notice of Violation to the City of Escondido for trash conditions in Escondido Creek.[264] Moreover, the Copermittees have identified trash as a regional priority.[265]

Since a monitoring program for trash is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP to develop program that is workable for them while providing the necessary information. Moreover, the MRP provides the Copermittees with over a year to develop the program.

MS4 Discharge Monitoring

Section II.A.10 of the MRP requires the Copermittees to develop and implement a program to monitor and characterize pollutant discharges from MS4 outfalls. After over 15 years of program implementation, most Copermittees have not monitored their MS4 discharges significantly and still do not know the quality of those discharges during various conditions. Such monitoring is critical, since it will provide for prioritization of areas for increased management efforts. It will also provide the Copermittees the ability to better assess and improve their jurisdictional programs and BMPs. For example, the Copermittees' assessment framework calls for assessing changes in load reductions and MS4 discharge quality.[266] Monitoring of MS4 discharges will enable the Copermittees to meet these program assessment goals. Without monitoring of MS4 discharges, it is unclear how these program assessment goals will be met. This type of monitoring is recommended for high priority outfalls by the Stormwater Monitoring Coalitions' Model Monitoring Technical Committee.[267] It is expected to help answer management questions

[262] Science News Online, 2006. A Little Less Green? Studies Challenge the Benign Image of Pyrethroid Insecticides. www.sciencenews.org/articles/20060204/bob9/asp.
[263] Regional Board, 2001. California Water Code Section 13267 Directives Issued to the City of San Diego, City of La Mesa, City of Lemon Grove, and City of National City.
[264] Regional Board, 2000. Notice of Violation No. 2000-181.
[265] San Diego County Copermittees, 2005. Report of Waste Discharge. P. C-3.
[266] San Diego Municipal Stormwater Copermittees, 2003. A Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs. P. 14.
[267] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. P. 5-55.

3and 4, which is consistent with Tetra Tech's review of the Copermittees' monitoring proposal, which stated "give substantially more attention of questions 3 and 4."[268] It will also address MRP goals 1, 2, 4, 5, 6, and 7.

Since a monitoring program for MS4 discharges is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP to develop program that is workable for them while providing the necessary information. Moreover, the MRP provides the Copermittees with over a year to develop the program.

Source Identification Studies

Section II.A.11 of the MRP requires the Copermittees to develop and implement a program to identify sources of discharges of pollutants causing the high priority water quality problems within each watershed. Identification of sources causing high priority water quality problems is a central purpose of urban runoff management programs. Monitoring which enables the Copermittees to identify sources of water quality problems aids the Copermittees in focusing their management efforts and improving their programs. In turn, the Copermittees' programs can abate identified sources, which will improve the quality of urban runoff discharges and receiving waters. This monitoring is needed to address management question 4 (What are the sources to urban runoff that contribute to receiving water problems?). Source identification monitoring is a key component of the Model Monitoring Program, which states "once it has been determined […] that urban runoff is, or is likely to be, a significant source of one or more receiving water problems, then more intensive source identification efforts are called for."[269] Moreover, in its review of the Copermittees' monitoring proposal, Tetra Tech finds that "after some years of assessment monitoring, it is time to look more systematically at determining the relative urban contributions and the sources of urban runoff that contribute to identified receiving water problems."[270]

Since a monitoring program for source identification is mostly new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP to develop program that is workable for them while providing the necessary information. Moreover, the MRP provides the Copermittees with over a year to develop the program.

TMDL Monitoring

Section II.A.12 of the MRP requires the Copermittees to continue to monitor for TMDLs in Chollas Creek as required in the Regional Board's Investigation Order No. R9-2004-0277.

Regional Monitoring Program

Section II.B.1 of the MRP requires the Copermittees to conduct regional monitoring if directed by the Executive Officer. Such investigations may be required under CWC sections 13267 and 13383.

[268] Tetra Tech Inc., 2006. Review of San Diego County MS4 Monitoring Program. P. 15.
[269] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. P. 4-17.
[270] Tetra Tech Inc., 2006. Review of San Diego County MS4 Monitoring Program. P. 15.

Section II.B.2 of the MRP allows the Copermittees to participate in Bight '08. This will provide the Copermittees and Regional Board with insight on the impact of urban runoff on a regional level in the Southern California Bight. Participation in Bight '08 was recommended by the Copermittees in their ROWD.[271] Since participation in Bight '08 is optional for the Copermittees, this section outlines the monitoring which must be conducted if the Copermittees do not participate in the study. The monitoring the Copermittees are to conduct if they do not participate in Bight '08 is consistent with the monitoring they are required to conduct in other years.

Special Studies

Section II.C of the MRP requires the Copermittees to conduct special investigations if directed by the Executive Officer. Such investigations may be required under California Water Code sections 13267 and 13383.

Dry Weather Field Screening and Analytical Monitoring

Section II.D of the MRP requires the Copermittees to conduct dry weather field screening and analytical monitoring. In general, the Order's requirements are the same as the dry weather monitoring requirements of Order No. 2001-01. Significant changes in the requirements are discussed below.

Section II.D.1 of the MRP requires the Copermittees to select dry weather monitoring stations to cover the entire MS4 system, as well as be in compliance with minimum guidelines/criteria. These criteria require a minimum number of stations per square mile. Additional language has been added to provide the Copermittees flexibility in providing equivalent coverage of the MS4 with fewer stations.

In its October 29, 2004 letter to the Copermittees, as well as in subsequent meetings, the Regional Board notified the Copermittees that a process should be developed for determining the minimum number of dry weather sampling stations that should be required in each jurisdiction. The process was needed due to the apparent disparity in the number of sampling stations among the Copermittees. The Copermittees formed a subcommittee to address this issue, but were unable to develop a consensus process. As a result, the Copermittees have requested that a standardized method for determining number of dry monitoring stations not be included in the Order. In response, the Regional Board has relied on Order No. 2001-01's requirements and some additional clarifying language. This continues Order No. 2001-01's process for identifying the number of stations, while allowing the Regional Board to evaluate the adequacy of the each Copermittee's number of dry weather stations.

Order No. 2001-01's requirement for a monitoring map (Task 5) has been moved to the Illicit Discharge Detection and Elimination Component of Order No. R9-2007-0001. This has been done for clarification purposes, since map development is not expressly a monitoring effort.

Section II.D.3 of the MRP requires the Copermittees to collect and analyze dry weather samples using laboratory or field screening methods. Language to has been added to this section to reflect that the Copermittees must collect samples for analytical laboratory analysis for at least 25% of dry weather monitoring stations.

[271] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 12.

In the ROWD, the Copermittees requested field screening be allowed for surfactants and dissolved copper constituents. The Copermittees also requested that Colilert and Enterolert methods should be allowed for bacteria sampling. The Regional Board agrees with the Copermittees' proposed changes since they will expedite the turnaround time for sampling results for these constituents and assist the Copermittees in their IC/ID investigations. In response the Copermittees' request, surfactants and dissolved copper have been added to the list of field screening constituents. A footnote has also been added allowing for use of Colilert and Enterolert methods for bacteria.

Monitoring Provisions

Section II.E of the MRP includes monitoring provisions which are standard requirements for all municipal storm water permits.

3. Reporting Program

Section III.1 of the MRP discusses submittal of the Jurisdictional Urban Runoff Management Program Annual Reports. The section continues the approach utilized under the requirements of Order No. 2001-01, where Copermittees submit their reports to the Principal Permittee to be unified into one document. The section moves forward the due date for these annual reports from January 31 to September 30. This requires jurisdictional annual reports to be submitted closer to the end of the reporting period they address, which will result in earlier review by the Regional Board. Submittal will also be staggered with submittal of the watershed and regional annual reports, spreading out Regional Board review of annual reports, leading to faster review. Earlier and faster review is useful, because Regional Board comments can be received and responded to quicker by the Copermittees. In this manner, Copermittee programs can be modified and benefit from the jurisdictional annual report review, comment, response process at an earlier date, leading to more effective program over the long-term. In their ROWD, the Copermittees agree that separating due dates for jurisdictional and watershed annual reports would be helpful in spreading out the workload associated with their preparation.[272]

Sections III.2.a and III.2.c of the MRP continues the reporting approach utilized under the requirements of Order No. 2001-01, where Lead Permittees for each watershed submit their annual reports to the Principal Permittee to be unified into one document.

Section III.2.b of the MRP outlines the information to be included in the Copermittees' Watershed Urban Runoff Management Program Annual Reports. Significant detail is included regarding what information should be in the annual reports in order to provide certainty to the Copermittees when they develop and submit their annual reports. By providing detail for what information should be included in the annual reports, time spent by the Copermittees and Regional Board to generate, review, and comment on annual reports should be reduced.

Section III.3 of the MRP outlines the information to be included in the Copermittees' RURMP Annual Reports. Significant detail is included regarding what information should be in the annual reports in order to provide certainty to the Copermittees when they develop and submit their annual reports. By providing detail for what information should be included in the annual reports, time spent by the Copermittees and Regional Board to generate, review, and comment on annual reports should be reduced.

[272] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-81.

Section III.4.a of the MRP requires the Copermittees to annually submit a description of the monitoring that will be conducted prior to the start of each monitoring year. This is needed because of the changes the monitoring program frequently undergoes each year. For example, as monitoring programs develop, some monitoring components of the programs are added or dropped. In addition, requirements for conducting monitoring efforts such as TIEs may be applicable. A description of the monitoring to be conducted each year will aid the Regional Board and Copermittees in tracking monitoring activities and compliance with the MRP.

Section III.4.b of the MRP outlines the information to be included in the Copermittees' Receiving Waters Monitoring Annual Reports. The information required to be included in the reports is needed to meet the goals of the MRP and answer the MRP's management questions. The reporting requirements emphasize identifying and assessing the impact of urban runoff on receiving water quality, as well as the impact of the Copermittees' programs on urban runoff quality. Significant detail is included regarding what information should be in the annual reports in order to provide certainty to the Copermittees when they develop and submit their annual reports. By providing detail for what information should be included in the annual reports, time spent by the Copermittees and Regional Board to generate, review, and comment on annual reports should be reduced.

Section III.4.c of the MRP requires the Copermittees to submit a description of the new monitoring programs to be developed under the MRP. Submittal of such a document is necessary in order to identify the monitoring that will be conducted and provide the Regional Board the opportunity to review the monitoring programs.

Section III.4.d of the MRP requires the City of San Diego to report on the Shelter Island Yacht Basin TMDL in order to exhibit that the WLA can be expected to continue to be met. This report is necessary, since MS4 discharge monitoring is not required by the TMDL.

Section III.4.e of the MRP requires that monitoring programs comply with standard provisions, notifications, and reporting requirements.

Section III.4.f of the MRP requires that the Copermittees make data available to the Regional Board during report preparation, if requested. This is a necessary option since monitoring annual reports are not submitted for many months after much of the monitoring data is collected.

Section III.5 of the MRP allows for the Copermittees to develop and submit a reporting format for annual report integration. In their ROWD, the Copermittees requested a requirement that annual reporting ultimately be integrated.[273] Rather than including annual report integration as a requirement in the Order, it is included as an option for the Copermittees to utilize. Annual report integration is left as an option because information addressing what such integration would encompass is largely unknown. Annual reporting is an important tool for the Regional Board for compliance assessment. Where the outcomes regarding compliance assessment are uncertain, it is more appropriate to incorporate such concepts into the Order as options, instead of requirements. However, nothing in the Order prevents the Copermittees from developing an annual report integration format for Regional Board review and approval. To clarify Regional Board expectations for an annual report integration format, minimum standards for the format are provided in the Order.

[273] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-77.

Section III.6 of the MRP includes universal reporting requirements, which have not changed from the requirements of Order No. 2001-01.

Section III.7 of the MRP clarifies that reporting should continue as it is conducted under Order No. 2001-01 until reporting requirements under Order No. R9-2007-0001 begin.

Item to be Reimbursed	**Proposed Reasonable Reimbursement Method**
Reporting on Street Sweeping and Conveyance System Cleaning (Part J.3.a.(3)(c) (iv)-(viii), (x)-(xv))	$Reimbursement = \sum_{t=2007}^{2013} [Conveyance\ Reporting\ Cost]_t + \sum_{t=2007}^{2013} [Sweeping\ Reporting\ Cost]_t$
Conveyance System Cleaning (Part D.3.a.(3)(b)(iii))	$Reimbursement = \sum_{t=2007}^{2015} [(Unit\ Cost)_S(\#S)]_t] + \sum_{t=2007}^{2015} [(Unit\ Cost)_P(P)]_t] + \sum_{t=2007}^{2015} [(Unit\ Cost)_C(C)]_t]$
Educational Component (Parts D.5.a.(1)-(2), D.5.b.(1)(a), D.5.b.(1)(b)(iii.-vi.), D.5.b.(1)(c), D.5.b.(1)(d), D.5.b.(2), D.5.b.(3))	$Reimbursement = \sum_{t=2007}^{2015} [(County\ Education\ Costs)(MOU)]_t + \sum_{t=2007}^{2015} [(Education\ Costs)(Total)]_t$
Watershed activities and collaboration in the Watershed Urban Runoff Management Program (Part E.2.f & E.2.g)	$Reimbursement = \sum_{t=2007}^{2013} [(Watershed\ Lead\ Costs)(MOUs)]_t + \sum_{t=2007}^{2013} [4 * Jurisdictional\ Activities]_t + \sum_{t=2007}^{2013} [(WURMP\ Costs)(MOU)]_t + \sum_{t=2007}^{2013} [(Rate)(\#\ Attendees)(\#\ Meetings)]_t$
Regional Urban Runoff Management Program (Parts F.1., F.2. & F.3)	$Reimbursement = \sum_{t=2007}^{2013} [(Cost\ Share)(MOU)]_t$
Program Effectiveness Assessment (Parts I.1 & I.2)	$Reimbursement = \sum_{t=2007}^{2013} [(Effectivness)(Total)]_t + \sum_{t=2007}^{2015} [(FRA\ Workgroup\ Costs)(MOU)]_t$
Long-term Effectiveness Assessment (Part I.5)	$Reimbursement = \sum_{t=2007}^{2013} [(Contractor\ Costs)(MOU)\ ]_t$
All Permittee Collaboration (Part L.1.a.(3)-(6))	$Reimbursement = \sum_{t=2007}^{2013} [(County\ Cost)(MOU)\ ]_t + \sum_{t=2007}^{2013} [(Rate)(\#\ Meeting\ Attendances)]_t + \sum_{t=2007}^{2017} [(Workgroup\ Cost\ )(MOU)]_t$

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. 2001-01

NPDES NO. CAS0108758

WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES OF URBAN RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF THE COUNTY OF SAN DIEGO, THE INCORPORATED CITIES OF SAN DIEGO COUNTY, AND THE SAN DIEGO UNIFIED PORT DISTRICT

The California Regional Water Quality Control Board, San Diego Region (hereinafter SDRWQCB), finds that:

1. **COPERMITTEES ARE DISCHARGERS OF URBAN RUNOFF:** Each of the persons in Table 1 below, hereinafter called Copermittees or dischargers, owns or operates a municipal separate storm sewer system (MS4), through which it discharges urban runoff into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Table 1. Municipal Copermittees

1.	City of Carlsbad	11.	City of National City
2.	City of Chula Vista	12.	City of Oceanside
3.	City of Coronado	13.	City of Poway
4.	City of Del Mar	14.	City of San Diego
5.	City of El Cajon	15.	City of San Marcos
6.	City of Encinitas	16.	City of Santee
7.	City of Escondido	17.	City of Solana Beach
8.	City of Imperial Beach	18.	City of Vista
9.	City of La Mesa	19.	County of San Diego
10.	City of Lemon Grove	20.	San Diego Unified Port District

2. **URBAN RUNOFF CONTAINS "WASTE" AND "POLLUTANTS":** Urban runoff contains waste, as defined in the California Water Code, and pollutants, as defined in the federal Clean Water Act, and adversely affects the quality of the waters of the State.

3. **URBAN DEVELOPMENT AND RUNOFF CAUSES RECEIVING WATER DEGRADATION:** Urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. As runoff flows over urban areas, it picks up harmful pollutants such as pathogens, sediment (resulting from human activities), fertilizers, pesticides, heavy metals, and petroleum products. These pollutants often become dissolved or suspended in urban runoff and are conveyed and discharged to receiving waters, such as streams, lakes, lagoons, bays, and the ocean without treatment. Once in receiving waters, these pollutants harm aquatic life primarily through toxicity and habitat degradation. Furthermore, the pollutants can enter the food chain and may eventually enter the tissues of fish and humans.

There is a strong direct correlation between "urbanization" and "impacts to receiving water quality". In general, the more heavily developed the area, the greater the impacts to receiving waters from urban runoff.

These impacts especially threaten environmentally sensitive areas (such as Clean Water Act section 303(d) impaired water bodies, areas designated as Areas of Special Biological Significance, water bodies designated with the RARE beneficial use, and preserves containing receiving waters designated under the Multi Species Conservation Program within the Cities and County of San Diego). Such environmentally sensitive areas have a much lower capacity to withstand pollutant shocks than might be acceptable in the general circumstance. In essence, urban development that is ordinarily insignificant in its impact on the environment may, in a particularly sensitive environment, be significant.

4. **URBAN DEVELOPMENT INCREASES POLLUTANT LOAD, VOLUME, AND VELOCITY OF RUNOFF:** During urban development two important changes occur. First, natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots. Natural vegetated soil can both absorb rainwater and remove pollutants providing a very effective natural purification process. Because pavement and concrete can neither absorb water nor remove pollutants, the natural purification characteristics of the land are lost.

   Secondly, urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4.

   As a result of these two changes, the runoff leaving the developed urban area is significantly greater in volume, velocity and pollutant load than the pre-development runoff from the same area.

   The significance of the impacts of urban development on receiving waters is determined by the scope of the project, such as the size of the project, the project land-use type, etc. Large projects (such as commercial developments greater than 100,000 square feet, home subdivisions greater than 10 units, and streets, roads, highways, and freeways) generally have large amounts of impervious surface, and therefore have greater potential to significantly impact receiving waters by increasing erosion (through increased peak flow rates, flow velocities, flow volumes, and flow durations) than smaller projects. Projects of particular land use types also have greater potential to significantly impact receiving waters due to the presence of typically large amounts of pollutants on site or an increased potential for pollutants to move off site (such as automotive repair shops, restaurants, parking lots, streets, roads, highways, and freeways, hillside development, and retail gasoline outlets).

5. **WATER QUALITY DEGRADATION INCREASES WITH PERCENT IMPERVIOUSNESS:** The increased volume and velocity of runoff from developed urban areas greatly accelerates the erosion of downstream natural channels. Numerous studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of its receiving water quality. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 10% conversion from natural to impervious surfaces. (Developments of medium density single family homes range between 25 to 60% impervious). Today "% impervious coverage" is believed to be a reliable indicator and predictor of the water quality degradation expected from planned new development.

6. **URBAN RUNOFF IS A HUMAN HEALTH THREAT:** Urban runoff contains pollutants, which threaten human health. Human illnesses have been clearly linked to recreating (i.e.,

swimming, surfing, etc.) near storm drains flowing to coastal beach waters. Such flows from urban areas often result in the posting or closure of local beaches.

Pollutants transported to receiving waters by urban runoff can also enter the food chain. Once in the food chain they can "bioaccumulate" in the tissues of invertebrates (e.g., mussels, oysters, and lobsters) and fish which may be eventually consumed by humans. Furthermore, some pollutants are also known to "biomagnify". This phenomenon can result in pollutant concentrations in the body fat of top predators that are millions of times greater than the concentrations in the tissues of their lower trophic (food chain) counterparts or in ambient waters.

7. **POLLUTANT TYPES:** The most common categories of pollutants in urban runoff include total suspended solids, sediment (due to anthropogenic activities); pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.

8. **URBAN STREAMS AS AN MS4 COMPONENT:** Historic and current development make use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially modified features. In these cases, the urban stream is both an MS4 and a receiving water.

9. **URBAN RUNOFF CAUSES BENEFICIAL USE IMPAIRMENT**: Individually and in combination, the discharge of pollutants and increased flows from MS4s can cause or threaten to cause a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance. The discharge of pollutants from MS4s can cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses.

10. **COPERMITTEES IMPLEMENT URBAN RUNOFF MANAGEMENT PROGRAMS (URMPs):** Copermittee implementation of Urban Runoff Management Programs (URMPs) designed to reduce discharges of pollutants and flow into and from MS4s to the maximum extent practicable (MEP) can protect receiving water quality by promoting attainment of water quality objectives necessary to support designated beneficial uses. To be most effective, URMPs must contain both structural and non-structural best management practices (BMPs).

11. **BEST MANAGEMENT PRACTICES (BMPs):** Pollutants can be effectively reduced in urban runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control (or structural) BMPs remove pollutants from urban runoff. Where feasible, use of BMPs which utilize natural processes should be assessed. These types of BMPs, such as grassy swales and constructed wetlands, can frequently be as effective as less natural BMPs, while providing additional benefits such as aesthetics and habitat.

12. **POLLUTION PREVENTION**: Pollution prevention, the initial reduction/elimination of pollutant generation at its source, is the best "first line of defense" for Copermittees and should be used in conjunction with source control and treatment control BMPs. Pollutants that are never generated do not have to be controlled or treated. Encouragement during planning processes of the use of pollution prevention BMPs can be an effective means for pollution prevention BMPs to be implemented, through such methods as education, landscaping, etc.

13. **RECEIVING WATER LIMITATIONS:** Compliance with receiving water limits based on applicable water quality objectives is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality objectives and the creation of conditions of pollution.

14. **RECEIVING WATER LIMITATION COMPLIANCE STRATEGY**: Implementation of BMPs cannot ensure attainment of receiving water quality objectives under all circumstances; some BMPs may not prove to be as effective as anticipated. An iterative process of BMP development, implementation, monitoring, and assessment is necessary to assure that an Urban Runoff Management Program is sufficiently comprehensive and effective to achieve compliance with receiving water quality objectives.

15. **COPERMITTEES' RESPONSIBILITY FOR ILLICIT DISCHARGES FROM THIRD PARTIES:** As operators of MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to the waters of the United States, the operator of an MS4 that does not prohibit and/or control discharges into its system essentially accepts responsibility for those discharges.

16. **COPERMITTEES' RESPONSIBILITY BASED ON LAND USE AUTHORITY**: Utilizing their land use authority, Copermittees authorize and realize benefits from the urban development which generates the pollutants and runoff that impair receiving waters. Since the Copermittees utilize their legal authority to authorize urbanization, they must also exercise their legal authority to ensure that the resulting increased pollutant loads and flows do not further degrade receiving waters.

17. **THREE PHASES OF URBAN DEVELOPMENT**: Urban development has three major phases: (1) land use planning for new development; (2) construction; and (3) the "use" or existing development phase. Because the Copermittees authorize, permit, and profit from each of these phases, and because each phase has a profound impact on water quality, the Copermittees have commensurate responsibilities to protect water quality during each phase.

    In other words, Copermittees are held responsible for the short and long-term water quality consequences of their land use planning, construction, and existing development decisions.

18. **PLANNING PHASE FOR NEW DEVELOPMENT**: Because land use planning and zoning is where urban development is conceived, it is the phase in which the greatest and most cost-effective opportunities to protect water quality exists. When a Copermittee incorporates policies and principles designed to safeguard water resources into its General Plan and development project approval processes, it has taken a far-reaching step towards the preservation of local water resources for future generations.

19. **CONSTRUCTION PHASE**: Construction activities are a significant cause of receiving water impairment. Siltation is currently the largest cause of river impairment in the United States. Sediment runoff rates from construction sites greatly exceed natural erosion rates of undisturbed lands causing siltation and impairment of receiving waters. In addition to requiring implementation of the full range of BMPs, an effective construction runoff program must include local plan review, permit conditions, field inspections, and enforcement.

20. **EXISTING DEVELOPMENT:** The Copermittees' wet weather monitoring results collected during the past decade, as well as volumes of other references in the literature today, confirm substantial pollutant loads to receiving waters in runoff from existing urban development. Implementation of jurisdictional and watershed URMPs, which include extensive controls on existing development, can reduce pollutant loadings over the long term.

21. **CHANGES NEEDED**: Because the urbanization process is a direct and leading cause of water quality degradation in this Region, fundamental changes to existing policies and

practices about urban development are needed if the beneficial uses of San Diego's natural water resources are to be protected.

22. **DUAL REGULATION OF INDUSTRIAL AND CONSTRUCTION SITES:** Discharges of runoff from industrial and construction sites in this Region are subject to dual (state and local) regulation. (1) All industries and construction sites are subject to the local permits, plans, and ordinances of the municipal jurisdiction in which it is located. Pursuant to this Order, local (storm water, grading, construction, and use) permits, plans, and ordinances must (a) prohibit the discharge of pollutants and non-storm water into the MS4; and (b) require the routine use of BMPs to reduce pollutants in site runoff. (2) Many industries and construction sites are also subject to regulation under the statewide General Industrial Storm Water Permit or statewide General Construction Storm Water Permit[1]. These statewide general permits are adopted by the State Water Resources Control Board and enforced by the nine Regional Water Quality Control Boards throughout California. Like the Copermittees' local permits and ordinances, the statewide General Industrial and Construction Permits also (a) prohibit the discharge of pollutants and non-storm water; and (b) require the routine use of BMPs to reduce pollutants in site runoff.

    Recognizing that both authorities share a common goal, the federal storm water regulations at 40 CFR 122.26 (and its preamble) call for the dual system to ensure the most effective oversight of industrial and construction site discharges. Under this dual system, each municipal Copermittee is responsible for enforcing its local permits, plans, and ordinances within its jurisdiction. Similarly, the SDRWQCB is responsible for enforcing both statewide general permits and this Order within the San Diego Region.

23. **EDUCATION:** Education is the foundation of every effective URMP and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions impact receiving water quality and how these impacts can be minimized.

24. **ENFORCING LOCAL LEGAL AUTHORITY**: Enforcement of local urban runoff related ordinances, permits, and plans is an essential component of every URMP and is specifically required in the federal storm water regulations and this Order. Routine inspections provide an effective means by which Copermittees can evaluate compliance with their permits and ordinances. Inspections are especially important at high-risk areas for pollutant discharges such as industrial and construction sites.

    When industrial or construction site discharges occur in violation of local permits and ordinances, the SDRWQCB looks to the municipality that has authorized the discharge for appropriate actions (typically education followed by enforcement where education has been unsuccessful). Each Copermittee must also provide enforcement against illegal discharges from other land uses it has authorized, such as commercial and residential developments.

[1] The "statewide General Industrial Storm Water Permit" refers to State Water Resources Control Board Water Quality Order No. 97-03-DWQ National Pollutant Discharge Elimination System General Permit No. CAS000001, Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities. The "statewide General Construction Storm Water Permit" refers to State Water Resources Control Board Order No. 99-08-DWQ National Pollutant Discharge Elimination System General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity.

25. **PUBLIC PARTICIPATION:** Public participation during the URMP development process is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

26. **TOXICITY**: Urban runoff discharges from MS4s often contain pollutants that cause toxicity, (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Water Quality Control Plan, San Diego Basin, Region 9, (Basin Plan), state in part *"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge…"* Urban runoff discharges from MS4s are considered toxic when (1) the toxic effect observed in an acute toxicity test exceeds zero Toxic Units Acute (TUa=0); or (2) the toxic effect observed in a chronic toxicity test exceeds one Toxic Unit Chronic (TUc=1).

27. **FOCUS ON MAN-MADE POLLUTANTS AND FLOWS:** The focus of this Order is on the control of urban runoff pollutants and flows which are either generated or accelerated by human activities. This Order is not meant to control background or naturally occurring pollutants and flows.

28. **COMMON WATERSHEDS AND CWA SECTION 303(d) IMPAIRED WATERS**: The Copermittees discharge urban runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within ten of the eleven hydrologic units (watersheds) comprising the San Diego Region as shown in Table 2 below. During its downstream course, urban runoff is conveyed through lined and unlined (natural, manmade, and partially modified) channels, all of which are defined as components of the Copermittees' MS4.

    Some of the receiving water bodies, which receive or convey urban runoff discharges, have been designated as impaired by the SDRWQCB and USEPA in 1998 pursuant to Clean Water Act section 303(d). Also shown below are the watershed management areas (WMAs) as defined in the SDRWQCB report, Watershed Management Approach, January 2000.

Table 2. Watershed Management Areas (WMAs)

SDRWQCB WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT	COPERMITTEES
Santa Margarita River	Santa Margarita (902.00)	Santa Margarita River and Estuary, Pacific Ocean	1. Coliform Bacteria 2. Nutrients	1. County of San Diego
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River and Estuary, Pacific Ocean	1. Coliform Bacteria 2. Nutrients	1. City of Escondido 2. City of Oceanside 3. City of Vista 4. County of San Diego
Carlsbad	Carlsbad (904.00)	Batiquitos Lagoon San Elijo Lagoon Agua Hedionda Lagoon Buena Vista Lagoon And Tributary Streams Pacific Ocean	1. Coliform Bacteria 2. Nutrients 3. Sediment	1. City of Carlsbad 2. City of Encinitas 3. City of Escondido 4. City of Oceanside 5. City of San Marcos 6. City of Solana Beach 7. City of Vista 8. County of San Diego
San Dieguito River	San Dieguito (905.00)	San Dieguito River and Estuary, Pacific Ocean	1. Coliform Bacteria	1. City of Del Mar 2. City of Escondido 3. City of Poway 4. City of San Diego 5. City of Solana Beach

SDRWQCB WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT	COPERMITTEES
				6. County of San Diego
Mission Bay	Peñasquitos (906.00)	Los Peñasquitos Lagoon Mission Bay, Pacific Ocean	1. Coliform Bacteria 2. Metals 3. Nutrients 4. Sediment	1. City of Del Mar 2. City of Poway 3. City of San Diego 4. County of San Diego
San Diego River	San Diego (907.00)	San Diego River, Pacific Ocean	1. Coliform Bacteria	1. City of El Cajon 2. City of La Mesa 3. City of Poway 4. City of San Diego 5. City of Santee 6. County of San Diego
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay Sweetwater River Otay River Pacific Ocean	1. Coliform Bacteria 2. Metals 3. Toxicity 4. Benthic Community Degradation	1. City of Chula Vista 2. City of Coronado 3. City of Imperial Beach 4. City of La Mesa 5. City of Lemon Grove 6. City of National City 7. City of San Diego 8. County of San Diego 9. San Diego Unified Port District
Tijuana River	Tijuana (911.00)	Tijuana River and Estuary Pacific Ocean	1. Coliform Bacteria 2. Low Dissolved Oxygen 3. Metals 4. Nutrients 5. Pesticides 6. Synthetic Organics 7. Total Dissolved Solids 8. Trash	1. City of Imperial Beach 2. City of San Diego 3. County of San Diego

29. **CUMULATIVE POLLUTANT LOAD CONTRIBUTIONS:** Because they are interconnected, each MS4 within a watershed contributes to the cumulative pollutant loading, volume, and velocity of urban runoff and the ensuing degradation of downstream receiving water bodies. Accordingly, inland MS4s contribute to coastal impairments.

30. **LAND USE PLANNING ON A WATERSHED SCALE**: Because urban runoff does not recognize political boundaries, "watershed-based" land use planning (pursued collaboratively by neighboring local governments) can greatly enhance the protection of shared natural water resources. Such planning enables multiple jurisdictions to work together to plan for both development and resource conservation that can be environmentally as well as economically sustainable.

31. **INTERGOVERNMENTAL COORDINATION:** Within their common watersheds it is essential for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially Caltrans, the Department of Defense, and Native American Tribes, is also critical.

    Establishment of a management structure, within which the Copermittees subject to this Order, will fund and coordinate those aspects of their joint obligations will promote implementation of Urban Runoff Management Programs on a watershed and regional basis in the most cost effective manner.

32. **WASTE REMOVAL:** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the United States unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. Once removed, such accumulated wastes must be characterized and lawfully disposed.

33. **TOXIC HOT SPOTS**: Urban runoff is a significant contributor to the creation and persistence of Toxic Hot Spots in San Diego Bay. California Water Code section 13395 requires regional boards to reevaluate waste discharge requirements (WDRs) associated with toxic hot spots. The State Water Resources Control Board (SWRCB) adopted the Consolidated Toxic Hot Spot Cleanup Plan in June 1999. The Plan states: "The reevaluation [of WDRs associated with toxic hot spots] shall consist of (1) an assessment of the WDRs that may influence the creation or further pollution of the known toxic hot spot, (2) an assessment of which WDRs need to be modified to improve environmental conditions at the known toxic hot spot, and (3) a schedule for completion of any WDR modifications deemed appropriate."

34. **CHANGING THE STORM WATER MANAGEMENT APPROACH**: In contrast to the conventional "conveyance" approach, a more natural approach to storm water management seeks to filter and infiltrate runoff by allowing it to flow slowly over permeable vegetated surfaces. By "preserving and restoring the natural hydrologic cycle", filtration and infiltration can greatly reduce the volume/peak rate, velocity, and pollutant loads of urban runoff. The greatest opportunities for changing from a "conveyance" to a more natural management approach occur during the land use planning and zoning processes and when new development projects are under early design.

35. **INFILTRATION AND POTENTIAL GROUNDWATER CONTAMINATION:** Any drainage feature that infiltrates runoff poses some risk of potential groundwater contamination. Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; and (3) ensuring that each drainage feature is adequately maintained in perpetuity. Minimum conditions needed to protect groundwater are specified in section F.1.b. of this Order.

36. **VECTOR CONTROL:** Certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents) if not properly designed or maintained. Close collaboration and cooperative effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of the Urban Runoff Management Programs is necessary to minimize nuisances and public health impacts resulting from vector breeding.

37. **LEGAL AUTHORITY:** This Order is based on the federal Clean Water Act, the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable state and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board, the Regional Water Quality Control Plan (Basin Plan) adopted by the Regional Board, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

38. **TOTAL MAXIMUM DAILY LOADS (TMDLs):** 40 CFR 122.44 (d)(vii)(B) requires that NPDES permits contain effluent limitations that are consistent with waste load allocations developed under a TMDL. Several TMDLs are being developed in the San Diego Region for impaired waterbodies that receive Copermittees' discharge. Once these TMDLs are approved by the SDRWQCB and USEPA, Copermittees' discharge of urban runoff into an impaired waterbody will be subject to load allocations established by the TMDLs.

39. **ANTIDEGRADATION:** Conscientious implementation of URMPs that satisfy the requirements contained in this Order will reduce the likelihood that discharges from MS4s will cause or contribute to unreasonable degradation of the quality of receiving waters. Therefore, this Order is in conformance with SWRCB Resolution No. 68-16 and the federal antidegradation policy described in 40 CFR 131.12.

40. **CEQA:** The issuance of waste discharge requirements for the discharge of urban runoff from MS4s to waters of the United States is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, § 21000 et seq.) in accordance with the CWC § 13389.

41. **PUBLIC NOTICE:** The SDRWQCB has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of urban runoff.

42. **PUBLIC HEARING**: The SDRWQCB has, at a public meeting on December 13, 2000, held a public hearing and heard and considered all comments pertaining to the terms and conditions of this Order.

IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations adopted thereunder, shall each comply with the following:

A. PROHIBITIONS -- DISCHARGES

1. Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC § 13050), in waters of the state are prohibited.

2. Discharges from MS4s which cause or contribute to exceedances of receiving water quality objectives for surface water or groundwater are prohibited.

3. Discharges from MS4s containing pollutants which have not been reduced to the maximum extent practicable (MEP) are prohibited.

4. Applicable to New Development and Redevelopment:
Post-development runoff containing pollutants loads which cause or contribute to an exceedance of receiving water quality objectives or which have not been reduced to the maximum extent practicable is prohibited.

5. In addition to the above prohibitions, discharges from MS4s are subject to all Basin Plan prohibitions cited in **Attachment A** to this Order.

B. PROHIBITIONS -- NON-STORM WATER DISCHARGES

1. Each Copermittee shall effectively prohibit **all** types of non-storm water discharges into its Municipal Separate Storm Sewer System (MS4) unless such discharges are either authorized by a separate NPDES permit; or not prohibited in accordance with B.2. and B.3. below.

2. Pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1), the following categories of non-storm water discharges need only be prohibited from entering an MS4 if such categories of discharges are identified by the Copermittee as a significant source of pollutants to waters of the United States:

   a. Diverted stream flows;
   b. Rising ground waters;
   c. Uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to MS4s;
   d. Uncontaminated pumped ground water;
   e. Foundation drains;
   f. Springs;
   g. Water from crawl space pumps;
   h. Footing drains;
   i. Air conditioning condensation;
   j. Flows from riparian habitats and wetlands;

k. Water line flushing;
l. Landscape irrigation;
m. Discharges from potable water sources other than water main breaks;
n. Irrigation water;
o. Lawn watering;
p. Individual residential car washing; and
q. Dechlorinated swimming pool discharges.

3. When a discharge category above is identified as a significant source of pollutants to waters of the United States, the Copermittee shall either:

   a. Prohibit the discharge category from entering its MS4; ***OR***

   b. Not prohibit the discharge category and implement, or require the responsible party(ies) to implement, BMPs which will reduce pollutants to the MEP; ***AND***

   c. For each discharge category not prohibited, the Copermittee shall submit the following information to the SDRWQCB within **365 days** of adoption of this Order:

      (1) The non-storm water discharge category listed above which the Copermittee elects not to prohibit; and

      (2) The BMP(s) for each discharge category listed above which the Copermittee will implement, or require the responsible party(ies) to implement, to prevent or reduce pollutants to the MEP.

4. **Fire Fighting Flows:** Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited. As part of the Jurisdictional URMP, each Copermittee shall develop and implement a program within 365 days of adoption of this Order to reduce pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) identified by the Copermittee to be significant sources of pollutants to waters of the United States.

5. **Dry Weather Analytical Monitoring and Non-Storm Water Discharges:** Each Copermittee shall examine all dry weather analytical monitoring results collected in accordance with section F.5. and Attachment E of this Order to identify water quality problems which may be the result of any non-prohibited discharge category(ies) identified above in Non-Storm Water Discharges to MS4s Prohibition B.2. Follow-up investigations shall be conducted as necessary to identify and control any non-prohibited discharge category(ies) listed above.

C. RECEIVING WATER LIMITATIONS

1. Discharges 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.

2. Each Copermittee shall comply with Part C.1, Part A.2, and Part A.5 as it applies to Prohibition 5 in Attachment A of this Order through timely implementation of control measures and other actions to reduce pollutants in urban runoff discharges in accordance with the Jurisdictional Urban Runoff Management Program (Jurisdictional URMP) and other requirements of this Order including any modifications. The Jurisdictional URMP shall be designed to achieve compliance with Part C.1, Part A.2, and Part A.5 as it applies to Prohibition 5 in Attachment A of this Order. If exceedance(s) of water quality standards persist notwithstanding implementation of the URMP and other requirements of this Order, the Copermittee shall assure compliance with Part C.1, Part A.2, and Part A.5 as it applies to Prohibition 5 in Attachment A of this Order by complying with the following procedure:

a. Upon a determination by either the Copermittee or the SDRWQCB that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the SDRWQCB that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional URMP unless the SDRWQCB directs an earlier submittal. The report shall include an implementation schedule. The SDRWQCB may require modifications to the report;

b. Submit any modifications to the report required by the SDRWQCB within 30 days of notification;

c. Within 30 days following approval of the report described above by the SDRWQCB, the Copermittee shall revise its Jurisdictional URMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required;

d. Implement the revised Jurisdictional URMP and monitoring program in accordance with the approved schedule.

So long as the Copermittee has complied with the procedures set forth above and are implementing the revised Jurisdictional URMP, the Copermittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the SDRWQCB to do so.

3. Nothing in this section shall prevent the SDRWQCB from enforcing any provision of this Order while the Copermittee prepares and implements the above report.

D. LEGAL AUTHORITY

1. Each Copermittee shall establish, maintain, and enforce adequate legal authority to control pollutant discharges **into** and **from** its MS4 through ordinance, statute, permit, contract or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

   a. Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity **to** its MS4 and control the quality of runoff **from** industrial and construction sites. This requirement applies both to industrial and construction sites which have coverage under the statewide general industrial or construction storm water permits, as well as to those sites which do not. Grading ordinances shall be upgraded and enforced as necessary to comply with this Order.

   b. Prohibit **all** identified illicit discharges not otherwise allowed pursuant to section B.2 including but not limited to:

      (1) Sewage;

      (2) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;

      (3) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;

      (4) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc.;

(5) Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, commercial, and residential areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;

(6) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;

(7) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;

(8) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and

(9) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

c. Prohibit and eliminate illicit connections to the MS4;

d. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;

e. Require compliance with conditions in Copermittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);

f. Utilize enforcement mechanisms to require compliance with Copermittee storm water ordinances, permits, contracts, or orders;

g. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as Caltrans, the Department of Defense, or Native American Tribes is encouraged.;

h. Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits and with this Order, including the prohibition on illicit discharges to the MS4. This means the Copermittee must have authority to enter, sample, inspect, review and copy records, and require regular reports from industrial facilities discharging into its MS4, including construction sites; and

i. Require the use of best management practices (BMPs) to prevent or reduce the discharge of pollutants to MS4s.

2. Within **180 days** of adoption of this Order, each Copermittee shall provide to the SDRWQCB a statement certified by its chief legal counsel that the Copermittee has adequate legal authority to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order. This statement shall include:

a. Identification of all departments within the jurisdiction that conduct urban runoff related activities, and their roles and responsibilities under this Order. Include an up to date organizational chart specifying these departments and key personnel.

b. Citation of urban runoff related ordinances and the reasons they are enforceable;

c. Identification of the local administrative and legal procedures available to mandate compliance with urban runoff related ordinances and therefore with the conditions of this

Order;

d. Description of how these ordinances are implemented and appealed; and

e. Description of whether the municipality can issue administrative orders and injunctions or if it must go through the court system for enforcement actions.

E. TECHNOLOGY BASED STANDARDS

Each Copermittee shall implement, or require implementation of, best management practices to ensure that the following pollutant discharges **into** and **from** its MS4 are reduced to the applicable technology based standard as specified below:

Table 3. Technology Based Standards[2]

POLLUTANT DISCHARGE FROM	DESCRIPTION	APPLICABLE PERFORMANCE STANDARD
Industrial Activity owned by the Copermittee	Categorical Industry in 40 CFR 122.26	BAT/BCT (pursuant to Statewide General Industrial Permit)
Industrial Activity	All other industry	MEP
Construction Activity owned by the Copermittee	Greater than or Equal to 5 Acres (or less than 5 acres and Part of a Larger Common Plan of Sale or Development)	BAT/BCT (pursuant to Statewide General Construction Permit)
Construction Activity	All Other construction	MEP
Other Sources	All Other Land Use Activities	MEP
MS4s	All discharges from MS4s	MEP

F. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM`

Each Copermittee shall take appropriate actions to reduce discharges of pollutants and runoff flow during each of the three major phases of urban development, i.e., the planning, construction, and existing development (or use) phases.

Each Copermittee shall implement a Jurisdictional Urban Runoff Management Program (Jurisdictional URMP) that contains the components shown below as described in Sections F.1. through F.8:

F.1. Land-Use Planning for New Development and Redevelopment Component
F.2. Construction Component
F.3. Existing Development Component
- **a. Municipal**
- **b. Industrial**
- **c. Commercial**
- **d. Residential**

F.4. Education Component
F.5. Illicit Discharge Detection and Elimination Component
F.6. Public Participation Component
F.7. Assessment of Jurisdictional URMP Effectiveness Component
F.8. Fiscal Analysis Component

[2]. Pursuant to this Order, each Copermittee shall ensure that pollutants in runoff from industrial and construction sites within its jurisdiction have been reduced to the MEP standard before entering its MS4. The industrial and construction site dischargers themselves however must ensure that pollutants in runoff leaving their sites have been reduced to the BAT/BCT standard pursuant to either the statewide General Industrial or Construction Storm Water Permit. Runoff from industrial and construction sites owned by municipalities and subject to either the General Industrial or Construction Storm Water Permits, must meet the BAT/BCT standard.

F.1. Land-Use Planning for New Development and Redevelopment Component

Each Copermittee shall minimize the short and long-term impacts on receiving water quality from new development and redevelopment. In order to reduce pollutants and runoff flows from new development and redevelopment to the maximum extent practicable, each Copermittee shall at a minimum:

F.1.a Assess General Plan
F.1.b Modify Development Project Approval Processes
F.1.c Revise Environmental Review Processes
F.1.d Conduct Education Efforts Focused on New Development and Redevelopment

F.1.a. Assess General Plan

Each Copermittee's General Plan or equivalent plan (e.g., Comprehensive, Master, or Community Plan) shall include water quality and watershed protection principles and policies to direct land-use decisions and require implementation of consistent water quality protection measures for development projects. As part of its Jurisdictional Urban Runoff Management Program document, each Copermittee shall provide a workplan with time schedule detailing any changes to its General Plan regarding water quality and watershed protection. Examples of water quality and watershed protection principles and policies to be considered include the following:

(1) Minimize the amount of impervious surfaces and directly connected impervious surfaces in areas of new development and redevelopment and where feasible slow runoff and maximize on-site infiltration of runoff.

(2) Implement pollution prevention methods supplemented by pollutant source controls and treatment. Use small collection strategies located at, or as close as possible to, the source (i.e., the point where water initially meets the ground) to minimize the transport of urban runoff and pollutants offsite and into an MS4.

(3) Preserve, and where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones. Encourage land acquisition of such areas.

(4) Limit disturbances of natural water bodies and natural drainage systems caused by development including roads, highways, and bridges.

(5) Prior to making land use decisions, utilize methods available to estimate increases in pollutant loads and flows resulting from projected future development. Require incorporation of structural and non-structural BMPs to mitigate the projected increases in pollutant loads and flows.

(6) Avoid development of areas that are particularly susceptible to erosion and sediment loss; or establish development guidance that identifies these areas and protects them from erosion and sediment loss.

(7) Reduce pollutants associated with vehicles and increasing traffic resulting from development. Coordinate local traffic management reduction efforts with the San Diego County Congestion Management Plan.

(8) Implement the San Diego Association of Government's (SANDAG's) recommendations as found in the Water Quality Element of its Regional Growth Management Strategy.

(9) Post-development runoff from a site shall not contain pollutant loads which cause or contribute to an exceedance of receiving water quality objectives or which have not been reduced to the maximum extent practicable.

F.1.b. Modify Development Project Approval Processes

Prior to project approval and issuance of local permits, Copermittees shall require each proposed project to implement measures to ensure that pollutants and runoff from the development will be reduced to the maximum extent practicable and will not cause or contribute to an exceedance of receiving water quality objectives. Each Copermittee shall further ensure that all development will be in compliance with Copermittee storm water ordinances, local permits, all other applicable ordinances and requirements, and this Order.

(1) Development Project Requirements

Each Copermittee shall include development project requirements in local permits to ensure that pollutant discharges and runoff flows from development are reduced to the maximum extent practicable and that receiving water quality objectives are not violated throughout the life of the project. Such requirements shall, at a minimum:

(a) Require project proponent to implement source control BMPs for all applicable development projects.
(b) Require 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.
(c) Require project proponent to implement buffer zones for natural water bodies, where feasible. Where buffer zone implementation is infeasible, require project proponent to implement other buffers such as trees, lighting restrictions, access restrictions, etc.
(d) Require industrial applicants subject to California's statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction), (hereinafter General Industrial Permit), to provide evidence of coverage under the General Industrial Permit.
(e) Require project proponent to ensure its grading or other construction activities meet the provisions specified in Section F.2. of this Order.
(f) Require project proponent to provide proof of a mechanism which will ensure ongoing long-term maintenance of all structural post-construction BMPs.

(2) Standard Urban Storm Water Mitigation Plans (SUSMPs)

Within 365 days of adoption of this Order, the Copermittees shall collectively develop a model Standard Urban Storm Water Mitigation Plan (SUSMP) to reduce pollutants and runoff flows from all new development and significant redevelopment projects falling under the priority project categories or locations listed in section F.1.b.(2)(a) below. Within 180 days of approval of the model SUSMP in the public process by the SDRWQCB, each Copermittee shall adopt its own local SUSMP, and amended ordinances consistent with the approved model SUSMP, and shall submit both (local SUSMP and amended ordinances) to the SDRWQCB.

Immediately following adoption of its local SUSMP, each Copermittee shall ensure that all new development and significant redevelopment projects falling under the priority project categories or locations listed in F.1.b.(2)(a) below meet SUSMP requirements. The SUSMP requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities. If a Copermittee determines that lawful prior approval of a project exists, whereby application of SUSMP requirements to the project is infeasible, SUSMP requirements need not apply to the project. Where feasible, the Copermittees shall utilize the 18 month SUSMP implementation period to ensure that

projects undergoing approval processes include application of SUSMP requirements in their plans.

(a) *Priority Development Project Categories - SUSMP requirements shall apply to all new development and significant redevelopment projects falling under the priority project categories or locations listed below.* Significant redevelopment is defined as the creation or addition of at least 5,000 square feet of impervious surfaces on an already developed site. Significant redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces. Where significant redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria discussed in section F.1.b.(2)(c) applies only to the addition, and not to the entire development.

i. *Home subdivisions of 100 housing units or more*. This category includes single-family homes, multi-family homes, condominiums, and apartments.

ii. *Home subdivisions of 10-99 housing units*. This category includes single-family homes, multi-family homes, condominiums, and apartments.

iii. *Commercial developments greater than 100,000 square feet*. This category is defined as any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than 100,000 square feet. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; commercial airfields; and other light industrial facilities.

iv. *Automotive repair shops.* This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

v. *Restaurants*. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet.

vi. *All hillside development greater than 5,000 square feet.* This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

vii. *Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition.* Environmentally sensitive areas include but are not limited to all Clean Water Act Section 303(d) impaired water bodies;

areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. "Directly adjacent" means situated within 200 feet of the environmentally sensitive area. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.

viii. *Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff*. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

ix. *Street, roads, highways, and freeways.* This category includes any paved surface which is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(b) BMP Requirements – The SUSMP shall include a list of recommended source control and structural treatment BMPs. The SUSMP shall require all new development and significant redevelopment projects falling under the above priority project categories or locations to implement a combination of BMPs selected from the recommended BMP list, including at a minimum (1) source control BMPs and (2) structural treatment BMPs. The BMPs shall, at a minimum:

i. Control the post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion, and to protect stream habitat;
ii. Conserve natural areas where feasible;
iii. Minimize storm water pollutants of concern in urban runoff from the new development or significant redevelopment (through implementation of source control BMPs). Identification of pollutants of concern should include at a minimum consideration of any pollutants for which water bodies receiving the development's runoff are listed as impaired under Clean Water Act section 303(d), any pollutant associated with the land use type of the development, and any pollutant commonly associated with urban runoff;
iv. Remove pollutants of concern from urban runoff (through implementation of structural treatment BMPs);
v. Minimize directly connected impervious areas where feasible;
vi. Protect slopes and channels from eroding;
vii. Include storm drain stenciling and signage;
viii. Include properly designed outdoor material storage areas;
ix. Include properly designed trash storage areas;
x. Include proof of a mechanism, to be provided by the project proponent or Copermittee, which will ensure ongoing long-term structural BMP maintenance;
xi. Include additional water quality provisions applicable to individual priority project categories;
xii. Be correctly designed so as to remove pollutants to the maximum extent practicable;
xiii. Be implemented close to pollutant sources, when feasible, and prior to discharging into receiving waters supporting beneficial uses; and

xiv. Ensure that post-development runoff does not contain pollutant loads which cause or contribute to an exceedance of water quality objectives or which have not been reduced to the maximum extent practicable.

(c) Numeric Sizing Criteria – The SUSMP shall require structural treatment BMPs to be implemented for all priority development projects. All structural treatment BMPs shall be located so as to infiltrate, filter, or treat the required runoff volume or flow prior to its discharge to any receiving waterbody supporting beneficial uses. Structural treatment BMPs may be shared by multiple new development projects as long as construction of any shared structural treatment BMPs is completed prior to the use of any new development project from which the structural treatment BMP will receive runoff.

In addition to meeting the BMP requirements listed in item F.1.b.(2)(b) above, all structural treatment BMPs for a single priority development project shall collectively be sized to comply with the following numeric sizing criteria:

Volume

Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

i. The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record (0.6 inch approximate average for the San Diego County area);[3] or

ii. The volume of runoff produced by the 85th percentile 24-hour rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

iii. The volume of annual runoff based on unit basin storage volume, to achieve 90% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial, (1993); or

iv. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event;[4]

OR

Flow

Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

[3] This volume is not a single volume to be applied to all of San Diego County. The size of the 85th percentile storm event is different for various parts of the County. The Copermittees are encouraged to calculate the 85th percentile storm event for each of their jurisdictions using local rain data pertinent to their particular jurisdiction (the 0.6 inch standard is a rough average for the County and should only be used where appropriate rain data is not available). In addition, isopluvial maps contained in the County of San Diego Hydrology Manual may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees shall describe their method for using isopluvial maps in the model and local SUSMPs.

[4] Under this volume criteria, hourly rainfall data may be used to calculate the 85th percentile storm event, where each storm event is identified by its separation from other storm events by at least six hours of no rain. Where the Copermittees may use hourly rainfall data to calculate the 85th percentile storm event, the Copermittees shall describe their method for using hourly rainfall data to calculate the 85th percentile storm event in the model and local SUSMPs.

i. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or
ii. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or
iii. The maximum flow rate of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

(d) Equivalent Numeric Sizing Criteria - The Copermittees may develop, as part of the model SUSMP, any equivalent method for calculating the volume or flow which must be mitigated (i.e., any equivalent method for calculating numeric sizing criteria) by post-construction structural treatment BMPs. Such equivalent sizing criteria may be authorized by the SDRWQCB for use in place of the above criteria. In the absence of development and subsequent authorization of such equivalent numeric sizing criteria, the above numeric sizing criteria requirement shall be implemented.

(e) Pollutants or Conditions of Concern – As part of the model SUSMP, the Copermittees shall develop a procedure for pollutants or conditions of concern to be identified for each new development or significant redevelopment project. The procedure shall include, at a minimum, consideration of (1) receiving water quality (including pollutants for which receiving waters are listed as impaired under Clean Water Act section 303(d)); (2) land use type of the development project and pollutants associated with that land use type; (3) pollutants expected to be present on site; (4) changes in storm water discharge flow rates, velocities, durations, and volumes resulting from the development project; and (5) sensitivity of receiving waters to changes in storm water discharge flow rates, velocities, durations, and volumes.

(f) Implementation Process – As part of the model SUSMP, the Copermittees shall develop a process by which SUSMP requirements will be implemented. The process shall identify at what point in the planning process development projects will be required to meet SUSMP requirements. The process shall also include identification of the roles and responsibilities of various municipal departments in implementing the SUSMP requirements, as well as any other measures necessary for the implementation of SUSMP requirements.

(g) Restaurants Less than 5,000 Square Feet - New development and significant redevelopment restaurant projects where the land area development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirement F.1.b.(2)(c) and peak flow rate requirement F.1.b(2)(b)(i). A restaurant is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC Code 5812).

(h) Waiver Provision – A Copermittee may provide for a project to be waived from the requirement of implementing structural treatment BMPs (F.1.b.(2)(c)) if infeasibility can be established. A waiver of infeasibility shall only be granted by a Copermittee when all available structural treatment BMPs have been considered and rejected as infeasible. Copermittees shall notify the SDRWQCB within 5 days of each waiver issued and shall include the name of the person granting each waiver.

As part of the model SUSMP, the Copermittees may develop a program to require project proponents who have received waivers to transfer the savings in cost, as determined by the Copermittee(s), to a storm water mitigation fund. This program may be implemented by all Copermittees which choose to provide waivers. Funds may be

used on projects to improve urban runoff quality within the watershed of the waived project. The waiver program may identify:

i. The entity or entities that will manage the storm water mitigation fund (i.e., assume full responsibility for)
ii. The range and types of acceptable projects for which mitigation funds may be expended;
iii. The entity or entities that will assume full responsibility for each mitigation project including its successful completion
iv. How the dollar amount of fund contributions will be determined.

(i) Infiltration and Groundwater Protection – To protect groundwater quality, each Copermittee shall apply restrictions to the use of structural treatment BMPs which are designed to primarily function as infiltration devices (such as infiltration trenches and infiltration basins). Such restrictions shall ensure that the use of such infiltration structural treatment BMPs shall not cause or contribute to an exceedance of groundwater quality objectives. At a minimum, use of structural treatment BMPs which are designed to primarily function as infiltration devices shall meet the following conditions:[5]

i. Urban runoff shall undergo pretreatment such as sedimentation or filtration prior to infiltration.
ii. All dry weather flows shall be diverted from infiltration devices.
iii. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural treatment BMPs are to be used.
iv. Infiltration structural treatment BMPs shall be adequately maintained so that they remove pollutants to the maximum extent practicable.
v. The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained.
vi. The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.
vii. Infiltration structural treatment BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as designated by each Copermittee.
viii. Infiltration structural BMPs shall be located a minimum of 100 feet horizontally from any water supply wells.

As part of the model and local SUSMPs, the Copermittees may develop alternative restrictions on the use of structural treatment BMPs which are designed to primarily function as infiltration devices.

(j) Downstream Erosion – As part of the model SUSMP and the local SUSMPs, the Copermittees shall develop criteria to ensure that discharges from new development and significant redevelopment maintain or reduce pre-development downstream erosion

[5] These conditions do not apply to structural treatment BMPs which allow incidental infiltration and are not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.)

and protect stream habitat. At a minimum, criteria shall be developed to control peak storm water discharge rates and velocities in order to maintain or reduce pre-development downstream erosion and protect stream habitat. Storm water discharge volumes and durations should also be considered.

F.1.c. Revise Environmental Review Processes

(1) To the extent feasible, the Copermittees shall revise their current environmental review processes to include requirements for evaluation of water quality effects and identification of appropriate mitigation measures. The following questions are examples to be considered in addressing increased pollutants and flows from proposed projects:

(a) Could the proposed project result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical storm water pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash).
(b) Could the proposed project result in significant alteration of receiving water quality during or following construction?
(c) Could the proposed project result in increased impervious surfaces and associated increased runoff?
(d) Could the proposed project create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes?
(e) Could the proposed project result in increased erosion downstream?
(f) Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list. If so, can it result in an increase in any pollutant for which the water body is already impaired?
(g) Is project tributary to other environmentally sensitive areas? If so, can it exacerbate already existing sensitive conditions?
(h) Could the proposed project have a potentially significant environmental impact on surface water quality, to either marine, fresh, or wetland waters?
(i) Could the proposed project have a potentially significant adverse impact on ground water quality?
(j) Could the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?
(k) Can the project impact aquatic, wetland, or riparian habitat?

F.1.d. Conduct Education Efforts Focused on New Development and Redevelopment

(1) Internal: Municipal Staff and Others

Each Copermittee shall implement an education program to ensure that its planning and development review staffs (and Planning Boards and Elected Officials, if applicable) have an understanding of:

(a) Federal, state, and local water quality laws and regulations applicable to development projects;
(b) The connection between land use decisions and short and long-term water quality impacts (i.e., impacts from land development and urbanization); and
(c) How impacts to receiving water quality resulting from development can be minimized (i.e., through implementation of various source control and structural BMPs).

(2) External: Project Applicants, Developers, Contractors, Property Owners, Community Planning Groups

As early in the planning and development process as possible, each Copermittee shall implement a program to educate project applicants, developers, contractors, property owners, and community planning groups on the following topics:

(a) Federal, state, and local water quality laws and regulations applicable to development projects;
(b) Required federal, state, and local permits pertaining to water quality;
(c) Water quality impacts of urbanization; and
(d) Methods for minimizing the impacts of development on receiving water quality.

F.2. Construction Component

Each Copermittee shall implement a Construction Component of its Jurisdictional URMP to reduce pollutants in runoff from construction sites during all construction phases. At a minimum the construction component shall address:

F.2.a. Pollution Prevention
F.2.b. Grading Ordinance Update
F.2.c. Modify Construction and Grading Approval Process
F.2.d. Source Identification
F.2.e. Threat to Water Quality Prioritization
F.2.f. BMP Implementation
F.2.g. Inspection of Construction Sites
F.2.h. Enforcement of Construction Sites
F.2.i. Reporting of Non-compliant Sites
F.2.j. Education Focused on Construction Activities

F.2.a. Pollution Prevention (Construction)

Each Copermittee shall implement pollution prevention methods in its Construction Component and shall require its use by construction site owners, developers, contractors, and other responsible parties, where appropriate.

F.2.b. Grading Ordinance Update (Construction)

Each Copermittee shall review and update its grading ordinances as necessary for compliance with its storm water ordinances and this Order. The updated grading ordinance shall require implementation of BMPs and other measures during all construction activities, including the following BMPs and other measures or their equivalent:

(1) Erosion prevention;
(2) Seasonal restrictions on grading;
(3) Slope stabilization requirements;
(4) Phased grading;
(5) Revegetation as early as feasible;
(6) Preservation of natural hydrologic features;
(7) Preservation of riparian buffers and corridors;
(8) Maintenance of all source control and structural treatment BMPs; and
(9) Retention and proper management of sediment and other construction pollutants on site.

F.2.c Modify Construction and Grading Approval Process (Construction)

Prior to approval and issuance of local construction and grading permits, each Copermittee shall require all individual proposed construction and grading projects to implement measures to ensure that pollutants from the site will be reduced to the maximum extent practicable and will not cause or contribute to an exceedance of water quality objectives. Each Copermittee shall further ensure that

all grading and construction activities will be in compliance with applicable Copermittee ordinances (e.g., storm water, grading, construction, etc.) and other applicable requirements, including this Order.

(1) Construction and Grading Project Requirements

Include construction and grading project requirements in local grading and construction permits to ensure that pollutant discharges are reduced to the maximum extent practicable and water quality objectives are not violated during the construction phase. Such requirements shall include the following requirements or their equivalent:

(a) Require project proponent to develop and implement a plan to manage storm water and non-storm water discharges from the site at all times;
(b) Require project proponent to minimize grading during the wet season and coincide grading with seasonal dry weather periods to the extent feasible. If grading does occur during the wet season, require project proponent to implement additional BMPs for any rain events which may occur, as necessary for compliance with this Order;
(c) Require project proponent to emphasize erosion prevention as the most important measure for keeping sediment on site during construction;
(d) Require project proponent to utilize sediment controls as a supplement to erosion prevention for keeping sediment on-site during construction, and never as the single or primary method;
(e) Require project proponent to minimize areas that are cleared and graded to only the portion of the site that is necessary for construction;
(f) Require project proponent to minimize exposure time of disturbed soil areas;
(g) Require project proponent to temporarily stabilize and reseed disturbed soil areas as rapidly as possible;
(h) (h) Require project proponent to permanently revegetate or landscape as early as feasible;
(i) Require project proponent to stabilize all slopes; and
(j) Require project proponents subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities, (hereinafter General Construction Permit), to provide evidence of existing coverage under the General Construction Permit.

F.2.d. Source Identification (Construction)

Each Copermittee shall annually develop and update, prior to the rainy season, a watershed based inventory of all construction sites within its jurisdiction regardless of site size or ownership. This requirement is applicable to all construction sites regardless of whether the construction site is subject to the California statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities (hereinafter General Construction Permit), or other individual NPDES permit. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

F.2.e. Threat to Water Quality Prioritization (Construction)

(1) To establish priorities for construction oversight activities under this Order, the Copermittee shall prioritize its watershed-based inventory (developed pursuant to F.2.d. above) by threat to water quality. Each construction site shall be classified as high, medium, or low threat to water quality. In evaluating threat to water quality each Copermittee shall consider (1) soil erosion potential; (2) site slope; (3) project size and type; (4) sensitivity of receiving water bodies; (5) proximity to receiving water bodies; (6) non-storm water discharges; and (7) any other relevant factors.

(2) A high priority construction site shall at a minimum be defined as a site meeting either of the following criteria or equivalent criteria:

(a) The site is 50 acres or more and grading will occur during the wet season; OR
(b) The site is (1) 5 acres or more and (2) tributary to a Clean Water Act section 303(d) water body impaired for sediment or is within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area (as defined in section F.1.b.(2)(a)vii of this Order).

F.2.f. BMP Implementation (Construction)

(1) Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality construction sites (as determined under section F.2.e). BMPs are to be implemented year round.

(2) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the site's threat to water quality rating) at each construction site within its jurisdiction year round. If particular minimum BMPs are infeasible at any specific site, each Copermittee shall implement, or require the implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order, including BMPs which are more stringent than those required under the statewide General Construction Permit.

(3) Each Copermittee shall implement, or require the implementation of, BMPs year round; however, BMP implementation requirements can vary based on wet and dry seasons.

(4) Each Copermittee shall implement, or require implementation of, additional controls for construction sites tributary to Clean Water Act section 303(d) water bodies impaired for sediment as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for construction sites within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.2.g. Inspection of Construction Sites (Construction)

(1) Each Copermittee shall conduct construction site inspections for compliance with its ordinances (grading, storm water, etc.), permits (construction, grading, etc.), and this Order. Inspections shall include review of site erosion control and BMP implementation plans.

(2) Each Copermittee shall establish inspection frequencies and priorities as determined by the threat to water quality prioritization described in F.2.e above. During the wet season (i.e., October 1 through April 30 of each year), each Copermittee shall inspect, at a minimum, each High Priority construction site, either:

(a) Weekly
OR
(b) Monthly for any site that the responsible Copermittee certifies in a written statement to the SDRWQCB all of the following (certified statements may be submitted to the SDRWQCB at any time for one or more sites):

i. Copermittee has record of construction site's Waste Discharge Identification Number (WDID#) documenting construction site's coverage under the statewide General Construction Permit; and
ii. Copermittee has reviewed the constructions site's Storm Water Pollution Prevention Plan (SWPPP); and

iii. Copermittee finds SWPPP to be in compliance with all local ordinances, permits, and plans; and
iv. Copermittee finds that the SWPPP is being properly implemented on site.

At a minimum, Medium and Low Priority construction sites shall be inspected by Copermittees twice during the wet season. All construction sites shall be inspected by the Copermittees as needed during the dry season (i.e., May 1 through September 30 of each year).

(3) Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

F.2.h. Enforcement of Construction Sites (Construction)

Each Copermittee shall enforce its ordinances (grading, storm water, etc.) and permits (construction, grading, etc.) at all construction sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include sanctions to ensure compliance. Sanctions shall include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

F.2.i. Reporting of Non-compliant Sites (Construction)

Each Copermittee shall provide oral notification to the SDRWQCB of non-compliant sites that are determined to pose a threat to human or environmental health within its jurisdiction within 24 hours of the discovery of noncompliance, as required under section R.1 (and B.6 of Attachment C) of this Order.

Each Copermittee shall develop and submit criteria by which to evaluate events of non-compliance to determine whether they pose a threat to human or environmental health. These criteria shall be submitted in the Jurisdictional Urban Runoff Management Program Document and Annual Reports for SDRWQCB review.

Such oral notification shall be followed up by a written report to be submitted to the SDRWQCB within 5 days of the incidence of non-compliance as required under section R.1 (and B.6 of Attachment C) of this Order. Sites are considered non-compliant when one or more violations of local ordinances, permits, plans, or this Order exist on the site.

F.2.j. Education Focused on Construction Activities (Construction)

(1) Internal: Municipal Staff

Each Copermittee shall implement an education program to ensure that its construction, building, and grading review staffs and inspectors have an understanding of:

(a) Federal, state, and local water quality laws and regulations applicable to construction and grading activities.
(b) The connection between construction activities and water quality impacts (i.e., impacts from land development and urbanization).
(c) How erosion can be prevented.
(d) How impacts to receiving water quality resulting from construction activities can be minimized (i.e., through implementation of various source control and structural BMPs).
(e) Applicable topics listed in section F.4. of this Order.

(2) External: Project Applicants, Contractors, Developers, Property Owners, and other Responsible Parties

Each Copermittee shall implement an education program to ensure that project applicants, contractors, developers, property owners, and other responsible parties have an understanding of the topics outlined in section F.2.j.1. above of this Order.

F.3. Existing Development Component

Each Copermittee shall minimize the short and long-term impacts on receiving water quality from all types of existing development.

F.3.a. Municipal (Existing Development)

Each Copermittee shall implement a Municipal (Existing Development) Component to prevent or reduce pollutants in runoff from all municipal land use areas and activities. At a minimum the municipal component shall address:

F.3.a.(1) Pollution Prevention
F.3.a.(2) Source Identification
F.3.a.(3) Threat to Water Quality Prioritization
F.3.a.(4) BMP Implementation
F.3.a.(5) Maintenance of Municipal Separate Storm Sewer System
F.3.a.(6) Management of Pesticides, Herbicides, and Fertilizers
F.3.a.(7) Inspection of Municipal Areas and Activities
F.3.a.(8) Enforcement of Municipal Areas and Activities

F.3.a.(1) Pollution Prevention (Municipal)

Each Copermittee shall implement pollution prevention methods in its Municipal (Existing Development) Component and shall require its use by appropriate municipal departments and personnel, where appropriate.

F.3.a.(2) Source Identification (Municipal)

Each Copermittee shall develop, and update annually, a watershed based inventory of the name, address (if applicable), and description of all municipal land use areas and activities which generate pollutants. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended when applicable, but not required.

F.3.a.(3) Threat to Water Quality Prioritization (Municipal)

(a) To establish priorities for oversight of municipal areas and activities required under this Order, each Copermittee shall prioritize each watershed inventory in F.3.a.2. above by threat to water quality and update annually. Each municipal area and activity shall be classified as high, medium, or low threat to water quality. In evaluating threat to water quality, each Copermittee shall consider (1) type of municipal area or activity; (2) materials used; (3) wastes generated; (4) pollutant discharge potential; (5) non-storm water discharges; (6) size of facility or area; (7) proximity to receiving water bodies; (8) sensitivity of receiving water bodies; and (9) any other relevant factors.

(b) At a minimum, the high priority municipal areas and activities shall include the following:

i. Roads, Streets, Highways, and Parking Facilities.
ii. Flood Management Projects and Flood Control Devices.
iii. Areas and activities tributary to a Clean Water Act section 303(d) impaired water body, where an area or activity generates pollutants for which the water body is impaired. Areas and activities within or adjacent to or discharging

directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)vii of this Order).

iv. Municipal Waste Facilities.
- Active or closed municipal landfills;
- Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewage collection systems;
- Municipal separate storm sewer systems;
- Incinerators;
- Solid waste transfer facilities;
- Land application sites;
- Uncontrolled sanitary landfills;
- Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles;
- Sites for disposing and treating sewage sludge; and
- Hazardous waste treatment, disposal, and recovery facilities.

v. Other municipal areas and activities that the Copermittee determines may contribute a significant pollutant load to the MS4.

vi. Municipal airfields.

F.3.a.(4) BMP Implementation (Municipal)

(a) Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality municipal areas and activities (as determined under section F.3.a.(3)). The designated minimum BMPs for high threat to water quality municipal areas and activities shall be area or activity specific as appropriate.

(b) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the threat to water quality rating) at each municipal area or activity within its jurisdiction. If particular minimum BMPs are infeasible for any specific area or activity, each Copermittee shall implement, or require implementation of other equivalent BMPs. Each Copermittee shall also implement any additional BMPs as are necessary to comply with this Order.

i. Each Copermittee shall evaluate feasibility of retrofitting existing structural flood control devices and retrofit where needed.

(c) Each Copermittee shall implement, or require implementation of, any additional controls for municipal areas and activities tributary to Clean Water Act section 303(d) impaired water bodies (where an area or activity generates pollutants for which the water body is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for municipal areas and activities within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.3.a.(5) Maintenance of Municipal Separate Storm Sewer System (Municipal)

(a) Each Copermittee shall implement a schedule of maintenance activities at all structural controls designed to reduce pollutant discharges to or from its MS4s and related drainage structures.

(b) Each Copermittee shall implement a schedule of maintenance activities for the municipal separate storm sewer system.

(c) The maintenance activities must, at a minimum, include:

i. Inspection and removal of accumulated waste (e.g. sediment, trash, debris and other pollutants) between May 1 and September 30 of each year;

ii. Additional cleaning as necessary between October 1 and April 30 of each year;

iii. Record keeping of cleaning and the overall quantity of waste removed;

iv. Proper disposal of waste removed pursuant to applicable laws;

v. Measures to eliminate waste discharges during MS4 maintenance and cleaning activities.

F.3.a.(6) Management of Pesticides, Herbicides, and Fertilizers (Municipal)

The Copermittees shall implement BMPs to reduce the contribution of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from municipal areas and activities to MS4s. Important municipal areas and activities include municipal facilities, public rights-of-way, parks, recreational facilities, golf courses, cemeteries, botanical or zoological gardens and exhibits, landscaped areas, etc.

Such BMPs shall include, at a minimum: (1) educational activities, permits, certifications and other measures for municipal applicators and distributors; (2) integrated pest management measures that rely on non-chemical solutions; (3) the use of native vegetation; (4) schedules for irrigation and chemical application; and (5) the collection and proper disposal of unused pesticides, herbicides, and fertilizers.

F.3.a.(7) Inspection of Municipal Areas and Activities (Municipal)

At a minimum, each Copermittee shall inspect high priority municipal areas and activities annually. Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

F.3.a.(8) Enforcement of Municipal Areas and Activities (Municipal)

Each Copermittee shall enforce its storm water ordinance for all municipal areas and activities as necessary to maintain compliance with this Order.

F.3.b. Industrial (Existing Development)

Each Copermittee shall implement an Industrial (Existing Development) Component to reduce pollutants in runoff from all industrial sites. At a minimum the industrial component shall address:

F.3.b.(1) Pollution Prevention
F.3.b.(2) Source Identification
F.3.b.(3) Threat to Water Quality Prioritization
F.3.b.(4) BMP Implementation
F.3.b.(5) Monitoring of Industrial Sites
F.3.b.(6) Inspection of Industrial Sites
F.3.b.(7) Enforcement Measures for Industrial Sites
F.3.b.(8) Reporting of Non-compliant Sites

F.3.b.(1) Pollution Prevention (Industrial)

Each Copermittee shall implement pollution prevention methods in its Industrial (Existing Development) Component and shall require its use by industry, where appropriate.

F.3.b.(2) Source Identification (Industrial)

Each Copermittee shall develop and update annually a watershed-based inventory of all industrial sites within its jurisdiction regardless of site ownership. This requirement is applicable to all industrial sites regardless of whether the industrial site is subject the California statewide General NPDES Permit for Storm Water Discharges Associated With Industrial Activities, Except Construction (hereinafter General Industrial Permit) or other individual NPDES permit.

The inventory shall include the following minimum information for each industrial site: name; address; and a narrative description including SIC codes which best reflects the principal products or services provided by each facility. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

F.3.b.(3) Threat to Water Quality Prioritization (Industrial)

(a) To establish priorities for industrial oversight activities under this Order, the Copermittee shall prioritize each watershed-based inventory in F.3.b.(2) above by threat to water quality and update annually. Each industrial site shall be classified as high, medium, or low threat to water quality. In evaluating threat to water quality each Copermittee shall consider (1) type of industrial activity (SIC Code); (2) materials used in industrial processes; (3) wastes generated; (4) pollutant discharge potential; (5) non-storm water discharges; (6) size of facility; (7) proximity to receiving water bodies; (8) sensitivity of receiving water bodies; (9) whether the industrial site is subject to the statewide General Industrial Permit; and (10) any other relevant factors.

(b) At a minimum the high priority industrial sites shall include industrial facilities that are subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA); industrial facilities tributary to a Clean Water Act section 303(d) impaired water body, where a facility generates pollutants for which the water body is impaired; industrial facilities within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)vii of this Order); facilities subject to the statewide General Industrial Permit; and all other industrial facilities that the Copermittee determines are contributing significant pollutant loading to its MS4, regardless of whether such facilities are covered under the statewide General Industrial Permit or other NPDES permit.

F.3.b.(4) BMP Implementation (Industrial)

(a) Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality industrial sites (as determined under section F.3.b.(3)). The designated minimum BMPs for high threat to water quality industrial sites shall be industry and site specific as appropriate.

(b) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the site's threat to water quality rating) at each industrial site within its jurisdiction. If particular minimum BMPs are infeasible at any specific site, each Copermittee shall implement, or require implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order including BMPs which are more stringent than those required under the statewide General Industrial Permit.

(c) Each Copermittee shall implement, or require implementation of, additional controls for industrial sites tributary to Clean Water Act section 303(d) impaired water bodies (where a site generates pollutants for which the water body is impaired) as necessary to comply

with this Order. Each Copermittee shall implement, or require implementation of, additional controls for industrial sites within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.3.b.(5) Monitoring of Industrial Sites (Industrial)

(a) Each Copermittee shall conduct, or require industry to conduct, a monitoring program for runoff from each high threat to water quality industrial site (identified in F.3.b.(3) above). Group monitoring by multiple industrial sites conducted under group monitoring programs approved by the State Water Resources Control Board is acceptable.

(b) At a minimum, the monitoring program shall provide quantitative data from two storm events per year on the following constituents:

i. Any pollutant listed in effluent guidelines subcategories where applicable;
ii. Any pollutant for which an effluent limit has been established in an existing NPDES permit for the facility;
iii. Oil and grease or Total Organic Carbon (TOC);
iv. pH;
v. Total suspended solids (TSS);
vi. Specific conductance; and
vii. Toxic chemicals and other pollutants that are likely to be present in storm water discharges.

F.3.b.(6) Inspection of Industrial Sites (Industrial)

(a) Each Copermittee shall conduct industrial site inspections for compliance with its ordinances, permits, and this Order. Inspections shall include review of BMP implementation plans.

(b) Each Copermittee shall establish inspection frequencies and priorities as determined by the threat to water quality prioritization described in F.3.b.(3) above. Each Copermittee shall inspect high priority industrial sites, at a minimum:

i. Annually

OR

ii. Bi-annually for any site that the responsible Copermittee certifies in a written statement to the SDRWQCB all of the following (certified statements may be submitted to the SDRWQCB at any time for one or more sites):

- Copermittee has record of industrial site's Waste Discharge Identification Number (WDID#) documenting industrial site's coverage under the statewide General Industrial Permit; and
- Copermittee has reviewed the industrial site's Storm Water Pollution Prevention Plan (SWPPP); and
- Copermittee finds SWPPP to be in compliance with all local ordinances, permits, and plans; and
- Copermittee finds that the SWPPP is being properly implemented on site.

Each Copermittee shall inspect medium and low threat to water quality industrial sites as needed.

(c) Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

(d) To the extent that the SDRWQCB has conducted an inspection of a high priority industrial site during a particular year, the requirement for the responsible Copermittee to inspect this site during the same year will be satisfied.

F.3.b.(7) Enforcement of Industrial Sites (Industrial)

Each Copermittee shall enforce its storm water ordinance at all industrial sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include sanctions to ensure compliance. Sanctions shall include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

F.3.b.(8) Reporting of Non-compliant Sites (Industrial)

Each Copermittee shall provide oral notification to the SDRWQCB of non-compliant sites that are determined to pose a threat to human or environmental health within its jurisdiction within 24 hours of the discovery of noncompliance, as required under section R.1 (and B.6 of Attachment C) of this Order.

Each Copermittee shall develop and submit criteria by which to evaluate events of non-compliance to determine whether they pose a threat to human or environmental health. These criteria shall be submitted in the Jurisdictional Urban Runoff Management Program Document and Annual Reports for SDRWQCB review.

Such oral notification shall be followed up by a written report to be submitted to the SDRWQCB within 5 days of the incidence of non-compliance as required under section R.1(and B.6 of Attachment C) of this Order. Sites are considered non-compliant when one or more violations of local ordinances, permits, plans, or this Order exist on the site.

F.3.c. Commercial (Existing Development)

Each Copermittee shall implement a Commercial (Existing Development) Component to reduce pollutants in runoff from commercial sites. At a minimum the commercial component shall address:

F.3.c.(1) Pollution Prevention
F.3.c.(2) Source Identification
F.3.c.(3) BMP Implementation
F.3.c.(4) Inspection of Commercial Sites and Sources
F.3.c.(5) Enforcement of Commercial Sites and Sources

F.3.c.(1) Pollution Prevention (Commercial)

Each Copermittee shall implement pollution prevention methods in its Commercial (Existing Development) Component and shall require its use by commerce, where appropriate.

F.3.c.(2) Source Identification (Commercial)

Each Copermittee shall develop and update annually an inventory of the following high priority threat to water quality commercial sites/sources listed below. (If any commercial site/source listed below is inventoried as an industrial site, as required under section F.3.b.(2) of this Order, it is not necessary to also inventory it as a commercial site/source).

(a) Automobile mechanical repair, maintenance, fueling, or cleaning;
(b) Airplane mechanical repair, maintenance, fueling, or cleaning;
(c) Boat mechanical repair, maintenance, fueling, or cleaning;

(d) Equipment repair, maintenance, fueling, or cleaning;
(e) Automobile and other vehicle body repair or painting;
(f) Mobile automobile or other vehicle washing;
(g) Automobile (or other vehicle) parking lots and storage facilities;
(h) Retail or wholesale fueling;
(i) Pest control services;
(j) Eating or drinking establishments;
(k) Mobile carpet, drape or furniture cleaning;
(l) Cement mixing or cutting;
(m) Masonry;
(n) Painting and coating;
(o) Botanical or zoological gardens and exhibits;
(p) Landscaping;
(q) Nurseries and greenhouses;
(r) Golf courses, parks and other recreational areas/facilities;
(s) Cemeteries;
(t) Pool and fountain cleaning;
(u) Marinas;
(v) Port-a-Potty servicing;
(w) Other commercial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4;
(x) Any commercial site or source tributary to a Clean Water Act section 303(d) impaired water body, where the site or source generates pollutants for which the water body is impaired; and
(y) Any commercial site or source within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area (as defined in F.1.b(2)(a)vii of this Order).

The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

F.3.c.(3) BMP Implementation (Commercial)

(a) Each Copermittee shall designate a set of minimum BMPs for the high priority threat to water quality commercial sites/sources (listed above in section F.3.c.(2)). The designated minimum BMPs for the high threat to water quality commercial sites/sources shall be site and source specific as appropriate.

(b) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs at each high priority threat to water quality commercial site/source within its jurisdiction. If particular minimum BMPs are infeasible for any specific site/source, each Copermittee shall implement, or require the implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order.

(c) Each Copermittee shall implement, or require implementation of, additional controls for commercial sites or sources tributary to Clean Water Act section 303(d) impaired water bodies (where a site or source generates pollutants for which the water body is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for commercial sites or sources within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.3.c.(4) Inspection of Commercial Sites and Sources (Commercial)

Each Copermittee shall inspect high priority commercial sites and sources as needed. Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

F.3.c.(5) Enforcement of Commercial Sites and Sources (Commercial)

Each Copermittee shall enforce its storm water ordinance for all commercial sites and sources as necessary to maintain compliance with this Order.

F.3.d. Residential (Existing Development)

Each Copermittee shall implement a Residential (Existing Development) Component to prevent or reduce pollutants in runoff from all residential land use areas and activities. At a minimum the residential component shall address:

F.3.d.(1) Pollution Prevention
F.3.d.(2) Threat to Water Quality Prioritization
F.3.d.(3) BMP Implementation
F.3.d.(4) Enforcement of Residential Areas and Activities

F.3.d.(1) Pollution Prevention (Residential)

Each Copermittee shall include pollution prevention methods in its Residential (Existing Development) Component and shall encourage their use by residents, where appropriate.

F.3.d.(2) Threat to Water Quality Prioritization (Residential)

Each Copermittee shall identify high priority residential areas and activities. At a minimum, these shall include:

- Automobile repair and maintenance;
- Automobile washing;
- Automobile parking;
- Home and garden care activities and product use (pesticides, herbicides, and fertilizers);
- Disposal of household hazardous waste (e.g., paints, cleaning products);
- Disposal of pet waste;
- Disposal of green waste;
- Any other residential source that the Copermittee determines may contribute a significant pollutant load to the MS4;
- Any residence tributary to a Clean Water Act section 303(d) impaired water body, where the residence generates pollutants for which the water body is impaired; and
- Any residence within or directly adjacent to or discharging directly to a coastal lagoon or other receiving waters within an environmentally sensitive area (as defined in F.1.b.(2)(a)vii of this Order).

F.3.d.(3) BMP Implementation (Residential)

(a) Each Copermittee shall designate a set of minimum BMPs for high threat to water quality residential areas and activities (as required under section F.3.d.(2)). The designated minimum BMPs for high threat to water quality municipal areas and activities shall be area or activity specific.

(b) Each Copermittee shall require implementation of the designated minimum BMPs for high threat to water quality residential areas and activities. If particular minimum BMPs are infeasible for any specific site/source, each Copermittee shall require implementation of other equivalent BMPs. Each Copermittee shall also implement, or require implementation of, any additional BMPs as are necessary to comply with this Order.

(c) Each Copermittee shall implement, or require implementation of, any additional controls for residential areas and activities tributary to Clean Water Act Section 303(d) impaired water bodies (where a residential area or activity generates pollutants for which the water body is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for residential areas within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.3.d.(4) Enforcement of Residential Areas and Activities (Residential)

Each Copermittee shall enforce its storm water ordinance for all residential areas and activities as necessary to maintain compliance with this Order.

F.4. Education Component

Each Copermittee shall implement an Education Component using all media as appropriate to (1) measurably increase the knowledge of the target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to measurably change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment. At a minimum the education component shall address the following target communities:

- Municipal Departments and Personnel
- Construction Site Owners and Developers
- Industrial Owners and Operators
- Commercial Owners and Operators
- Residential Community, General Public, and School Children
- Quasi-Governmental Agencies/Districts (i.e., educational institutions, water districts, sanitation districts, etc.)

F.4.a. All Target Communities

At a minimum the Education Program for each target audience shall contain information on the following topics where applicable:

- State and Federal water quality laws
- Requirements of local municipal permits and ordinances (e.g., storm water and grading ordinances and permits)
- Impacts of urban runoff on receiving waters
- Watershed concepts (i.e., stewardship, connection between inland activities and coastal problems, etc.)
- Distinction between MS4s and sanitary sewers
- Importance of good housekeeping (e.g., sweeping impervious surfaces instead of hosing)
- Pollution prevention and safe alternatives
- Household hazardous waste collection
- Recycling

- BMPs: Site specific, structural and source control
- BMP maintenance
- Non-storm water disposal alternatives (e.g., all wash waters)
- Pet and animal waste disposal
- Proper solid waste disposal (e.g., garbage, tires, appliances, furniture, vehicles)
- Equipment and vehicle maintenance and repair
- Public reporting mechanisms
- Green waste disposal
- Integrated pest management
- Native vegetation
- Proper disposal of boat and recreational vehicle waste
- Traffic reduction, alternative fuel use
- Water conservation

F.4.b. Municipal, Construction, Industrial, Commercial, and Quasi-Governmental (educational institutions, water districts, sanitation districts, etc.) Communities

In addition to the topics listed in F.4.a. above, the Municipal, Construction, Industrial, Commercial, and Quasi-Governmental (Educational Institutions, Water Districts, Sanitation Districts) Communities shall also be educated on the following topics where applicable:

- Basic urban runoff training for all personnel
- Additional urban runoff training for appropriate personnel
- Illicit Discharge Detection and Elimination observations and follow-up during daily work activities
- Lawful disposal of catchbasin and other MS4 cleanout wastes
- Water quality awareness for Emergency/First Responders
- California's Statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction).
- California's Statewide General NPDES Permit for Storm Water Discharges Associated with Construction Activities
- SDRWQCB's General NPDES Permit for Groundwater Dewatering
- 401 Water Quality Certification by the SDRWQCB
- Statewide General NPDES Utility Vault Permit (NPDES No. CAG990002)
- SDRWQCB Waste Discharge Requirements for Dredging Activities
- Local requirements beyond statewide general permits
- Federal, state and local water quality regulations that affect development projects
- Water quality impacts associated with land development
- Alternative materials & designs to maintain peak runoff values
- How to conduct a storm water inspection
- Potable water discharges to the MS4
- Dechlorination techniques
- Hydrostatic testing
- Spill response, containment, & recovery
- Preventive maintenance
- How to do your job and protect water quality

F.4.c. Residential, General Public, School Children Communities

In addition to the topics listed in F.4.a. above, the Residential, General Public, and School Children Communities shall be educated on the following topics where applicable:

- Public reporting information resources
- Residential and charity car-washing

- Community activities (e.g., "Adopt a Storm Drain, Watershed, or Highway" Programs, citizen monitoring, creek/beach cleanups, environmental protection organization activities, etc.)

F.5. Illicit Discharge Detection and Elimination Component

Each Copermittee shall implement an Illicit Discharge Detection and Elimination Component containing measures to actively seek and eliminate illicit discharges and connections. At a minimum the Illicit Discharge Detection and Elimination Component shall address:

F.5.a Illicit Discharges and Connections
F.5.b Dry Weather Analytical Monitoring
F.5.c Investigation / Inspection and follow-up
F.5.d Elimination of Illicit Discharges and Connections
F.5.e Enforce Ordinance
F.5.f Prevent and Respond To Sewage Spills (Including from Private Laterals and Failing Septic Systems) and Other Spills
F.5.g Facilitate Public Reporting of Illicit Discharges and Connections – Public Hotline
F.5.h Facilitate Disposal of Used Oil and Toxic Materials
F.5.i Limit Infiltration From Sanitary Sewer to MS4

F.5.a. Illicit Discharges and Connections

Each Copermittee shall implement a program to actively seek and eliminate illicit discharges and connections into its MS4. The program shall address all types of illicit discharges and connections excluding those non-storm water discharges not prohibited by the Copermittee in accordance with Section B. of this Order.

F.5.b. Dry Weather Analytical Monitoring

Each Copermittee shall conduct dry weather analytical monitoring of MS4 outfalls within its jurisdiction to detect illicit discharges and connections in accordance with Attachment E of this Order.

F.5.c. Investigation / Inspection and Follow-Up

Each Copermittee shall investigate and inspect any portion of the MS4 that, based on dry weather analytical monitoring results or other appropriate information, indicates a reasonable potential for illicit discharges, illicit connections, or other sources of non-storm water (including non-prohibited discharge(s) identified in Section B. of this Order). Each Copermittee shall establish criteria to identify portions of the system where such follow-up investigations are appropriate.

F.5.d. Elimination of Illicit Discharges and Connections

Each Copermittee shall eliminate all detected illicit discharges, discharge sources, and connections immediately.

F.5.e. Enforce Ordinances

Each Copermittee shall implement and enforce its ordinances, orders, or other legal authority to prevent illicit discharges and connections to its MS4. Each Copermittee shall also implement and enforce its ordinance, orders, or other legal authority to eliminate detected illicit discharges and connections to it MS4.

F.5.f. Prevent and Respond to Sewage Spills (Including from Private Laterals and Failing Septic Systems) and Other Spills

Each Copermittee shall prevent, respond to, contain and clean up all sewage and other spills that may discharge into its MS4 from any source (including private laterals and failing septic systems). Spill response teams shall prevent entry of spills into the MS4 and contamination of surface water, ground water and soil to the maximum extent practicable. Each Copermittee shall coordinate spill prevention, containment and response activities throughout all appropriate departments, programs and agencies to ensure maximum water quality protection at all times.

Each Copermittee shall develop and implement a mechanism whereby it is notified of all sewage spills from private laterals and failing septic systems into its MS4. Each Copermittee shall prevent, respond to, contain and clean up sewage from any such notification.

F.5.g. Facilitate Public Reporting of Illicit Discharges and Connections - - Public Hotline

Each Copermittee shall promote, publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s. Each Copermittee shall facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by Copermittees. All storm water hotlines shall be capable of receiving reports in both English and Spanish 24 hours per day / seven days per week. Copermittees shall respond to and resolve each reported incident. All reported incidents, and how each was resolved, shall be summarized in each Copermittee's individual Jurisdictional URMP Annual Report.

F.5.h. Facilitate Disposal of Used Oil and Toxic Materials

Each Copermittee shall facilitate the proper management and disposal of used oil, toxic materials, and other household hazardous wastes. Such facilitation shall include educational activities, public information activities, and establishment of collection sites operated by the Copermittee or a private entity. Curbside collection of household hazardous wastes is encouraged.

F.5.i. Limit Infiltration From Sanitary Sewer to MS4/ Provide Preventive Maintenance of Both

Each Copermittee shall implement controls and measures to limit infiltration of seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. Each Copermittee that operates both a municipal sanitary sewer system and a MS4 shall implement controls and measures to limit infiltration of seepage from the municipal sanitary sewers to the MS4s that shall include overall sanitary sewer and MS4 surveys and thorough, routine preventive maintenance of both.

F.6. Public Participation Component

Each Copermittee shall incorporate a mechanism for public participation in the implementation of the Jurisdictional URMP.

F.7. Assessment of Jurisdictional URMP Effectiveness Component

a. As part of its individual Jurisdictional URMP, each Copermittee shall develop a long-term strategy for assessing the effectiveness of its individual Jurisdictional URMP. The long-term assessment strategy shall identify specific direct and indirect measurements that each Copermittee will use to track the long-term progress of its individual Jurisdictional URMP towards achieving improvements in receiving water quality. Methods used for assessing effectiveness shall include the following or their equivalent: surveys, pollutant loading

estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

b. As part of its individual Jurisdictional URMP Annual Report, each Copermittee shall include an assessment of the effectiveness of its Jurisdictional URMP using the direct and indirect assessment measurements and methods developed in its long-term assessment strategy.

F.8. Fiscal Analysis Component

Each Copermittee shall secure the resources necessary to meet the requirements of this Order. As part of its individual Jurisdictional URMP, each Copermittee shall develop a strategy to conduct a fiscal analysis of its urban runoff management program in its entirety. In order to demonstrate sufficient financial resources to implement the conditions of this Order, each Copermittee shall conduct an annual fiscal analysis as part of its individual Jurisdictional URMP Annual Report. This analysis shall, for each fiscal year covered by this Order, evaluate the expenditures (such as capital, operation and maintenance, education, and administrative expenditures) necessary to accomplish the activities of the Copermittee's urban runoff management program. Such analysis shall include a description of the source(s) of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.

G. IMPLEMENTATION OF JURISDICTIONAL URMP

Each Copermittee shall have completed full implementation of all requirements of the Jurisdictional URMP section of this Order no later than **365 days after adoption** of this Order, except as stated as follows: Each Copermittee's local SUSMP must be implemented within 180 days of approval of the model SUSMP in the public process by the SDRWQCB.

H. SUBMITTAL OF JURISDICTIONAL URMP DOCUMENT

The written account of the overall program to be conducted by each Copermittee within its jurisdiction during the five-year life of this Order is referred to as the "Jurisdictional URMP Document".

1. Individual – Each Copermittee shall submit to the Principal Permittee(s) an individual Jurisdictional URMP document which describes all activities it has undertaken or is undertaking to implement the requirements of each component of the Jurisdictional URMP section F. of this Order.

   a. At a minimum, the individual Jurisdictional URMP document shall contain the following information for the following components:

      (1) Construction Component

         (a) Which pollution prevention methods will be required for implementation, and how and where they will be required
         (b) Updated grading ordinances
         (c) A description of the modified construction and grading approval process
         (d) Updated construction and grading project requirements in local grading and construction permits
         (e) A completed watershed-based inventory of all construction sites
         (f) A completed prioritization of all construction sites based on threat to water quality
         (g) Which BMPs will be implemented, or required to be implemented, for each priority category
         (h) How BMPs will be implemented, or required to be implemented, for each priority category
         (i) Planned inspection frequencies for each priority category
         (j) Methods for inspection
         (k) A description of enforcement mechanisms and how they will be used

(l) A description of how non-compliant sites will be identified and the process for notifying the SDRWQCB, including a list of current non-compliant sites
(m) A description of the construction education program and how it will be implemented

(2) Municipal (Existing Development) Component

(a) Which pollution prevention methods will be required for implementation, and how and where they will be required
(b) A completed watershed-based inventory of all municipal land use areas and activities
(c) A completed prioritization of all municipal areas and activities based on threat to water quality
(d) Which BMPs will be implemented, or required to be implemented, for each priority category
(e) How BMPs will be implemented, or required to be implemented, for each priority category
(f) Municipal maintenance activities and schedules
(g) Management strategy for pesticides, herbicides, and fertilizer use.
(h) Planned inspection frequencies for the high priority category
(i) Methods for inspection
(j) A description of enforcement mechanisms and how they will be used

(3) Industrial (Existing Development) Component

(a) Which pollution prevention methods will be required for implementation, and how and where they will be required
(b) A completed watershed-based inventory of all industrial sites
(c) A completed prioritization of all industrial sites based on threat to water quality
(d) Which BMPs will be implemented, or required to be implemented, for each priority category
(e) How BMPs will be implemented, or required to be implemented, for each priority category
(f) A description of the monitoring program to be conducted, or required to be conducted
(g) Planned inspection frequencies for each priority category
(h) Methods for inspection
(i) A description of enforcement mechanisms and how they will be used
(j) A description of how non-compliant sites will be identified and the process for notifying the SDRWQCB, including a list of current non-compliant sites

(4) Commercial (Existing Development) Component

(a) Which pollution prevention methods will be required for implementation, and how and where they will be required
(b) A completed watershed-based inventory of high priority commercial sites
(c) Which BMPs will be implemented, or required to be implemented, for high priority sites
(d) How BMPs will be implemented, or required to be implemented, for high priority sites
(e) Planned inspection frequencies for high priority sites
(f) Methods for inspection
(g) A description of enforcement mechanisms and how they will be used

(5) Residential (Existing Development) Component

(a) Which pollution prevention methods will be encouraged for implementation, and how and where they will be encouraged
(b) A completed inventory of high priority residential areas and activities

(c) Which BMPs will be implemented, or required to be implemented, for high priority areas and activities
(d) How BMPs will be implemented, or required to be implemented, for high priority areas and activities
(e) A description of enforcement mechanisms and how they will be used

(6) Education Component

(a) A description of the content, form, and frequency of education efforts for each target community

(7) Illicit Discharges Detection and Elimination Component

(a) A description of the program to actively seek and eliminate illicit discharges and connections
(b) A description of dry weather analytical monitoring to be conducted to detect illicit discharges and connections (see Attachment E)
(c) A description of investigation and inspection procedures to follow-up on dry weather analytical monitoring results or other information which indicate potential for illicit discharges and connections
(d) A description of procedures to eliminate detected illicit discharges and connections
(e) A description of enforcement mechanisms and how they will be used
(f) A description of methods to prevent, respond to, contain, and clean up all sewage (including spills from private laterals and failing septic systems) and other spills in order to prevent entrance into the MS4
(g) A description of the mechanism to receive notification of spills from private laterals
(h) A description of efforts to facilitate public reporting of illicit discharges and connections, including a public hotline
(i) A description of efforts to facilitate proper disposal of used oil and other toxic materials
(j) A description of controls and measures to be implemented to limit infiltration of seepage from sanitary sewers to MS4s
(k) A description of routine preventive maintenance activities on the sanitary system (where applicable) and the MS4

(8) Public Participation Component

(a) A description of how public participation will be included in the implementation of the Jurisdictional URMP

(9) Assessment of Jurisdictional URMP Effectiveness Component

(a) A description of strategies to be used for assessing the long-term effectiveness of the individual Jurisdictional URMP.

(10) Fiscal Analysis Component

(a) A description of the strategy to be used to conduct a fiscal analysis of the urban runoff management program.

(11) Land-Use Planning for New Development and Redevelopment Component

(a) Workplan for inclusion in General Plan (or equivalent plan) of water quality and watershed protection principles and policies
(b) Development project requirements in local development permits
(c) Participation efforts conducted in the development of the Model SUSMP

(d) Environmental review processes revisions
(e) A description of the planning education program and how it will be implemented

(12) Fire Fighting

(a) A description of a program to reduce pollutants from non-emergency fire fighting flows identified by the Copermittee to be significant sources of pollutants.

b. Each Copermittee shall submit to the Principal Permittee(s) each part of its individual Jurisdictional URMP document by the dates specified by the Principal Permittee(s).

c. In addition to submittal of the Jurisdictional URMP document, each Copermittee shall submit to the SDRWQCB its own adopted local SUSMP consistent with the approved Model SUSMP, as described in section F.1.b.(2). of this Order. Each Copermittee's own local SUSMP, along with its amended ordinances, shall be submitted to the SDRWQCB within 180 days of the SDRWQCB's approval of the Model SUSMP.

2. Unified – The Principal Permittee(s) shall submit the unified Jurisdictional URMP document to the SDRWQCB. The unified Jurisdictional URMP document shall be submitted in two parts (the collected Jurisdictional URMPs and the model SUSMP).

The unified Jurisdictional URMP document submittal shall address the requirements of the entire Jurisdictional URMP sections F.1 – F.8. of this Order, with the exception of the local SUSMP requirements (which are to be implemented 180 days after approval of the model SUSMP by the SDRWQCB). The unified Jurisdictional URMP document submittal shall contain a section covering common activities conducted collectively by the Copermittees, to be produced by the Principal Permittee(s), and the twenty individual Jurisdictional URMP documents. The Principal Permittee(s) shall be responsible for the development and production of a stand alone Model SUSMP document meeting the requirements of section F.1.b.(2) of this Order. The Principal Permittee(s) shall submit the unified Jurisdictional URMP document, including the Model SUSMP, to the SDRWQCB within **365 days of adoption** of this Order.

3. Universal Reporting Requirements

All individual and unified Jurisdictional URMP document submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit its individual Jurisdictional Urban Runoff Management Program Document with a signed certified statement. The Principal Permittee(s) shall submit a signed certified statement referring to its individual Jurisdictional Urban Runoff Management Program Document, the section covering common activities conducted collectively by the Copermittees, and the Model SUSMP document meeting the requirements of section F.1.b.(2) of this Order as produced by the Principal Permittee(s).

I. SUBMITTAL OF JURISDICTIONAL URMP ANNUAL REPORT

1. Individual - Each individual Jurisdictional URMP Annual Report shall be a documentation of the activities conducted by each Copermittee during the past annual reporting period. Each Jurisdictional URMP Annual Report shall, at a minimum, contain the following:

a. Comprehensive description of all activities conducted by the Copermittee to meet all requirements of each component of the Jurisdictional URMP section of this Order;

F.1. Land-Use Planning for New Development and Redevelopment Component
F.2. Construction Component
F.3. Existing Development Component (Including Municipal, Industrial, Commercial, Residential, and Education)

F.4. Education Component
F.5. Illicit Discharge Detection and Elimination Component
F.6. Public Participation Component
F.7. Assessment of Jurisdictional URMP Effectiveness Component
F.8. Fiscal Analysis Component

b. Each Copermittee's accounting of all:
   (1) Reports of illicit discharges (i.e., complaints) and how each was resolved (indicating referral source);
   (2) Inspections conducted;
   (3) Enforcement actions taken; and
   (4) Education efforts conducted.

c. Public participation mechanisms utilized during the Jurisdictional URMP implementation process;

d. Proposed revisions to the Jurisdictional URMP;

e. A summary of all urban runoff related data not included in the annual monitoring report (e.g., special investigations);

f. Budget for upcoming year;

g. Identification of management measures proven to be ineffective in reducing urban runoff pollutants and flow; and

h. Identification of water quality improvements or degradation.

2. Unified - The unified Jurisdictional URMP Annual Report shall contain a section covering common activities conducted collectively by the Copermittees, to be produced by the Principal Permittee(s), and the twenty individual Jurisdictional URMP Annual Reports. Each Copermittee shall submit to the Principal Permittee(s) an individual Jurisdictional URMP Annual Report by the date specified by the Principal Permittee(s). The Principal Permittee(s) shall submit a unified Jurisdictional URMP Annual Report to the SDRWQCB by **January 31, 2003 and every January 31 thereafter.** The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2003 shall cover the reporting period July 1, 2001 to June 30, 2002.

3. Universal Reporting Requirements

   All individual and unified Jurisdictional URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit its individual Jurisdictional Urban Runoff Management Program Annual Report with a signed certified statement. The Principal Permittee(s) shall submit a signed certified statement referring to its individual Jurisdictional Urban Runoff Management Program Annual Report and the section covering common activities conducted collectively by the Copermittees as produced by the Principal Permittee(s).

J. WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM

1. Each Copermittee shall collaborate with other Copermittees within its watershed(s) as shown in Table 4. below to identify and mitigate the highest priority water quality issues/pollutants in the watershed(s).

2. Each Copermittee shall collaborate with all other Copermittees discharging urban runoff into the same watershed to develop and implement a Watershed Urban Runoff Management Program (Watershed URMP) for the respective watershed. Each Watershed URMP shall, at a minimum

contain the following:

a. An accurate map of the watershed (preferably in Geographical Information System [GIS] format) that identifies all receiving waters (including the Pacific Ocean); all Clean Water Act section 303(d) impaired receiving waters (including the Pacific Ocean); land uses; MS4s, major highways; jurisdictional boundaries; and inventoried commercial, construction, industrial, municipal sites, and residential areas.

b. An assessment of the water quality of all receiving waters in the watershed based upon (1) existing water quality data; and (2) annual watershed water quality monitoring that satisfies the watershed monitoring requirements of Attachment B ;

c. An identification and prioritization of major water quality problems in the watershed caused or contributed to by MS4 discharges and the likely source(s) of the problem(s);

d. An implementation time schedule of short and long-term recommended activities (individual and collective) needed to address the highest priority water quality problem(s). For this section, "short-term activities" shall mean those activities that are to be completed during the life of this Order and "long-term activities" shall mean those activities that are to be completed beyond the life of this Order;

e. An identification of the Copermittee(s) responsible for implementing each recommended activity, including the selection of the Lead Permittee(s) and the time schedule for implementation. In the event that a Lead Permittee is not selected and identified by the Copermittees in a watershed, the Copermittee identified in Table 4 as the Lead Permittee for that watershed shall be responsible for implementing the requirements of the Lead Permittee in that watershed by default;

f. A mechanism for public participation throughout the entire watershed URMP process;

g. A watershed based education program;

h. A mechanism to facilitate collaborative "watershed-based" (i.e., natural resource-based) land use planning with neighboring local governments in the watershed.

i. Long-term strategy for assessing the effectiveness of the Watershed URMP. The long-term assessment strategy shall identify specific direct and indirect measurements that will track the long-term progress of Watershed URMP towards achieving improvements in receiving water quality. Methods used for assessing effectiveness shall include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

Table 4. Copermittees by Watershed

RESPONSIBLE COPERMITTEE(S)	WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM	HYDROLOGIC UNIT OR AREA	MAJOR RECEIVING WATER BODIES
1. County of San Diego	Santa Margarita River	Santa Margarita HU (902.00)	Santa Margarita River and Estuary, Pacific Ocean
1. City of Escondido **2. City of Oceanside** 3. City of Vista 4. County of San Diego	San Luis Rey River	San Luis Rey HU (903.00)	San Luis Rey River and Estuary, Pacific Ocean
1. City of Carlsbad **2. City of Encinitas** 3. City of Escondido	Carlsbad	Carlsbad HU (904.00)	Batiquitos Lagoon San Elijo Lagoon Agua Hedionda Lagoon

RESPONSIBLE COPERMITTEE(S)	WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM	HYDROLOGIC UNIT OR AREA	MAJOR RECEIVING WATER BODIES
4. City of Oceanside 5. City of San Marcos 6. City of Solana Beach 7. City of Vista 8. County of San Diego			Buena Vista Lagoon and Tributary Streams Pacific Ocean
1. City of Del Mar 2. **City of Escondido** 3. City of Poway 4. City of San Diego 5. City of Solana Beach 6. County of San Diego	San Dieguito River	San Dieguito HU (905.00)	San Dieguito River and Estuary Pacific Ocean
1. City of Del Mar 2. City of Poway 3. City of San Diego 4. County of San Diego	Peñasquitos	Miramar Reservoir HA (906.10) Poway HA (906.20)	Los Peñasquitos Creek Los Peñasquitos Lagoon Pacific Ocean
1. City of San Diego	Mission Bay	Scripps HA (906.30) Miramar HA(906.40) Tecolote HA (906.50)	Mission Bay Pacific Ocean
1. City of El Cajon 2. City of La Mesa 3. City of Poway 4. City of San Diego 5. City of Santee 6. County of San Diego	San Diego River	San Diego HU (907.00)	San Diego River Pacific Ocean
1. City of Chula Vista 2. City of Coronado 3. City of Imperial Beach 4. City of La Mesa 5. City of Lemon Grove 6. City of National City 7. City of San Diego 8. County of San Diego **9. San Diego Unified Port District**	San Diego Bay	Pueblo San Diego HU (908.00) Sweetwater HU (909.00) Otay HU (910.00)	San Diego Bay Sweetwater River Otay River Pacific Ocean
1. City of Imperial Beach 2. City of San Diego 3. County of San Diego	Tijuana River	Tijuana (911.00)	Tijuana River and Estuary Pacific Ocean

- The Lead Watershed Copermittee for each watershed is highlighted

K. IMPLEMENTATION OF WATERSHED URMP

Each Copermittee shall have completed full implementation of all requirements of the Watershed URMP section of this Order no later than January 31, 2003 unless otherwise specified.

L. SUBMITTAL OF WATERSHED URMP DOCUMENT

The written account of the overall watershed program to be conducted by each Copermittee during the remaining life of this Order is referred to as the "Watershed URMP Document". The Watershed URMP is conducted concurrently with the Jurisdictional URMP.[6]

[6]As each Copermittee transitions from conducting its management program only within its jurisdiction to conducting it also throughout the entire watershed (with neighboring Copermittees), it is expected that many activities will continue on a jurisdictional level (e.g., enforcement of local ordinances and permits). Implementation of the Watershed URMP is not meant to replace, but to expand implementation of the Jurisdictional URMP. For this reason, it is necessary to report management activities on both levels. This can be accomplished either by submitting both a Jurisdictional URMP Annual Report and a Watershed URMP Annual Report or by submitting a single Watershed URMP Annual Report that contains two separate sections (i.e., watershed activities and jurisdictional activities). Information need only be reported once (to the extent something is covered in the Watershed URMP Annual Report, it need not be covered again the Jurisdictional URMP Annual Report).

1. Each Watershed Specific URMP document shall state how the member Copermittees within each watershed will develop and implement the requirements of the Watershed URMP section J. of this Order. The Copermittees responsible for each of the nine Watershed URMPs are specified in Table 4 above. The Lead Watershed Copermittee for each watershed is highlighted, unless a different Lead Watershed Copermittee is designated. Each Lead Watershed Copermittee shall be responsible for producing its respective Watershed URMP document, as well as for coordination and meetings amongst all member watershed Copermittees. Each Lead Watershed Copermittee is further responsible for the submittal of the Watershed URMP document to the Principal Permittee(s) by the date specified by the Principal Permittee(s).

   a. Each Watershed specific URMP document shall include:
      (1) A completed watershed map
      (2) A water quality assessment and watershed monitoring needed
      (3) Prioritization of water quality problems
      (4) Recommended activities (short and long term)
      (5) Individual Copermittee implementation responsibilities and time schedules for implementation
      (6) A description of watershed public participation mechanisms
      (7) A description of watershed education mechanisms
      (8) A description of the mechanism and implementation schedule for watershed-based land use planning
      (9) A strategy for assessing the long-term effectiveness of the Watershed URMP

2. Unified - The unified Watershed URMP document shall contain a section covering common activities conducted collectively by the Copermittees, to be produced by the Principal Permittee(s), and the nine Watershed Specific URMP documents. The Principal Permittee(s) shall submit the unified Watershed URMP document to the SDRWQCB by **January 31, 2003.**

3. Universal Reporting Requirements.

   All individual and unified Watershed URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit a signed certified statement covering its responsibilities in the specific Watershed URMP Document. The Principal Permittee(s) shall submit a signed certified statement referring to its specific Watershed URMP Document and the section covering common activities conducted collectively by the Copermittees as produced by the Principal Permittee(s).

M. SUBMITTAL OF WATERSHED URMP ANNUAL REPORT

1. Watershed Specific - Each Watershed Specific URMP Annual Report shall be a documentation of the activities conducted by watershed member Copermittees during the previous annual reporting period to meet the requirements of all components of the Watershed URMP section of this Order. Each Watershed URMP Annual Report shall, at a minimum, contain the following:

   a. Comprehensive description of all activities conducted by the watershed member Copermittees to meet all requirements of each component of Watershed URMP section J. of this Order

   b. Public participation mechanisms utilized during the Watershed URMP implementation process;
   c. Mechanism for watershed based land use planning;
   d. Assessment of effectiveness of Watershed URMP;
   e. Proposed revisions to the Watershed URMP;
   f. A summary of watershed effort related data not included in the annual monitoring report (e.g., special investigations); and
   g. Identification of water quality improvements or degradation.

2. Unified - The Unified Watershed URMP Annual Report shall contain a section covering common activities conducted collectively by the Copermittees, to be produced by the Principal Permittee(s), and the nine Watershed Specific URMP Annual Reports. Each Lead Watershed Copermittee shall submit to the Principal Permittee(s) a Watershed Specific URMP Annual Report by the date specified by the Principal Permittee(s). The Principal Permittee(s) shall submit the Unified Watershed URMP Annual Report to the SDRWQCB by January 31, 2004 and every January 31 thereafter. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2004 shall cover the reporting period July 1, 2002 to June 30, 2003.

3. Universal Reporting Requirements

   All individual and unified Watershed URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit a signed certified statement covering its responsibilities in the specific Watershed URMP Annual Report. The Principal Permittee(s) shall submit a signed certified statement referring to its specific Watershed URMP Annual Report and the section covering common activities conducted collectively by the Copermittees as produced by the Principal Permittee(s).

N. ALL COPERMITTEE COLLABORATION

1. Each Copermittee shall collaborate with all other Copermittees regulated under this Order to address common issues, promote consistency among Jurisdictional Urban Runoff Management Programs (Jurisdictional URMPs) and Watershed Urban Runoff Management Programs (Watershed URMPs), and to plan and coordinate activities required under this Order

   a. Management Structure - All Copermittees shall jointly execute and submit to the SDRWQCB no later than **365 days after adoption** of this Order, a Memorandum of Understanding, Joint Powers Authority, or other instrument of formal agreement which at a minimum provides a management structure for the following:

      - Designation of Joint Responsibilities
      - Decision making
      - Watershed activities;
      - Information management of data and reports, including the requirements under this Order; and
      - Any and all other collaborative arrangements for compliance with this Order.

   b. All Copermittees shall jointly develop a standardized format(s) for all reports required under this Order (e.g., annual reports, monitoring reports, fiscal analysis reports, and program effectiveness reports, etc.). The standardized reporting format(s) shall be used by all Copermittees and shall include protocols for electronic reporting. The Principal Permittee(s) shall submit the standardized format(s) to the SDRWQCB no later than **365 days after adoption** of this Order**.**

O. PRINCIPAL PERMITTEE RESPONSIBILITIES

Within 90 days of adoption of this Order, the Copermittees shall designate the Principal Permittee(s) and notify the SDRWQCB of the name(s) of the Principal Permittee(s). The Principal Permittee(s) may require the Copermittees to reimburse the Principal Permittee(s) for reasonable costs incurred while performing coordination responsibilities and other related tasks. The Principal Permittee(s) shall, at a minimum:

1. Serve as liaison(s) between the Copermittees and the SDRWQCB on general permit issues.

2. Coordinate permit activities among the Copermittees and facilitate collaboration on the development and implementation of programs required under this Order;

3. Integrate individual Copermittee documents and reports required under this Order into single unified documents and reports for submittal to the SDRWQCB as described below. If a reporting date falls on a non-working day or State holiday, then the report is to be submitted on the following working day.

   a. Unified Jurisdictional URMP Document – The Principal Permittee(s) shall submit the unified Jurisdictional URMP document in its entirety (including the model SUSMP) to the SDRWQCB within 365 days of the adoption of this Order.

      The Principal Permittee(s) shall be responsible for producing the sections of the unified Jurisdictional URMP document submittals covering common activities conducted by the Copermittees. The Principal Permittee(s) shall be responsible for the development and production of a stand alone Model SUSMP document meeting the requirements of section F.1.b.(2). of this Order. The Principal Permittee(s) shall also be responsible for collecting and assembling the individual Jurisdictional URMP document submittals covering the activities conducted by each individual Copermittee.

   b. Unified Jurisdictional URMP Annual Reports – The Principal Permittee(s) shall submit unified Jurisdictional URMP Annual Reports to the SDRWQCB by January 31 of each year, beginning on **January 31, 2003**. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2003 shall cover the reporting period July 1, 2001 to June 30, 2002.

      The Principal Permittee(s) shall be responsible for producing the section of the unified Jurisdictional URMP Annual Reports covering common activities conducted by the Copermittees. The Principal Permittee(s) shall also be responsible for collecting and assembling the individual Jurisdictional URMP Annual Reports covering the activities conducted by each individual Copermittee.

   c. Unified Watershed URMP Document – The Principal Permittee(s) shall submit the unified Watershed URMP document to the SDRWQCB by **January 31, 2003**. The Principal Permittee(s) shall be responsible for producing the section of the unified Watershed URMP document covering common activities conducted by the Copermittees. The Principal Permittee(s) shall also be responsible for collecting and assembling the watershed specific Watershed URMP documents covering the activities conducted by each individual Copermittee.

   d. Unified Watershed URMP Annual Report - The Principal Permittee(s) shall submit unified Watershed URMP Annual Reports to the SDRWQCB by January 31 of each year, beginning on **January 31, 2004**. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 3, 2004 shall cover the reporting period July 1, 2002 to June 30, 2003.

      The Principal Permittee(s) shall be responsible for producing the section of the unified Watershed URMP Annual Reports covering common activities conducted by the Copermittees. The Principal Permittee(s) shall also be responsible for collecting and assembling the watershed specific Watershed URMP Annual Reports covering the activities conducted by each individual Copermittee.

   e. Receiving Waters Monitoring and Reporting Program - The Principal Permittee(s) shall be responsible for the production and submittal of the Previous Monitoring and Future Recommendations Report. The report shall be submitted to the SDRWQCB within 180 days

of adoption of this Order.

f. Receiving Waters Monitoring and Reporting Program - The Principal Permittee(s) shall be responsible for the development and production of the Receiving Waters Monitoring Program as it is outlined in Attachment B. The Principal Permittee(s) shall submit the Receiving Waters Monitoring Program to the SDRWQCB within 180 days of adoption of this Order.

g. Receiving Waters Monitoring and Reporting Program - The Principal Permittee(s) shall submit the Receiving Waters Monitoring Annual Report to the SDRWQCB on January 31 of each year, beginning on January 31, 2003.

h. Formal Agreements/Standardized Formats - The Principal Permittee(s) shall submit to the SDRWQCB, within 365 days of adoption of this Order, a formal agreement between the Copermittees which provides a management structure for meeting the requirements of this Order (as described in section N.1.a.). The Principal Permittee(s) shall submit to the SDRWQCB, within 365 days of adoption of this Order, standardized formats for all reports and documents required under this Order.

i. Dry Weather Analytical Monitoring - The Principal Permittee(s) shall collectively submit the Copermittees' dry weather analytical monitoring maps and procedures to the SDRWQCB within 365 days of adoption of this Order.

P. RECEIVING WATERS MONITORING AND REPORTING PROGRAM

1. Pursuant to California Water Code section 13267, each Copermittee shall comply with Monitoring and Reporting Program for No. 2001-01 contained in **Attachment B** of this Order.

2. Each Copermittee shall also comply with standard provisions, reporting requirements, and notifications contained in **Attachment C** of this Order.

Q. TASKS AND SUBMITTAL SUMMARY

The tasks and submittals required under this Order are summarized in Tables 5 and 6 below:

Table 5. Task Summary

Task No.	Task	Permit Section	Completion Date	Frequency
1	Identify discharges not to be prohibited and BMPs required for treatment of discharges not prohibited	B.3.	365 days after adoption of Order	One Time
2	Examine field screening results to identify water quality problems resulting from non-prohibited non-storm water discharges, including follow-up of problems	B.5	January 31, 2003	Annually
3	Notify SDRWQCB of discharges causing or contributing to an exceedance of water quality standards	C.2.a.	Immediate	As Needed
4	Establish adequate legal authority to control pollutant discharges into and from MS4	D.1.	180 days after adoption of Order	One Time
5	Assess General Plan to incorporate water quality and watershed protection principles	F.1.a.	365 days after adoption of Order	One Time
6	Include Development Project Requirements in local permits	F.1.b.(1).	365 days after adoption of Order	One Time
7	Develop Model SUSMP	F.1.b.(2).	365 days after adoption of Order	One Time
8	Develop and adopt individual local SUSMP and amended ordinances	F.1.b.(2).	180 days after approval of Model SUSMP by SDRWQCB	One Time
9	Implement individual jurisdictional SUSMP	F.1.b.(2).	180 days after approval of Model	Continuous

			SUSMP by SDRWQCB	
10	Revise environmental review processes	F.1.c.(1).	365 days after adoption of Order	One Time
11	Conduct education program for municipal planning and development review staff, project applicants, developers, contractors, community planning groups, and property owners	F.1.d.(1). And F.1.d.(2).	365 days after adoption of Order	Ongoing
12	Implement all requirements of Construction Component of Jurisdictional URMP	F.2.a. – F.2.j.	365 days after adoption of Order	Ongoing
13	Notify SDRWQCB of non-compliant construction sites that pose a threat to human or environmental health	F.2.i	Within 24 hours of discovery of noncompliance	As Needed
14	Implement all requirements of Municipal Existing Development Component of Jurisdictional URMP	F.3.a.(1). – F.3.a.(8).	365 days after adoption of Order	Ongoing
15	Implement all requirements of Industrial Existing Development Component of Jurisdictional URMP	F.3.b.(1) – F.3.b.(8)	365 days after adoption of Order	Ongoing
16	Notify SDRWQCB of non-compliant industrial sites that pose a threat to human or environmental health	F.3.b.8	Within 24 hours of discovery of noncompliance	As Needed
17	Implement all requirements of Commercial Existing Development Component of Jurisdictional URMP	F.3.c.(1) – F.3.c.(5)	365 days after adoption of Order	Ongoing
18	Implement all requirements of Residential Existing Development Component of Jurisdictional URMP	F.3.d.(1) – F.3.d.(4)	365 days after adoption of Order	Ongoing
19	Implement all requirements of Education Component of Jurisdictional URMP	F.4.a. – F.4.c.	365 days after adoption of Order	Ongoing
20	Implement all requirements of Illicit Discharge Detection and Elimination Component of Jurisdictional URMP	F.5.a. – F.5.i.	365 days after adoption of Order	Ongoing
21	Implement all requirements of Public Participation Component of Jurisdictional URMP	F.6.	365 days after adoption of Order	Ongoing
22	Develop strategy for assessment of Jurisdictional URMP effectiveness	F.7.a.	365 days after adoption of Order	One Time
23	Assess Jurisdictional URMP effectiveness	F.7.b.	January 31, 2003	Annually
24	Develop strategy for fiscal analysis of urban runoff management program	F.8.	365 days after adoption of Order	One Time
25	Conduct fiscal analysis of urban runoff management program in entirety	F.8.	January 31, 2003	Annually
26	Develop and implement Watershed URMP	J.2.	January 31, 2003	Ongoing
27	Execute formal agreement which provides management structure for meeting Order requirements	N.1.a.	365 days after adoption of Order	One Time
28	Develop standardized formats for all required reports of this Order	N.1.b.	365 days after adoption of Order	One Time
29	Develop Previous Monitoring and Future Recommendations Report	Attachment B	180 days after adoption of Order	One Time
30	Develop Receiving Waters Monitoring Program	Attachment B	180 days after adoption of Order	One Time
31	Implement Receiving Waters Monitoring Program	Attachment B	180 days after adoption of Order	Continuous
32	Develop dry weather analytical and field screening monitoring map and procedures	Attachment E	365 days after adoption of Order	One Time
33	Conduct dry weather analytical and field screening monitoring	Attachment E	May 1, 2002	Annually
34	Complete NPDES applications for issuance of renewal watershed based permits	Attachment C	At least 180 days prior to expiration of Order	One Time
35	Notify SDRWQCB of any incidence of non-compliance with this Order that poses a threat to human or environmental health.	R.1, B.6 of Attachment C	Within 24 hours of discovery of non-compliance	As Needed
36	Designate Principal Permittee(s) and notify SDRWQCB	O.	90 days after adoption of the	One Time

			Order	

Table 6. Submittal Summary

Submittal No.	Submittal	Permit Section	Completion Date	Frequency
1	Submit identification of discharges not to be prohibited and BMPs required for treatment of discharges not prohibited	B.3.	365 days after adoption of Order	One Time
2	Report on discharges causing or contributing to an exceedance of water quality standards, including description of BMP implementation	C.2.a.	With individual Jurisdictional URMP Annual Reports	As Needed
3	Submit Certified Statement of Adequate Legal Authority	D.2.	180 days after adoption of Order	One Time
4	Submit certified statement if particular high priority construction sites are to be inspected monthly rather than weekly in the rainy season	F.2.g.(2).	365 days after adoption of Order and as needed thereafter	As Needed
5	Submit report on non-compliant construction sites that pose a threat to human or environmental health.	F.2.i.	Within 5 Days of discovery of non-compliance	As Needed
6	Submit report on non-compliant industrial sites that pose a threat to human or environmental health.	F.3.b.8.	Within 5 days of discovery of non compliance	As Needed
7	Submit to Principal Permittee(s) individual Jurisdictional URMP document covering requirements for all Components	H.1.a.	Prior to 365 days after adoption of Order (Principal Permittee(s) specifies date of submittal)	One Time
8	(This space reserved).			
9	Principal Permittee(s) shall submit to SDRWQCB unified Jurisdictional URMP document covering requirements for all Components, including Model SUSMP	H.2.a.	365 days after adoption of Order	One Time
10	(This space reserved).			
11	Submit to SDRWQCB local SUSMP and amended ordinances	F.1.b.(2). and H.1.d.	180 days after approval of Model SUSMP	One Time
12	Submit to Principal Permittee(s) individual Jurisdictional URMP Annual Report	I.1.	Prior to January 31, 2003 (Principal Permittee(s) specifies date of submittal)	Annually
13	Principal Permittee(s) shall submit 1st unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2003	One Time and Annually Thereafter
14	Submit to Principal Permittee(s) Watershed Specific URMP document	L.1.	Prior to January 31, 2003 (Principal Permittee(s) specifies date of submittal)	One Time
15	Principal Permittee(s) shall submit unified Watershed Specific URMP document to SDRWQCB	L.2.	January 31, 2003	One Time
16	Principal Permittee(s) shall submit 2nd unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2004	One Time
17	Submit to Principal Permittee(s) Watershed Specific URMP Annual Report	M.1.	Prior to January 31, 2004 (Principal Permittee(s) specifies date of submittal)	Annually
18	Principal Permittee(s) shall submit 1st unified Watershed Specific URMP Annual Report to SDRWQCB	M.2.	January 31, 2004	One Time and Annually Thereafter
19	Principal Permittee(s) shall submit 3rd unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2005	One Time

20	Principal Permittee(s) shall submit 2nd unified Watershed Specific URMP Annual Report to SDRWQCB	M.2.	January 31, 2005	One Time
21	Principal Permittee(s) shall submit 4th unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2006	One Time
22	Principal Permittee(s) shall submit 3rd unified Watershed Specific URMP Annual Report to SDRWQCB	M.2.	January 31, 2006	One Time
23	Principal Permittee(s) shall submit 5th unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2007	One Time
24	Principal Permittee(s) shall submit formal agreement between Copermittees which provides management structure for meeting Order requirements	N.1.a.	365 days after adoption of Order	One Time
25	Principal Permittee(s) shall submit standardized formats for all reports required under this Order	N.1.b.	365 days after adoption of Order	One Time
26	Principal Permittee(s) submits Previous Monitoring and Future Recommendations Report to SDRWQCB	Attachment B	180 days after adoption of Order	One Time
27	Principal Permittee(s) submits Receiving Waters Monitoring Program document to SDRWQCB	Attachment B	180 days after adoption of Order	One Time
28	Principal Permittee(s) submits Receiving Waters Monitoring Annual Report to SDRWQCB	Attachment B	January 31, 2003	Annually
29	Submit to Principal Permittee(s) dry weather analytical monitoring map and procedures	Attachment E	Prior to 365 days after adoption of Order	One Time
30	Principal Permittee(s) submits collective dry weather analytical monitoring maps and procedures	Attachment E	365 days after adoption of Order	One Time
31	Submit to Principal Permittee(s) dry weather analytical monitoring results as part of individual Jurisdictional URMP Annual Report	Attachment E	Prior to January 31, 2003, as part of individual Jurisdictional URMP Annual Report	Annually
32	Principal Permittee(s) shall submit NPDES applications for issuance of renewal watershed based permits	Attachment C	At least 180 days prior to expiration of this Order	One Time
33	Submit reports of any incidence of non-compliance with this Order that poses a threat to human or environmental health.	R.1, B.6 of Attachment C	Within 5 days of discovery of non compliance	As Needed

R. STANDARD PROVISIONS, REPORTING REQUIREMENTS AND NOTIFICATIONS

1. Each Copermittee shall comply with Standard Provisions, Reporting Requirements, and Notifications contained in **Attachment C** of this Order. This includes 24 hour/5day reporting requirements for any instance of non-compliance with this Order as described in section B.6 of Attachment C.

2. All plans, reports and subsequent amendments submitted in compliance with this Order shall be implemented immediately (or as otherwise specified) and shall be an enforceable part of this Order upon submission to the SDRWQCB. All submittals by Copermittees must be adequate to implement the requirements of this Order.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 21, 2001, as amended by State Water Resources Control Board Order WQ 2001-15 adopted November 15, 2001.

_____
John H. Robertus
Executive Officer

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FACT SHEET/TECHNICAL REPORT

FOR

SDRWQCB ORDER NO. 2001-01

MUNICIPAL STORM WATER PERMIT
FOR
SAN DIEGO COUNTY AND CITIES

San Diego Regional Water Quality Control Board
November 6, 2001

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LIST OF ABBREVIATIONS

BAT	Best Available Technology
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CWA	Clean Water Act
CWC	California Water Code
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NURP	Nationwide Urban Runoff Program
SANDAG	San Diego Association of Governments
SDRWQCB	San Diego Regional Water Quality Control Board
SUSMP	Standard Urban Storm Water Mitigation Plan
SWRCB	State Water Resources Control Board
SWPPP	Storm Water Pollution Prevention Plan
TAC	State Water Resources Control Board Urban Runoff Technical Advisory Committee
TMDL	Total Maximum Daily Load
URMP	Urban Runoff Management Program
US EPA	United States Environmental Protection Agency

I. FACT SHEET/TECHNICAL REPORT FORMAT

The purpose of this Fact Sheet/Technical Report is to give the Copermittees and the interested public an overview of the permit and a practical discussion of its requirements, as well as a clear explanation of the regulatory justification for the permit requirements. The Fact Sheet/Technical Report can be considered to consist of two primary parts. The first part (which includes sections I. through V.) contains general information regarding urban runoff and the permit, including a summary of the permit in section IV. This part of the Fact Sheet/Technical Report provides an overview of the permit and the reasoning behind its requirements, and is likely to be the most pertinent part of the Fact Sheet/Technical Report for the more casual reader.

The second part of the Fact Sheet/Technical Report (which includes sections VI. and VII.) contains more detailed practical discussions and regulatory justifications of each permit component, and is meant to be used as a reference document during review of the permit. In sections V. and VI. of this Fact Sheet/Technical Report, each component of the permit is displayed in italics, followed by a discussion of the permit component. Section VII. (which addresses permit directives) also includes appropriate legal authority citations for each permit component. Each permit component is broken down in this manner so that the reader may find "stand alone" justification for each issue or permit component. This allows the Fact Sheet/Technical Report to be used as a reference during review of the permit. Please note that this has led to some repetition, as justifications for different sections are often similar or identical.

The text in the second part of the Fact Sheet/Technical Report (sections VI. and VII.) refers to the version of the permit provided to the San Diego Regional Water Quality Control Board (SDRWQCB) on October 11, 2000. The October 11, 2000 version of the permit is largely indicative of the final version of the permit, dated February 21, 2001. However, some minor changes to the permit were made between October 11, 2000 and February 21, 2001. To ensure that the final Fact Sheet/Technical Report is up to date and addresses the final permit in its entirety, Attachments 5 and 6 have been included in the final Fact Sheet/Technical Report. These attachments specifically address any changes to the permit not addressed in sections VI. and VII. of the Fact Sheet/Technical Report. Attachment 5 exhibits changes made to the permit between October 11, 2000 and February 21, 2001 in a redline strikeout version of the permit. Attachment 6 is a "response to comments" document which clarifies the reasoning behind each change to the permit found in the redline strikeout version of the permit. In this manner, the final Fact Sheet/Technical Report comprehensively addresses the contents of the final permit adopted by the SDRWQCB.

II. BACKGROUND – IMPACTS OF URBAN RUNOFF

Urban runoff is fundamentally important to the water quality of Southern California. It has been found to be a leading cause of water quality impairment in the San Diego Region and nationwide. Untreated pollutants in urban runoff, indiscriminate of dry or wet weather conditions, routinely find their way to our creeks, lagoons, bays, and ocean as easily from over watering of residential lawns as from rainstorms. San Diego area urban runoff is commonly contaminated with pesticides, fertilizers, animal droppings, trash, food wastes, automotive byproducts, and many other toxic substances which are generated by our urban environment. Water that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through storm drain networks directly to the receiving waters of the region. Southern California, with the highest coastal population density of the entire country,[1] suffers multiple tribulations from this urban generated pollution source.

The United States Environmental Protection Agency (US EPA) recognizes urban wet weather flows as the number one source of estuarine pollution in coastal communities.[2] This trend is reflected locally by the 1998-1999 City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program Report, which names urban runoff as one of the most significant contributors of pollution to our waterways and coastal areas. Furthermore, this document reports that monitoring efforts indicate that instream concentrations of pathogen indicators (fecal coliform and streptococcus) and heavy metals (such as cadmium, copper, lead, and zinc) exceed state and federal water quality criteria. Storm water within the region has also been found to contain the pesticides diazinon and chlorpyrifos (Dursban) at levels that can cause chronic or acute toxicity. [3]

Urban runoff causes many impacts in Southern California, including increased public health risks, high concentrations of toxic metals in harbor and ocean sediments, and toxicity to aquatic life.[4] A study exploring the health risks associated with urban runoff in Southern California was conducted in 1995 by the Santa Monica Bay Restoration Project using a survey of 15,000 bathers at three Santa Monica beaches. The study concluded that there is a 57% higher rate of illness in swimmers

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[1] Culliton, T.M. et al. 1988. "50 years of population changes along the nation's coast." *Coastal Trends Series, Report No. 2*. National Oceanic and Atmospheric Administration, Strategic Assessments Branch. As cited in Moore, S. L., et al. *Composition and Distribution of Beach Debris in Orange County, California*. Southern California Coastal Water Research Project, Southern California Marine Institute, Divers Involved Voluntarily in Environmental Rehabilitation and Safety.

[2] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

[3] City of San Diego. 1999. 1989-1999 City of San Diego and Co-permittee NPDES Stormwater Monitoring Program Report. URS Greiner Woodward Clyde.

[4] Threats to beneficial uses such as swimming and seafood consumption or ecosystem health have been demonstrated in numerous studies. Two important studies to note for Southern California are: Bay, S., Jones, B.H. and Schiff, K. 1999. Study of the Impact of Stormwater Discharge on Santa Monica Bay. Sea Grant Program, University of Southern California; and Haile, R.W., et al. 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.

who swim adjacent to storm drains than in swimmers who swim more than 400 yards away from storm drains.

This potential for public health risks resulting from urban runoff is reflected in the San Diego region as well. In 1999, there were 29 days in which the San Diego County Health Department issued general advisories to avoid waters 300 feet either side of all storm drain outlets in order to protect the public from potential adverse health effects caused by urban runoff. Also, in 1999 there were 720 combined beach closures and postings in San Diego County. The San Diego County Department of Health does not recommend the public recreate in closed or posted waters due to associated health risk. A breakdown of the beach closure and posting data is as follows: 127 of these closings were related to sewage spills, 71 related to river mouth outlets or some other excavation, and 522 of the days were related to some exceedance of water quality standards.[5] Urban runoff can also impact drinking water; contamination by urban runoff has forced the closure of potable water reservoirs within the City of San Diego in order to protect public health.

The SDRWQCB finds that such problems are indeed frequently urban runoff related. For instance, a common conveyance for a sewage spill to reach a beach is through the municipal storm water system. Also, exceedances of standards at some of our Region's beaches have unquestionably been conveyed by the storm water drainage system.[6] In addition, urban runoff is increasingly being targeted as the cause of beach closures and postings in other areas of the San Diego region and Southern California. Urban runoff has been identified as a principal contributor to fecal coliform contamination in Orange County's Aliso Creek, a creek which often causes beach postings when flowing into the ocean.[7] Municipal enforcement efforts focusing on urban runoff have also resulted in reduced coliform levels in receiving waters in Encinitas.[8] Finally, US EPA goes on to say that urban storm water runoff and sewer overflows have become the largest cause of beach closings in the United States for the previous three years, becoming more significant than such sources as oil spills and publicly owned treatment works.[9]

Regardless of how beach posting and closure data is interpreted, one thing is clear: Beneficial uses are not being met for the waters in the San Diego Region, and urban runoff is a significant contributor to this receiving water impairment. For San Diego, known throughout the world for its beach lifestyle, these statistics are bound to have increasingly serious effects on tourism revenue as well as the local cultural identity.

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[5] Information provided by the San Diego County Department of Public Health.

[6] SDRWQCB Cleanup and Abatement Order No. 97-69 and Cease and Desist Order No. 98-74, both were issued to the City of Coronado.

[7] SDRWQCB Cleanup and Abatement Order No. 99-211, issued to the City of Laguna Niguel and the County of Orange.

[8] Kathy Weldon, City of Encinitas, Presentation to Beach Water Quality Workgroup, June 1, 2000.

[9] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

III. ECONOMIC ISSUES

Polluted urban runoff not only poses a public health threat, but an economic one as well. A January 5, 1997 New York Times article warns: *Travel Advisory. Storm Drains Pose San Diego Health Risk*.[10] In the July 3, 2000 edition of Forbes Magazine, an article entitled *Don't Go Near the Water. Beaches That Make You Go Ewwwww*!, two San Diego area beaches are highlighted as having troubles. The article is particularly hard on the Mission Bay beaches, in stating, "If San Diego County has established itself as the California capital of sewage spills, this beach is its White House."[11] Our local problems do indeed make national news. US EPA also brings attention to our region in the guidance document *Liquid Assets 2000* in saying, "Although our lakes, rivers, estuaries, and wetlands are much cleaner than they were in 1970, headlines like these are all too common…"[12] Next to the quote is pictured the San Diego page from the San Diego Union Tribune bearing the headline "Human Waste Fouls Three Beaches, DNA Tests Find."[13] Being spotlighted by the federal government in this context is definitely less than auspicious.

There may be no way to measure what effects such negative press have had on value lost due to changed vacation plans. However, one can presume that continued publicity will take its toll on local economies. According to a 1996 San Diego Association of Governments (SANDAG) Memorandum, the California Division of Tourism has estimated that each out-of-state visitor spends $101.00 a day. The memo goes on to state that based on projections from the California Department of Boating and Waterways nearly $1.2 billion in direct revenue and $1.2 billion in indirect revenue is pumped into the San Diego area economy each year by out-of-state visitors.[14] It would seem that given the importance of tourism to our area, municipalities cannot afford to ignore water quality. The bottom line is that there is no need to wait and see how much the waters can take before our economy is affected. We can simply look to catastrophes that other regions have already had to bear. The 1988 medical waste wash-ups closing New York and New Jersey beaches caused an estimated $4 billion loss to the local economy.[15]

"Willingness to pay" gives an indication of how much the public values clean water. A study conducted by Colorado State University researchers on a 45 mile stretch of

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[10] Kopytoff, V.G. 1/5/1997. *Travel Advisory: Storm Drains Pose San Diego Health Risk*. The New York Times.

[11] Powers, K. 7/3/2000. *Don't Go Near the Water. Beaches That Make You Go Ewwwww*! Forbes Magazine.

[12] US EPA. 2000. Liquid Assets 2000. *America's Water Resources at a Turning Point*. EPA –840-B-00-001.

[13] Rodgers, T. 1/21/00. Human Waste Fouls 3 Beaches, DNA Tests find. The San Diego Union-Tribune.

[14] San Diego Association of Governments. 10/25/96. *Memorandum: California Department of Boating and Waterways: Unpublished Survey Information Regarding Beach Use*. Written to the Shoreline Erosion Committee.

[15] US EPA. 1996. Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy. EPA 800-R-96-002. Page 5.

the South Platte River looked at the value of ecosystem services. The services studied were habitat for fish and wildlife, recreation, erosion control, natural purification of water and dilution of wastewater. Results from nearly 100 in-person interviews show that households would pay on average $21 per month for additional ecosystem services.[16] The article goes on to explain that while the marginal benefits are often quite small per person, the non-rival nature of environmental goods often results in simultaneous enjoyment by millions of people. Therefore, ensuring dependable good water quality could mean huge social benefits. The National Water Research Institute states, "Water has a psychological value…People derive measurable pleasure from recreational activities like boating and fishing and find comfort in knowing that the water they drink is of the highest quality."[17]

Water quality as an externality can also cause shifts in real estate value. To help assess this we consider other areas of the country. US EPA looked at a study conducted on real estate around Lake Champlain in the Northeastern United States. Property values in the area of the lake with good water quality were valued an average of 20% more than property around poor water quality.[18] Research right here in California indicates that property values can increase by at least 3% for employing bank stabilization procedures and up to 11% for improving fishing habitat.[19]

Within the past decade or so we see that investor's concerns about environmental quality do indeed drive investment decisions. *Money* magazine conducts a "Best Places to Live" survey every year. In 1995, clean water and air ranked as the most important factors in choosing a place to live. It is important to note that they were ranked above typical high priority quality of life issues such as low crime rates, plentiful doctors or hospitals, and low taxes.[20] In the 2000 *Money* magazine "Best Places to Live" analysis, clean water was cited as a contributing factor in three of the

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[16] Loomis J., et al. 1999. Measuring the Total Economic Value of Restoring Ecosystem Services in an Impaired River Basin: Results from a Contingent Valuation Method Survey. Proceedings of the Third Workshop in the Environmental Policy and Economics Workshop Series. Sponsored by US EPA's Offices of Economy & Environment, and Reserved & Development. April 21-22, 1999.

[17] National Water Research Institute. The Value of Water: Recognizing and Using the Full Water Supply. National Water Research Institute, Fountain Valley, CA as cited in US EPA. 2000. Liquid Assets 2000. *America's Water Resources at a Turning Point*. EPA –840-B-00-001.

[18] US EPA. 1996. Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy. EPA 800-R-96-002. Page 8.

[19] Streiner C. and Loomis. J. 1996. Estimating the Benefits of Urban Stream Restoration Using the Hedonic Price Method. Rivers 5(4): 267-268 as cited in Loomis J., et al. 1999. Measuring the Total Economic Value of Restoring Ecosystem Services in an Impaired River Basin: Results from a Contingent Valuation Method Survey. Proceedings of the Third Workshop in the Environmental Policy and Economics Workshop Series. Sponsored by US EPA's Offices of Economy & Environment, and Reserved & Development. April 21-22, 1999.

[20] US EPA. 1996. Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy. EPA 800-R-96-002. Page 9.

top six choices from around the country.[21] Needless to say, San Diego did not make the list this year.

The SANDAG *Regional Growth Management Strategy, Water Quality Element* summarizes future needs in development strategies by stating, "Protecting the health of the water bodies in the region calls for a new approach to storm water management in new development and redevelopment, an approach which considers the possibilities for *pollution prevention* and maximizing infiltration."[22] However, many stakeholders feel that the prospect of such planning presents an economic burden. Not so, according to a *Watershed Protection Techniques* article, "The Benefits of Better Site Design in Residential Subdivision."[23] The journal did a comparative hydrology analysis for a medium-density residential subdivison using open space and conventional design. The following table shows the environmental benefits of using an open space versus conventional design.

Table One: Change in Site Characteristics from a Conventional Design to Open Space Design (*Both employ storm water protection practices*).

Factor of Concern	Percent Change by Applying Open Space Design
Impervious cover	24% decrease
Residential Lawn	48% decrease
Stormwater Runoff	24% decrease
Stormwater Infiltration	55% increase
Phosphorus Export	60% decrease
Nitrogen Export	45% decrease
Development Cost	20% decrease

Source: Adapted from the Center for Watershed Protection, 2000.

It's no surprise that environmentally sensitive planning techniques will produce environmental benefits, but what may be surprising is they can also produce economic benefits. The total cost to build this development was about 20% less using the open space design as opposed to the conventional design. Less road paving, as well as shorter sidewalks, water lines, sewer lines, curbs and gutters contributed to the savings.

An example from Davis, California reflects similar results. The Village Homes development, consisting of 22 houses and 40 apartments, employed narrow streets, plus graded land, channels and ponds to encourage on-site rain absorption. The resulting cost savings was $700/unit less than using conventional storm water management systems. It is also important to note that the development did not flood when a 100-year level flood hit the area. In fact, the owner Judy Corbett reported that the development soaked in some runoff from surrounding

[21] Gertner J. and Kirwan, R. 2000. *Money Magazine.* "The Best Places to Live 2000." As downloaded from http://www.money.com/money/depts/real_estate/bestplaces

[22] San Diego Association of Governments. 1997. *Regional Growth Management Strategy: Water Quality Element*.

[23] Center for Watershed Protection. 2000. The Benefits of Better Site Design in Residential Subdivisions. Water Protection Techniques. 3(2): Page 641.

communities. [24] The ideas and technologies used in both of these examples have been available for many years. However, outdated development requirements, subdivision codes, zoning regulations, street standards, and drainage requirements have discouraged developers from even attempting changes in convention.

This problem can best be remedied on the municipal level. Local authorities can work to better encourage water quality sensitive planning techniques. Conditions of approval for new developments can be updated to allow for site designs which address water quality concerns. For instance, cities could decrease the width of impervious streets by allowing one way streets on alternate blocks. Providing discretion for creative thinking on site design can save developers money and help municipalities protect their local water quality. Employing such techniques also follows with SANDAG's *Regional Growth Management Strategy.* Preserving natural habitats and open spaces is one of the five basic elements the strategy recommends for addressing all growth related questions.[25]

SANDAG has also developed *The Cites/County Forecast for the San Diego Region*, which attempts to project the demands that humans are going to place on the region over the next 20 years. The report contains some startling projections. According to the article, we can expect 1 million more people and over 400,000 new homes in the area over the next two decades.[26] According to the United States Census Bureau, the estimated population for San Diego County in July 1999 was 2,820,844 people.[27] We can therefore expect a 35% increase in population in just over 20 years. Secondly, the implications of 400,000 new homes extend beyond the homes themselves to include new roads, shopping malls, business parks, parking lots, schools and all the other amenities that accompany new development. Regulations of today must anticipate and address this growth.

To help with this matter, the 2000 Permit includes a requirement for Copermittees to develop Standard Urban Storm Water Mitigation Plans (SUSMPs) for broad categories of new development and significant redevelopment. SUSMPs as developed by the Copermittees will require developers to implement post-construction best management practices (BMPs) to reduce storm water flows and the associated pollutant loads generated from the development. What this means is that runoff carrying automobile byproducts, pet droppings, trash, and lawn chemicals for instance will need to be infiltrated, filtered, or treated before it is allowed to leave all new development. The reasoning for this is simple: Since we have not been successful in protecting the beneficial uses of water quality in the

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[24] Keith, L.D. 6/5/00. Fight Brewing in Southern California Over Construction Rules Aimed at Stormwater Runoff. Fresno Bee.

[25] San Diego Association of Governments. 1999. "2020 Cities/County Forecast for the San Diego Region." *SANDAG INFO*. Page 2.

[26] San Diego Association of Governments. 1999. "2020 Cities/County Forecast for the San Diego Region." *SANDAG INFO*. Page 2.

[27] As downloaded from the United States Census Bureau website: Http://www.census.gov/population/estimates/county/co-00-1/99C_06.txt

past, increased population and development pressures will need to be addressed differently than they were in the past.

IV. PERMIT SUMMARY

HISTORICAL PERSPECTIVE ON THE DEVELOPMENT OF THE PERMIT (PERMIT SUMMARY)

The federal Clean Water Act was amended in 1987 to address urban runoff. One requirement of the amendment was that many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of urban runoff from their municipal separate storm sewer systems (MS4s). In response to the Clean Water Act amendment (and the pending federal NPDES regulations which would implement the amendment), the SDRWQCB issued an "early" municipal storm water permit, Order No. 90-42, in July 1990 to the County of San Diego, the 18 incorporated cities within the County of San Diego, and the San Diego Unified Port District (hereinafter Copermittees) for their urban runoff discharges. As the name implies, this "early" permit was issued prior to the November 1990 promulgation of the final federal storm water regulations. Although Order No. 90-42 contained the "essentials" of the 1990 regulations, the requirements were written in very broad generic and often vague terms. Broad generic terms were incorporated into the permit for the purpose of providing the maximum amount of flexibility to the Copermittees in implementing the new requirements (flexibility was, in fact, the stated reason for issuing the permit in advance of the final regulations). From staff's perspective however, this same lack of specificity, combined with the lack of funding and political will, also provided the Copermittees with ample reasons to take few substantive steps towards permit compliance. The situation was exacerbated by the SDRWQCB's own lack of storm water resources and the general sense that the infant program was a considerably lower priority than its existing and competing core regulatory programs. In staff's assessment, the result was a general lack of action by the Copermittees and a general lack of corresponding reaction (enforcement) by the SDRWQCB during the early years of the storm water program.

When viewed relative to the early years, substantial progress towards compliance has been made by many of the Copermittees and improvements in the SDRWQCB's oversight have occurred as well. But when viewed relative to the magnitude of the problem, we've collectively progressed little in ten years and enormous challenges remain. Today, urban runoff is the leading cause of water quality impairment in the San Diego Region. One has only to look as far as the now too familiar "health advisory or beach closure" signs to see the troubling local consequences of urban runoff.

Although administratively extended pursuant to federal law, Order No. 90-42 was due for renewal in July 1995. Two previous formal drafts of the renewal permit were released to the public (in 1995 and 1998 respectively) and substantial written public comments on the drafts were considered by the SDRWQCB. In addition, a

working group of Copermittees and stakeholders was convened by the SDRWQCB in 1997 and 1998 to advise the SDRWQCB on renewal permit issues, many of which were and currently remain controversial in nature. Despite the efforts by the public, the stakeholder group, and SDRWQCB, and in part due to the concurrent issuance and appeal of three other municipal storm water permits, Order No. 90-42 was not reissued by the SDRWQCB.

MUNICIPAL STORM WATER NPDES PERMITS OVERVIEW (PERMIT SUMMARY)

Municipal storm water NPDES permits seek to ensure that the beneficial uses of a receiving water are protected despite discharges from MS4s into that receiving water. Beneficial uses are defined as the uses of water necessary for the survival or well being of man, plants, and wildlife. Municipal storm water NPDES permits contain requirements to achieve numeric and narrative receiving water quality objectives which are established to protect these beneficial uses. Water quality objectives are defined as constituent concentrations, levels, or narrative statements, representing a quality of water that supports the most sensitive beneficial uses which have been designated for a water body. At this time, municipal storm water NPDES permits contain water quality objectives and a prohibition that MS4 discharges may not cause the water quality objectives in the receiving water to be exceeded. By definition, when the water quality objectives of a receiving water are exceeded, the beneficial uses of that water are not adequately protected.

Typical NPDES permits are based on the concept of employing full-scale treatment of an effluent to remove pollutants at the end of the pipe (i.e., just before being discharged into receiving waters). Accordingly, typical NPDES permits contain numeric effluent limits which are arithmetically derived from receiving water quality objectives for each pollutant of concern in the effluent. However, municipal storm water permits are not typical NPDES permits because they are not based on the concept of full-scale treatment of polluted storm water. Full scale end of pipe treatment for storm water is not considered economically and technologically feasible at this time. Therefore municipal storm water permits do not contain numeric effluent limits, but rather are based on the concept that pollutants can be effectively reduced in storm water to the maximum extent practicable by the application of a wide range of best management practices (BMPs). The technology-based performance standard of "maximum extent practicable" refers to evaluation and implementation of BMPs to the maximum extent practicable, except where (1) other effective BMPs will achieve greater or substantially similar pollution benefits; (2) the BMP is not technically feasible; or (3) the cost of BMP implementation greatly outweighs the pollution control benefits.

In other words, in municipal storm water permits, receiving water quality objectives are attained by way of BMP implementation, including use of pollution prevention, source control, and treatment control BMPs. To protect receiving water beneficial uses, municipal storm water permits require the use of best management practices which prevent the generation of pollutants and keep runoff from coming into

contact with pollutants, to be supplemented by the use of methods that remove or treat pollutants.

COPERMITTEE RESPONSIBILITY BASED ON LAND USE AUTHORITY (PERMIT SUMMARY)

Storm water permits are issued to municipalities because of their land use authority. The ultimate responsibility for the pollutant discharges, increased runoff, and inevitable long-term water quality degradation that results from urbanization lies with local governments. This responsibility is based on the fact that it is the local governments that have authorized the urbanization (i.e., conversion of natural pervious ground cover to impervious urban surfaces) and the land uses that generate the pollutants and runoff. Furthermore, the MS4 through which the pollutants and increased flows are conveyed, and ultimately discharged into San Diego's natural receiving waters, are owned and operated by the same local governments. In summary, the municipal Copermittees under Order No. 2001-01 are responsible for discharges into and out of their storm water conveyance systems because (1) they own and operate the MS4; and (2) they have the legal authority that authorizes the very development and land uses which generate the pollutants and increased flows in the first place.

Order No. 2001-01 holds the local government accountable for this direct link between its land use decisions and water quality degradation. The permit recognizes that each of the three major stages in the urbanization process (development planning, construction, and the use or operational stage) are controlled by and must be authorized by the local government. Accordingly, this permit requires the local government to implement, or require others to implement, appropriate best management practices to reduce pollutant discharges and increased flow during each of the three stages of urbanization.

For example, since grading cannot commence prior to the issuance of a local grading permit, the Copermittees have a built-in mechanism to ensure that all grading activities are protective of receiving water quality. The Copermittee has the authority and discretion to withhold issuance of the grading permit until the project proponent has demonstrated to the satisfaction of the Copermittee that the project will not violate the Copermittee's ordinances or cause the Copermittee to be in violation of its municipal storm water permit. Since the Copermittee will ultimately be held responsible for any discharges from the grading project by the SDRWQCB, the Copermittee will want to use its own permitting authority to ensure that whatever measures the Copermittee deems necessary to protect discharges into its MS4 are in fact taken by the project proponent.

ORDER NO. 2001-01 OVERVIEW (PERMIT SUMMARY)

Order No. 2001-01 is the proposed re-issuance of Order No. 90-42 (i.e., the renewal municipal storm water permit for the Copermittees within the County of San Diego). Order No. 2001-01 incorporates not only the SDRWQCB's responses to all

oral and written comments on previous drafts received to date; it also reflects two highly controversial precedent setting decisions by the State Water Resources Control Board (SWRCB). Specifically, Order No. 2001-01 includes: (1) explicit language requiring municipal storm water dischargers to meet numeric water quality standards[28] (in addition to meeting the Maximum Extent Practicable or MEP technology based-standard); and (2) numeric sizing criteria (i.e., design

28 The issue of whether municipal storm water dischargers must meet water quality standards has been intensely debated for the past five years in California and throughout the nation. During that same five-year period, and in between sporadic work on the municipal storm water permit for San Diego County Copermittees, the SDRWQCB developed and adopted three other municipal storm water permits. As a consequence of the ongoing debate, each of the three permits was immediately appealed (primarily) on the basis of the water quality standards language. SDRWQCB Order No. 96-03, the municipal storm water permit for Orange County Copermittees was adopted and appealed in 1996. SDRWQCB Order No. 97-08, the municipal storm water permit for CALTRANS was adopted and appealed in 1997. SDRWQCB Order No. 98-02, the municipal storm water permit for Riverside County Copermittees was adopted and appealed in 1998.

In response to the appeal of the SDRWQCB's permit for Orange County, the SWRCB issued Order WQ 98-01 prescribing specific precedent-setting water quality standards language to be included in all future California MS4 permits. In essence, the SWRCB's precedent-setting language made very clear that storm water discharges must attain receiving water quality standards. In addition, unlike previously adopted versions of the language, it did not state that "violations of water quality standards are not violations of the municipal storm water permit under certain conditions." Likewise, the order's language did not indicate that the "implementation of best management practices is the 'functional equivalent' of meeting water quality standards."

In response to the appeal of the SDRWQCB's permit for Riverside County and the formal objection of the permit by the USEPA, the SWRCB issued Order WQ 99-05, modifying its own precedent-setting language (as specified in Order WQ 98-01) to meet the specific objections of the USEPA. SWRCB Order WQ 99-05 specified even more stringent requirements for municipal dischargers to meet water quality standards. In response to USEPA's formal objections to SDRWQCB Order No. 98-02, the USEPA assumed responsibility for the Riverside County permit and subsequently issued its own MS4 permit with water quality standards language for Riverside County in 1999. Upon issuance of its own permit, the USEPA returned full responsibility for the NPDES permit back to the SDRWQCB. (Riverside County Copermittees are currently subject to both SDRWQCB Order No. 98-02 as state waste discharge requirements and to the USEPA-issued NPDES permit No. CAS108766 for which the SDRWQCB has resumed full responsibility. In November 2000, the SDRWQCB plans to amend its Order No. 98-02 to replace the existing language with the full text of the USEPA-issued NPDES permit. At that time, SDRWQCB Order No. 98-02 will officially resume function as both state waste discharge requirements and a federal NPDES permit.)

Also following USEPA's issuance of its own MS4 permit for Riverside Copermittees (but in response to a separate similar USEPA-issued MS4 permit), the United States Court of Appeals for the Ninth Circuit (Defenders of Wildlife v. Browner, 1999, 197 F. 3d 1035), upheld USEPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of USEPA's discretion rather than on the basis of strict compliance with the Clean Water Act.

On October 14, 1999, the SWRCB issued what is currently its "final" legal opinion on the matter. In summary, the 1999 SWRCB opinion concluded that RWQCBs should continue to include the water quality standards language established in SWRCB Order WQ 99-05 in all future MS4 permits issued in California.

standards) for structural post-construction best management practices (BMPs) for new development and significant redevelopment.

While the requirements of Order No. 2001-01 are markedly more clear and specific than those of Order No. 90-42, they are based on the same 1990 federal storm water regulations. Where Order No. 90-42 and Order No. 2001-01 differ, Order No. 2000-01 is more specific as to what is necessary for Copermittee compliance. The increased specificity of Order No. 2001-01's requirements is necessary to address specific local urban runoff concerns, promote the attainment of water quality standards, and satisfy the Copermittee's repeated request for the SDRWQCB to identify the minimum effort required for compliance with the permit. Where requirements are more stringent than the federal storm water regulations, they are generally based on specific guidance from the USEPA and/or the SWRCB and are authorized under both the Clean Water Act section 402(p)(3)(iii) as well as the California Water Code section 13377. Furthermore, the requirements contained in Order No. 2001-01 represent the SDRWQCB's interpretation of the requisite maximum extent practicable (MEP) technology-based standard.

Order No. 2001-01 places the responsibility for urban runoff discharges into and from MS4s on the Copermittees which own and operate the systems. This responsibility is based on the Copermittees' land use authority. Since the Copermittees permit, authorize, and profit from urban development within their jurisdictions, Order No. 2001-01 holds the Copermittees responsible for the short and long-term water quality consequences of their land use decisions. Furthermore because water quality degradation is the direct result of the urbanization process, Copermittees must implement (or require others to implement) controls to reduce the flow and pollutants generated from each of the three major phases of urbanization that they authorize; namely the (1) land use planning, (2) construction; and (3) use or existing development phase.

The principal requirements of Order No. 2001-01 include the following: (1) each Copermittee shall prohibit non-storm water discharges to its MS4; (2) each Copermittee shall reduce pollutants in urban runoff discharges into and from its MS4 to the maximum extent practicable, (MEP); (3) each Copermittee shall ensure that urban runoff discharges into and from its MS4 do not cause or contribute to an exceedance of receiving water quality objectives; (4) each Copermittee shall actively seek and eliminate all sources of illicit discharges to its MS4; and (5) each Copermittee shall obtain, maintain, and enforce adequate legal authority (such as local ordinances and permits) to comply with all provisions of the order.

Two Levels of Copermittee Responsibility

Each Copermittee must carry out the requirements of Order No. 2001-01 across two broad levels of responsibility. Copermittees have responsibility for the water quality impacts of urbanization within (1) their jurisdiction and (2) their watershed. The jurisdictional responsibility of each Copermittee stems from Copermittee land use

authority within its jurisdiction. As discussed above, the Copermittee has authority over the three stages of development (planning, construction, and use or operation) within its jurisdiction. Each Copermittee must therefore take responsibility for water quality impacts resulting from their jurisdictional land use decisions.

Watershed responsibility is also necessary from each Copermittee. This is because each Copermittee is located somewhere within a watershed it shares with other Copermittees. Urban runoff generated in various Copermittee jurisdictions does not follow jurisdictional boundaries, but rather travels through many jurisdictions while flowing towards receiving waters. Simplistically, a watershed can be thought of as a common pipe to the ocean, along the length of which reside the Copermittees within the watershed. Inland Copermittees can be thought of as upstream contributors of pollutants and flow to the common pipe; while coastal Copermittees can be considered downstream contributors. Collectively the Copermittees within the watershed each contribute to the cumulative pollutant load that is conveyed in urban runoff by their interconnected MS4 systems to the receiving waters. Therefore, each Copermittee has shared responsibility for the impacts of its urbanization on the watershed in which it is located. Both coastal and inland cities contribute to receiving water quality problems and both must accept responsibility for contributing to the solution.

Order No. 2001-01 reflects these two broad levels of responsibility, in that it requires implementation of comprehensive urban runoff management plans on both a jurisdictional and watershed level.

Permit Requirements

Order No. 2001-01 contains the following principal elements:

- Legal Authority – Each Copermittee shall establish and maintain adequate legal authority to control pollutant discharges into and from its MS4.
- Jurisdictional Urban Runoff Management Program – Each Copermittee shall develop and implement a Jurisdictional Urban Runoff Management Program which will reduce discharges of pollutants and runoff flow during each major phase of urban development (i.e., planning, construction, and use or operation phases) within its jurisdiction.
- Watershed Urban Runoff Management Program – Each Copermittee shall collaborate with other Copermittees within its watershed(s) to develop and implement a Watershed Urban Runoff Management Program which will identify and address the highest priority water quality issues/pollutants in their respective watershed(s).
- All Copermittee Collaboration – Each Copermittee shall collaborate with all other Copermittees to address common issues, promote consistency, and plan and coordinate urban runoff activities.
- Monitoring – The Copermittees shall develop and implement a Receiving Waters Monitoring Program which shall focus on the collection of monitoring

data to be used for the achievement of water quality objectives and the protection of beneficial uses.

- Reporting – Each Copermittee shall submit various reports describing the measures it is undertaking to meet the requirements of Order No. 2001-01.

Each of these principal elements of Order No. 2001-01 is discussed in greater detail below.

Legal Authority

Each Copermittee must adopt and enforce whatever legal authority is needed to eliminate or reduce pollutant discharges from all urban land use sources into and out of its MS4. This legal authority must include the ability to prohibit all discharges into the MS4 except for those which originate from precipitation (and a few other minor exceptions). Each Copermittee must also have legal authority to conduct inspections, collect samples, and require businesses to implement BMPs. Legal authority can be developed through ordinance, permit, contract, or similar means. Each Copermittee must ensure that its requirements are being complied with and use its legal authority to take enforcement actions against violators which are not meeting the Copermittee's requirements.

Jurisdictional Urban Runoff Management Program

The focus of the Jurisdictional Urban Runoff Management Program (URMP) is to address urban runoff during each phase of urbanization (i.e., planning, construction, and use or operation phases). The Jurisdictional URMP includes specific requirements for each of these phases of urbanization, as well as broad requirements which apply to all of the phases.

The Jurisdictional URMP singles out the planning phase of urbanization since addressing urban runoff during the planning phase of development is an effective means (in terms of both cost and performance) for protecting receiving water quality. The planning stage provides the greatest number and variety of opportunities for addressing runoff, as well as the most cost effective time for implementation of BMPs. Order No. 2001-01 includes the following requirements for addressing urban runoff during the planning phase of new development:

- Each Copermittee shall incorporate water quality protection principles and policies into its General Plan or equivalent plan to guide land use decisions.
- Each Copermittee shall modify its development project approval processes to ensure water quality concerns are addressed by development projects. This requirement includes development and implementation by each Copermittee of water quality conditions of approval for projects. Each Copermittee shall also develop and implement Standard Urban Storm Water Mitigation Plans (SUSMPs), requiring various categories of development to implement post-construction BMPs meeting specific numeric sizing criteria.

- Each Copermittee shall revise its environmental review process, including California Environmental Quality Act (CEQA) checklists, to include requirements for evaluation of water quality effects from development projects.
- Each Copermittee shall conduct education efforts for its planning and development review staffs, as well as the development community at large.

The construction phase of urbanization is also singled out in the Jurisdictional URMP requirements of Order No. 2001-01. Construction sites and practices are given a high priority in the Jurisdictional URMP requirements due to their significant potential for erosion and discharge of pollutants to MS4s and receiving waters. Order No. 2001-01 includes the following requirements for addressing urban runoff during the construction phase of urbanization:

- Each Copermittee shall implement, or require implementation of, pollution prevention measures at construction sites.
- Each Copermittee shall update its grading ordinance to require grading and construction activities to include pollution prevention, source control, and structural treatment BMPs.
- Each Copermittee shall update its construction and grading approval processes to ensure water quality concerns are addressed by construction/grading projects. This requirement includes development and implementation by each Copermittee of water quality conditions of approval for construction and grading projects.
- Each Copermittee shall maintain an inventory of all construction sites within its jurisdiction.
- Each Copermittee shall establish priorities for construction oversight activities.
- Each Copermittee shall implement, or require implementation of, minimum BMPs at construction sites. The level of BMPs to be implemented shall be bases on the priority level of the site.
- Each Copermittee shall conduct inspections of construction sites based on construction site priority level.
- Each Copermittee shall enforce its ordinances at all construction sites.
- Each Copermittee shall report non-compliant construction sites to the SDRWQCB.
- Each Copermittee shall conduct education efforts for its construction, building, and grading review staffs, as well as the construction community at large.

The Jurisdictional URMP contains extensive requirements for existing development as well. All urban land uses are addressed by the requirements. The specific land uses identified in the Jurisdictional URMP are municipal, industrial, commercial, and residential land uses. In general, the structure of the Jurisdictional URMP requirements for each of these land uses are similar. For each of the existing development land uses, the Jurisdictional URMP requirements include:

- Each Copermittee shall implement, or require implementation of, pollution prevention measures for each land use.
- Each Copermittee shall maintain an inventory of sites for the various land uses within its jurisdiction. The types of sites to be inventoried for each land use are detailed in section VII. of this fact sheet as well as the permit.
- Each Copermittee shall establish priorities for oversight activities of sites for each land use. The types of sites to be prioritized for each land use are detailed in section VII. of this fact sheet as well as the permit .
- Each Copermittee shall implement, or require implementation of, minimum BMPs at sites for each land use, based on the sites' designated priority levels.
- Each Copermittee shall conduct inspections of sites for each land use based on the sites' designated priority levels.
- Each Copermittee shall enforce its ordinances at all sites for all land uses.

In addition to the general requirements listed above for each land use, the Jurisdictional URMP also contains specific requirements for each land use. These requirements are detailed section VII. of this fact sheet as well as the permit.

While the specific Jurisdictional URMP requirements for each of the three phases of urbanization (i.e., planning, construction, and use or operational phase) are detailed above, the Jurisdictional URMP also contains requirements which apply to all of the phases of urbanization. These include:

- Education – Each Copermittee shall implement an education program using various types of media to (1) increase the knowledge of target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions; and (2) change the behavior of target communities and thereby reduce pollutant releases to the MS4 and receiving waters.
- Illicit Discharge Detection and Elimination – Each Copermittee shall develop and implement measures to detect and eliminate all illicit discharges. This includes measures to respond to sewage and other spills, limit infiltration from sanitary sewers, and facilitate proper disposal and encourage reporting by the public.
- Public Participation – Each Copermittee shall incorporate a mechanism for public participation in the implementation of the Jurisdictional URMP.
- Assessment of Effectiveness – Each Copermittee shall develop a long-term strategy for assessing the effectiveness of its urban runoff management program.
- Fiscal Analysis – Each Copermittee conduct annual fiscal analyses to exhibit adequate fiscal resources necessary to meet the requirements of Order No. 2001-01.

Watershed Urban Runoff Management Program

As discussed above, each Copermittee has responsibility for the impacts of its urban runoff on its respective watershed(s). This is because urban runoff does not follow jurisdictional boundaries, and often travels through many jurisdictions while flowing

to receiving waters. Therefore, the actions of various municipalities within a watershed regarding urban runoff can have a cumulative impact upon shared receiving waters. For this reason, Order No. 2001-01 requires each Copermittee to develop and implement a Watershed URMP. The Watershed URMPs are to be developed later in the permit cycle. Copermittees within each watershed shall collaborate to develop and implement a Watershed URMP for the watershed. The purpose of the Watershed URMPs is to identify and address the highest priority water quality issues/pollutants in each watershed. Under the Watershed URMP requirements, the Copermittees of a watershed shall:

- Map the watershed and identify all receiving waters, all impaired receiving waters, land uses, highways, jurisdictional boundaries, and inventoried commercial, industrial, construction, municipal sites, and residential areas.
- Assess the water quality of all receiving waters in the watershed based on existing data, and eventually perform watershed based water quality monitoring.
- Identify and prioritize major water quality problems in the watershed caused or contributed to by discharges from MS4s, including potential sources of the problems.
- Develop and implement a time schedule of activities needed to address the highest priority water quality problems.
- Identify which Copermittee is responsible for implementing each recommended watershed activity.
- Develop and implement a mechanism for public participation in watershed activities.
- Develop and implement a watershed based education program.
- Develop a strategy for assessing the effectiveness of the Watershed URMP.

All Copermittee Collaboration

The Copermittees shall implement a collective management structure to allow individual Copermittees to carry out permit requirements with other Copermittees, either as a whole (all of the Copermittees countywide) or within a watershed (Copermittees within a watershed). This Order No. 2001-01 requirement provides for more effective urban runoff management, in that it allows for various Copermittee roles to be defined and aids in the sharing of costs to meet permit requirements.

Monitoring

Order No. 2001-01 requires a comprehensive monitoring program for urban runoff impacts to receiving waters. The monitoring program will help prioritize efforts so that limited resources will be most effective in improving receiving water quality. It will also aid in assessing the effectiveness of urban runoff management efforts. The Copermittees are to develop the monitoring program; however, the SDRWQCB has outlined several aspects to be included in the program. These aspects include:

- Development of a Previous Monitoring and Future Recommendations Report which summarizes all previous wet weather monitoring results and recommends future monitoring activities.
- Development and implementation of a urban stream bioassessment monitoring program, which shall consist of station identification, sampling, monitoring, and analysis of bioassessment stations to determine the biological and physical integrity of urban streams within the County of San Diego.
- Monitoring of existing mass loading stations for the purposes of evaluating long-term trends.
- Development and implementation of a monitoring program for discharges of urban runoff from coastal storm drain outfalls.
- Development and implementation of a monitoring program to assess the impact of urban runoff on ambient receiving water quality.
- Development and implementation of a monitoring program to assess the impact of urban runoff on Toxic Hot Spots in San Diego Bay.

Reporting

Under Order No. 2001-01, each Copermittee must submit a series of documents and reports. The following is a brief description of the primary reports required by Order No. 2001-01. When each Copermittee has developed its Jurisdictional Urban Runoff Management Programs and Watershed Urban Runoff Management Programs (by dates specified in the permit), it must submit documents describing the programs. Each Copermittee must also annually submit Jurisdictional URMP Annual Reports and Watershed URMP Annual Reports once the programs have been implemented. An annual monitoring report for the Copermittees must also be submitted. There are other documents and reports required for submittal; these documents and reports are detailed in section VII. of this fact sheet and in Order No. 2001-01.

CONCLUSION (PERMIT SUMMARY)

Order No. 2001-01 is an essential mechanism for maintaining and improving water quality in San Diego County. Since the inception of the NPDES Storm Water Program, some advancements have been made in the San Diego region to control urban runoff pollution. This includes a better understanding by local managers of the regulations, the Think Blue public education campaign, and improved Copermittee group communication. However, continued improvement in urban runoff quality is still necessary to achieve sound protection of beneficial uses of the region's receiving waters.

V. COMMON MUNICIPAL STORM WATER PERMIT ISSUES

Interested parties have frequently brought the following issues listed below to the attention of the SDRWQCB. During issuance of previous draft versions of this municipal storm water permit, most comments from interested parties have

revolved around these issues. For this reason, the SDRWQCB has included its responses to the following issues in order to clarify its position regarding the issues.

1. Issue: Is the SDRWQCB required to meet California Environmental Quality Act (CEQA) requirements prior to adoption of the tentative Municipal Storm Water Permit for San Diego County and Cities (tentative permit)?

> **Response:** No. The adoption and issuance of the tentative permit itself, and the requirements contained in the tentative permit, are exempt from CEQA under California Water Code section 13389. California Water Code section 13389 exempts the adoption of waste discharge requirements (such as NPDES permits) from CEQA requirements.

2. Issue: Do the requirements of the tentative permit constitute an "unfunded mandate"?

> **Response:** No. The requirements of the tentative permit are not within the definition of "unfunded mandate" that would require reimbursement of costs under the California Constitution. This is because the requirements of the tentative permit are derived from the federal Clean Water Act, as opposed to State Law. Since the order would implement a federal requirement, rather than a state requirement, the order is not an "unfunded mandate" by the state. The State Water Resources Control Board (SWRCB) has previously determined in several circumstances that regional board orders are exempt from the requirement for reimbursement under the California Constitution.

3. Issue: Does the SDRWQCB have the legal authority to require municipalities to regulate urban runoff flow to protect beneficial uses of receiving waters?

> **Response:** Yes. Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality." The term "water quality standards" in this context refers to a water body's **beneficial uses** and the water quality objectives necessary to protect those beneficial uses. The negative impact of urban runoff flow on the beneficial uses of receiving waters has been widely documented. Increases in flows from impervious surfaces associated with urbanization can result in (1) increases in the number of bankfull events and increased peak flow rates; (2) sedimentation and increased sediment transport; (3) frequent flooding; (4) stream bed scouring and habitat degradation; (5) shoreline erosion and stream bank widening; (6) decreased baseflow; (7) loss of fish populations and loss of sensitive aquatic species; (8) aesthetic degradation; and (9) changes in stream morphology.[29] US EPA finds that the level of imperviousness

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

resulting from urbanization is strongly correlated with the water quality impairment of nearby receiving waters.[30] US EPA further attributes much of this water quality impairment to changes in flow conditions from urbanization, stating "[I]n many cases, the impacts on receiving streams due to high storm water flow rates or volumes can be more significant than those attributable to the contaminants found in storm water discharges."[31] Therefore, in order to protect the beneficial uses and water quality objectives of waters receiving urban runoff flows (as **required** by 40 CFR 122.44(d)(1)), the SDRWQCB has under certain circumstances placed limits on urban runoff flows in the tentative permit.

In addition, the authority of states to regulate flow in order to protect water quality standards has been addressed by the U.S. Supreme Court in PUD No. 1 v. Washington Department of Ecology, 511 U.S. 700 (1994). In this case the U.S. Supreme Court found that the Clean Water Act applies to water quantity as well as water quality, stating "[p]etitioners also assert more generally that the Clean Water Act is only concerned with water 'quality' and does not allow the regulation of water 'quantity.' This is an artificial distinction. In many cases, water quantity is closely related to water quality." The U.S. Supreme court goes on to refer to the Clean Water Act's definition of pollution ("the man-made or man induced alteration of the chemical, physical, biological, and radiological integrity of water" 33 U.S.C. 1362(19)) and states "[t]his broad conception of pollution – one which expressly evinces Congress' concern with the physical and biological integrity of water – refutes petitioners' assertion that the Act draws a sharp distinction between the regulation of water 'quantity' and water 'quality'." In this context, the U.S. Supreme Court held that the state's regulation of flow was "a limitation necessary to enforce the designated use of the River as a fish habitat." Finally, it was held that the state's regulation of flow was "a proper application of the state and federal antidegradation regulations, as it ensures than an 'existing instream water use' will be 'maintained and protected.' 40 CFR 131.12(a)(1) (1992)."

4. Issue: Can the SDRWQCB include in the tentative permit more specific requirements than those stated in the federal NPDES regulations?

Response: Yes. In both a general sense, as well as specifically relating to municipal storm water, the Clean Water Act explicitly preserves independent state authority to enact and implement its own standards and requirements, provided that such standards and requirements are at least as stringent as those that would be mandated by the Clean Water Act and the federal regulations. For example, as one general overriding principle,

[30] U.S. Environmental Protection Agency. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. p. 68727.

[31] U.S. Environmental Protection Agency. 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA-821-R-99-012. p. 4-23.

Clean Water Act section 510 states "nothing in this chapter shall (1) preclude or deny the right of any State or political subdivision thereof or interstate agency to adopt or enforce (A) any standard or limitation respecting discharges of pollutants, or (B) any requirement respecting control or abatement of pollution […]." When relating specifically to storm water, Clean Water Act section 402(p)(3)(B)(iii) clearly provides states with wide-ranging discretion, stating that municipal storm water permits "[s]hall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, **and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants**" (emphasis added).

Therefore, where the tentative permit contains requirements more specific than those included in the federal NPDES regulations 40 CFR 122.26(d), it is seeking to meet the above Clean Water Act requirements, as well as other particular federal NPDES regulations such as 40 CFR 122.44(d)(1)(i). This federal NPDES regulation requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." Given the continued impact of urban runoff on receiving waters within the San Diego region, increased specificity in municipal storm water permits is necessary to meet the above CWA and federal regulation requirements.

In a 1992 decision, the U.S. Court of Appeals for the Ninth Circuit (NRDC v. US EPA, 966 F.2d 1292) interpreted the language in Clean Water Act section 402(p)(3)(B)(iii) as providing the State with substantial discretion and authority: "[t]he language in (iii), above, requires the Administrator or the State to design controls. Congress did not mandate a minimum standards approach or specify that U.S. EPA develop minimal performance requirements […] we must defer to U.S. EPA on matters such as this, where U.S. EPA has supplied a reasoned explanation of its choices." The decision in essence holds that the U.S. EPA and the States are authorized to require implementation of storm water control programs that, upon "reasoned explanation," accomplish the goals of CWA section 402(p). The Ninth Circuit Court of Appeals further reinforced the State's authority in this area more recently in 1999. In Defenders of Wildlife v. Browner (1999) Case No. 98-71080, the Court cited the language of CWA section 402(p)(3)(B)(iii) and stated "[t]hat provision gives the U.S. EPA discretion to determine what pollution controls are appropriate. As this court stated in NRDC v. U.S. EPA, 'Congress gave the administrator discretion to determine what controls are necessary […].'"

Furthermore, the increased specificity included in the tentative permit is in line with US EPA guidance included in its *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems*[32] and its *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*.[33] Where the tentative permit is more specific than the federal regulations, it is frequently based on the recommendations of the Guidance Manual. The Interim Permitting Approach also supports increased specificity in storm water permits, recommending that municipal storm water permits use "best management practices (BMPs) in first-round storm water permits, and **expanded or better-tailored BMPs in subsequent permits**, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate" (emphasis added). It is important to note that the SWRCB cited US EPA's Interim Permitting Approach as support for its recent tentative decision which upheld the increased specificity of numeric sizing criteria requirements for post-construction BMPs as appropriate requirements in municipal storm water permits.

Finally, the Copermittees have frequently requested clarification from the SDRWQCB on what is necessary to achieve compliance with the current Municipal Storm Water Permit for San Diego County and Cities (Order No. 90-42). The tentative permit responds to this request by describing the minimum permit requirements in detail.

5. Issue: Does the tentative permit dictate the design and manner of compliance in which the Copermittees are to comply with its requirements, in violation of California Water Code section 13360?

Response: No. CWA section 402(p)(3)(B)(iii) provides that municipal storm water permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." To meet this requirement of the CWA, the tentative permit requires the implementation of BMPs, as required under Federal NPDES regulation 40 CFR 122.44(k). While the tentative permit includes requirements for widespread BMP implementation, it does not require use of any particular BMPs. The tentative permit actually encourages implementation of combinations of BMPs, and further does not

[32] U.S. Environmental Protection Agency. 1992. Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

[33] U.S. Environmental Protection Agency. 1996. Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. 61 FR 43761.

preclude any particular BMPs or other means of compliance. A permit which allows for seemingly infinite means for achieving compliance does not 'specify the design or manner of compliance' in violation of California Water Code section 13360.

The specified programs included in the tentative permit must be implemented by the Copermittees in order to carry out the CWA requirements. Any specified programs in the tentative permit are made all the more necessary by the exclusion of numerical effluent limits from the permit. Reliance on BMPs as opposed to numerical effluent limits requires specification of those programs that are relied upon to reduce pollution.

Finally, the SWRCB's recent tentative decision on the appeal of the Los Angeles Regional Water Quality Control Board's (LARWQCB's) action on SUSMPs and numeric sizing criteria appears to support inclusion of detail in municipal storm water permits on the level which is found in the tentative permit. The SWRCB tentatively found that the numeric sizing criteria requirement for post-construction BMPs did not violate California Water Code section 13360. Provided that the numeric sizing criteria requirement is most likely the most specific requirement in the tentative permit, the SWRCB tentative decision in support of numeric sizing criteria indicates its general approval of the level of detail found in the tentative permit.

6. Issue: Do discharges from municipal separate storm sewer systems (MS4s) need to meet the water quality standards (beneficial uses and water quality objectives) of the receiving waters to which they discharge?

Response: Yes. The issue of whether storm water discharges from MS4s must meet water quality standards has been intensely debated for the past five years. The argument arises because Clean Water Act section 402(p) fails to clearly state that municipal dischargers of storm water must meet water quality standards. On the issue of industrial discharges of storm water, the statute clearly indicates that industrial dischargers must meet both (1) the technology-based standard of "best available technology economically achievable (BAT)" and (2) applicable water quality standards. On the issue of municipal discharges however, the statute states that municipal dischargers must meet (1) the technology-based standard of "maximum extent practicable (MEP)" and (2) "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants." The statute fails, however, to specifically state that municipal dischargers must meet water quality standards.

As a result, the municipal storm water dischargers have argued that they do not have to meet water quality standards; and that they only are required to meet the MEP standard. Environmental interest groups maintain that not only do MS4 discharges have to meet water quality standards, but that MS4 permits must also comply with numeric effluent limitations for the purpose

of meeting water quality standards. On the issue of water quality standards, the US EPA, the SWRCB, and the SDRWQCB have consistently maintained that MS4s must indeed comply with water quality standards. On the issue of whether water quality standards must be met by numeric effluent limits, the US EPA, the SWRCB (in Orders WQ 91-03 and WQ 91-04), and the SDRWQCB have maintained that MS4 permits can, at this time, contain narrative requirements for the implementation of BMPs in place of numeric effluent limits.

SWRCB rationale: In addition to relying on US EPA's legal opinion concluding that MS4s must meet MEP and water quality standards, the SWRCB also relied on the Clean Water Act's explicit authority for States to require "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants" in addition to the technology-based standard of MEP. To further support its conclusions that MS4 permit dischargers must meet water quality standards, the SWRCB relied on provisions of the California Water Code that specify that all waste discharge requirements must implement applicable Basin Plans and take into consideration the appropriate water quality objectives for the protection of beneficial uses.

The SWRCB first formally concluded that permits for MS4s must contain effluent limitations based on water quality standards in its Order WQ 91-03. In that Order, the SWRCB also concluded that it was appropriate for Regional Boards to achieve this result by requiring best management practices, rather than by inserting numeric effluent limitations into MS4 permits. In Order WQ 98-01, the SWRCB prescribed specific precedent setting Receiving Water Limitations language to be included in all future MS4 permits. This language specifically requires that MS4 dischargers meet water quality standards and allows for the use of narrative BMPs (increasing in stringency and implemented in an iterative process) as the mechanism by which water quality standards can be met.

In Order WQ 99-05, the SWRCB modified its receiving water limitations language found in Order WQ 98-01 to meet specific objections by the US EPA (the modifications resulted in stricter compliance with water quality standards). SWRCB Order WQ 99-05 states "In Order WQ 98-01, the State Water Resources Control Board (State Water Board) ordered that certain receiving water limitation language be included in future municipal storm water permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Regional Water Quality Control Boards (Regional Water Boards) for Vallejo and Riverside respectively, the United States Environmental Protection Agency (EPA) objected to the permits. The EPA objection was based on the receiving water limitation language. The EPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.

"In light of EPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the State Water Board is revising its instructions regarding receiving water limitation language for municipal storm water permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the EPA language. Based on the reasons stated here, and as a precedent decision, the following receiving water limitation language [which is found in Receiving Water Limitations item C. of Order No. 2001-01] shall be included in future municipal storm water permits."

In a late 1999 case involving MS4 permits issued by US EPA to several Arizona cities (Defenders of Wildlife v. Browner, 1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit upheld US EPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of US EPA's discretion rather than on the basis of strict compliance with the Clean Water Act. In other words, while holding that the Clean Water Act does not require all MS4 discharges to comply strictly with state water quality standards, the Court also held that US EPA has the authority to determine that ensuring strict compliance with state water quality standards is necessary to control pollutants. On the question of whether MS4 permits must contain numeric effluent limitations, the court upheld US EPA's use of iterative BMPs in place of numeric effluent limits.

SWRCB's final position: On October 14, 1999, the SWRCB issued a legal opinion on the federal appellate decision and provided advice to the Regional Boards on how to proceed in the future. In the memorandum, the SWRCB concludes that the recent Ninth Circuit opinion upholds the discretion of US EPA and the State to (continue to) issue permits to MS4s that require compliance with water quality standards through iterative BMPs. Moreover, the memorandum states that "[…] because most MS4 discharges enter impaired water bodies, there is a real need for permits to include stringent requirements to protect those water bodies. As total maximum daily loads (TMDLs) are developed, it is likely that MS4s will have to participate in pollutant load reductions, and the MS4 permits are the most effective vehicles for those reductions." In summary, the SWRCB concludes that the Regional Boards should continue to include the Receiving Water Limitations language established in SWRCB Order WQ 99-05 in all future permits.

Accordingly, the SDRWQCB has required in the tentative permit that discharges from MS4s meet receiving water quality objectives.

7. Issue: What is the definition of "maximum extent practicable (MEP)" and who defines it?

Response: Under Section 402(p) of the Clean Water Act, municipalities are required to reduce the discharge of pollutants from their storm water

conveyance systems to the maximum extent practicable (MEP). MEP is the critical technology-based performance standard which municipalities must attain in order to comply with their municipal storm water permits. The MEP standard establishes the level of pollutant reductions the municipality must achieve. MEP generally emphasizes pollution prevention and source control BMPs (as the first line of defense) **in combination** with treatment methods serving as a backup (additional line of defense).

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. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?

If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive BMPs, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost is prohibitive, it would have met the standard. Where a choice may be made between two BMPs which should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs which would address a pollutant source, or to pick a BMP base solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented.[34]

[34] Source: February 11, 1993 memo entitled "Definition of Maximum Extent Practicable" by Elizabeth Jennings, Senior Staff Counsel, SWRCB

A definition of MEP is not provided in either the federal statute or in the federal regulations. The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. While Regional or State Boards ultimately define MEP, it is the responsibility of the Copermittees to initially propose actions that implement BMPs to reduce pollution to the MEP. In other words, the Copermittees' Jurisdictional and Watershed Urban Runoff Management Programs (URMPs) to be developed under the tentative permit are the Copermittees' proposals of MEP. Their total collective and individual activities conducted pursuant to their URMPs become their proposal for MEP as it applies both to their overall effort, as well as to specific activities.

It is the SDRWQCB's responsibility to evaluate the proposed programs and specific BMPs to determine what constitutes MEP, using the above guidance and the court's decision in NRDC v. California Department of Transportation, Federal District Court, Central District of California (1994). The court stated that a permittee must evaluate and implement BMPs except where (1) other effective BMPs will achieve greater or substantially similar pollution control benefits; (2) the BMP is not technically feasible; or (3) the cost of BMP implementation greatly outweighs the pollution control benefits. In the absence of a proposal acceptable to the SDRWQCB, the SDRWQCB will define MEP by requiring implementation of additional measures by the Copermittees.

8. Issue: Can the SDRWQCB compel municipalities to use the local authority to control activities of third parties subject to their governmental jurisdiction that could affect the quality of the waters of the state?

Response: Yes. Copermittees cannot passively receive and discharge pollutants from third parties. As US EPA states, "The operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts 'title' for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges to the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties."[35]

Discharges of pollutants to the MS4 must therefore be controlled, and an important means for a municipality to achieve this is through the development and enforcement of municipal legal authority. USEPA states "A crucial requirement of the NPDES storm water regulation is that a municipality must demonstrate that it has adequate legal authority to control the contribution of pollutants in storm water discharged to its MS4. […] In order to have an effective municipal storm water management program, a

[35] U.S. Environmental Protection Agency. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. p. 68765.

municipality must have adequate legal authority to control the contribution of pollutants to the MS4. […] 'Control,' in this context, means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4." [36]

Since discharges which enter the MS4 are generally discharged unimpeded directly into receiving waters, the Copermittee's legal authority is to apply to both discharges into and from MS4s. Federal NPDES regulations clearly provide the SDRWQCB with the legal authority to require municipalities to control discharges from third parties into their MS4. 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff **from** commercial, residential, industrial, and construction land uses or activities. Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges **to** their MS4. This concept is further supported in the Preamble to the Phase II Final Rule NPDES storm water regulations, which states "The operators of regulated small MS4s cannot passively receive and discharge pollutants **from** third parties"[37] (emphasis added). Due to the greater water quality concerns generally experienced by larger municipalities, Phase II Final Rule findings for small municipalities are also applicable to larger municipalities such as the Copermittees. Finally, underlying the Federal NPDES storm water regulations is the Clean Water Act, which states in section 402(p)(3)(B)(ii) that municipalities shall "effectively prohibit non-stormwater discharges **into** the storm sewers" (emphasis added).

The requirement for municipal storm water dischargers to have, and exercise, local governmental authority in order to comply with water quality control obligations is analogous to the requirement for Publicly Owned Treatment Works to have and exercise legal authority to require pretreatment of industrial wastes being discharged to their sewage collections systems (CWA 402(b)(8)).

9. Issue: Does the tentative permit improperly shift responsibility for control of construction and industrial sources of pollution to the Copermittees?

Response: No. US EPA felt it so important to control the discharge of pollutants from construction and industry that it established a double system of regulation over construction and industrial sites. Two parallel regulatory systems were established with the same common objective of keeping pollutants from construction and industrial sites out of the

[36] U.S. Environmental Protection Agency. 1992. Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

[37] U.S. Environmental Protection Agency. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. p. 68765.

municipal separate storm sewer system (MS4). A structure was created where local governments must enforce their local ordinances and permits as required under their municipal storm water permits, while the SDRWQCB (state) must enforce its statewide general construction and industrial storm water permits. The two regulatory systems were designed to complement and support each other in the shared goal of minimizing pollutant discharges in runoff from construction and industrial sites.

Local governments have the primary regulatory authority over the majority of construction and industrial sites since they issue the development and land use permits for the sites. In other words, the Copermittees are responsible for the water quality consequences of their planning, construction, and land use decisions. Since local governments are the lead permitting authority for construction and industrial sites, they are also the lead for enforcement of discharges from the sites, with support coming from the SDRWQCB. If it is found that a local government has made a good faith, but unsuccessful effort to achieve compliance with its ordinances and permits, the SDRWQCB will step in to assist the local government by enforcing its general statewide permit. However, it is important to note that the SDRWQCB looks first to the local government that has authorized the construction or land use to enforce compliance with its applicable ordinances and permits.

US EPA supports this approach, clearly placing responsibility for the control of discharges from construction and industrial sites with municipalities. US EPA notes in the preamble to the storm water regulations that municipalities are in the best place to enforce industrial compliance with storm water discharge requirements, stating "[b]ecause storm water from industrial facilities may be a major contributor of pollutants to MS4s, municipalities are obligated to develop controls for storm water discharges associated with industrial activity through their system in their storm water management program [...]"[38] and "[t]hese permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system."[39]

Regarding construction sites, US EPA also places enforcement responsibility on municipalities, requiring small municipalities to develop and implement "[a]n ordinance or other regulatory mechanism to require erosion and sediment controls, as well as **sanctions** to ensure compliance [...]" (40 CFR 122.34(b)(4)(ii)(A)) (emphasis added). In its guidance for the Phase II regulations, US EPA goes on to support increased municipality

[38] U.S. Environmental Protection Agency. 1990. 40 CFR Parts 122, 123, and 124 National Pollutant discharge Elimination System Permit Application Regulations for Storm Water Discharges; Final Rule. p. 48000.

[39] U.S. Environmental Protection Agency. 1990. 40 CFR Parts 122, 123, and 124 National Pollutant discharge Elimination System Permit Application Regulations for Storm Water Discharges; Final Rule. p. 48006.

responsibility, stating "Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure for the small MS4 program is needed to induce more localized site regulation and enforcement efforts, and to enable operators of regulated small MS4s to more effectively control construction site discharges into their MS4s."[40] While these above citations refer to small municipalities under Phase II of the NPDES program, US EPA recommendations to small municipalities are applicable to larger municipalities such as the Copermittees, due to the typically more serious water quality concerns attributed to such larger municipalities.

10. Issue: Must the tentative permit require that municipal storm water discharges meet numeric effluent limits?

Response: No. Although NPDES permits must contain conditions to ensure that water quality standards are met, this does not require the use of numeric effluent limitations. Under the Clean Water Act and federal NPDES regulations, permitting authorities may employ a variety of conditions and limitations in storm water permits, including best management practices, performance objectives, narrative conditions, monitoring triggers, actions levels (e.g., monitoring benchmarks, toxicity reduction evaluation action levels), etc., as the necessary effluent limitations, where numeric effluent limitations are determined to be unnecessary or infeasible.

Neither the Clean Water Act nor the federal NPDES regulations require numeric effluent limitations for municipal storm water discharges. Section 301 of the Clean Water Act requires that discharger permits include effluent limitations necessary to meet water quality standards. Section 502 defines "effluent limitations" to mean any restriction on quantities, rates, and concentrations of constituents discharged from point sources. The Clean Water Act does not say that effluent limitations need be numeric. As a result, US EPA and States have flexibility in terms of how to express effluent limitations.

US EPA has, through the federal NPDES regulations, interpreted the Clean Water Act statute to allow for non-numeric effluent limitations (e.g., best management practices) to replace numeric effluent limitations where numeric effluent limitations are infeasible (40 CFR 122.44(k)). US EPA has found numeric effluent limitations infeasible because storm water discharges are highly variable both in terms of flow and pollutant concentrations, and the relationships between discharges and water quality can be complex. The current use of system-wide permits and a variety of jurisdiction-wide BMPs, including educational and programmatic BMPs,

[40] U.S. Environmental Protection Agency. 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

does not easily lend itself to the existing methodologies for deriving numeric effluent limitations.

It should be noted that while the tentative permit does not specify numeric effluent limitations for municipal urban runoff discharges, it does not preclude numeric effluent limitations from applying to municipal urban runoff discharges into impaired water bodies. Where impaired water bodies are not meeting their water quality standards, numeric effluent limitations may be placed on municipal urban runoff discharges through the implementation of total maximum daily loads (TMDLs) or other means. Furthermore, methods utilized to calculate waste load allocations for TMDLs may eventually be used to develop numeric effluent limitations for urban runoff in municipal storm water permits.[41]

11. Issue: Does the tentative permit provide adequate time for the Copermittees to develop and implement programs to meet its requirements?

Response: Yes. The tentative permit provides the Copermittees with at least six months to develop and implement their Jurisdictional Urban Runoff Management Programs. With regards to the component of the Jurisdictional Urban Runoff Management Programs which addresses planning and new development, the Copermittees are given a full year for development and implementation. In addition, the Copermittees are allowed at least 18 months to develop and implement their individual Standard Urban Storm Water Mitigation Plans (SUSMPs) for new development. Given that the federal NPDES storm water regulations, as well as the Copermittees' current storm water permit, have been in place for approximately 10 years, the Copermittees should require little time to develop and implement Jurisdictional Urban Runoff Management Programs which meet the tentative permit requirements. The time periods provided by the tentative permit should be more than adequate.

12. Issue: Should the tentative permit allow for urban runoff from new development and significant redevelopment to be addressed by regional BMPs (i.e., end of pipe or diversion BMPs) in lieu of site-specific BMPs?

Response: No. The SDRWQCB feels that regional BMP approaches (such as end of pipe diversions) send the wrong message to dischargers and the public, which can then cause setbacks in progress which has already been made. Instead of the idea that "business as usual" is acceptable since regional BMPs will "take care of everything" downstream, the message that SUSMPs and numeric sizing criteria should send is that behavior and site design must change in order for water quality to improve. In the San Diego region, it is already difficult to convince residents and businesses in inland

[41] Source: U.S. Environmental Protection Agency. 1996. Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. 61 FR 43761.

cities that activities there will have an important impact on water quality in coastal waters such as San Diego Bay or Los Penasquitos Lagoon. Both of these water bodies are listed as Clean Water Act section 303(d) impaired water bodies due in part to urban runoff. The advent of regional end of pipe BMP approaches will make that message even more difficult to communicate. Moreover, on-site structural BMPs are important education tools. Movement of BMPs out of sight of the public reduces their educational benefits. Rather than send false messages, BMPs and their site selection should encourage environmental stewardship by the public for the watersheds in which they live and work. Consequently, nearly all of the programs required and implemented under the Phase I Municipal Storm Water NPDES permits have been focused on source reduction through modification of behaviors/practices, in combination with the use of on-site structural BMPs, rather than on regional end of pipe treatment or diversion. In fact, on-site BMP implementation (such as a combination of pollution prevention, source control, and treatment BMPs) is a fundamental requirement of Order No. 2001-01. Shifting BMP implementation from an on-site focus to a regional focus violates this fundamental requirement.

The SDRWQCB is skeptical that large-scale regional BMPs would be cost effective. Treatment costs for municipal storm water generally increase with distance from the source. Regional "end of pipe" treatment also results in the loss of cost reducing opportunities for water quality improvements en route. Rather than increasing costs, small collection strategies, located at the point where runoff initially meets the ground, repeated consistently over entire projects, will usually yield the greatest water quality improvements for the least cost.[42] Furthermore, where regional approaches have been relatively successful, such as Fresno, generally few municipalities have been involved. In urbanized watersheds with many different jurisdictions, such as those in Los Angeles and San Diego, there will be significantly greater organizational and jurisdictional difficulties, and hence drastically higher costs. For example, the failure in the San Diego Region of a regional BMP approach, the Carmel Valley Restoration Project, occurred due to a breakdown in coordination among agencies and resulted in a $527,000 Administrative Civil Liability fine against the City of San Diego. While the SDRWQCB supports watershed based intergovernmental coordination, this coordination is not yet in place and may take many years to develop. Furthermore, the difficulties of coordination on a watershed level are only compounded when expanded to a regional level.

In specific cases, a coordinated regional approach may be appropriate for **existing** development. However, by its very definition, new development presents opportunities for on-site BMPs to be designed into the development as an integral component, at low cost, and with a greater likelihood for

[42] Bay Area Stormwater Management Agencies Association. 1999. Start at the Source. Forbes Custom Publishing.

protecting water quality downstream over the life of the development. Where a regional BMP approach is to be used, it must be done in conjunction with on-site BMPs. On-site BMPs provide the "pre-treatment" necessary to ensure effectiveness of any potential regional BMPs, as well as to minimize maintenance and the chance of "upsets."

The problem of locating and constructing regional end of pipe BMPs is also considerable. Costs associated with finding locations for the regional treatment facilities in areas that are already largely built out, as well as the hurdles that CEQA, Waste Discharge Requirements, and NPDES permitting may present, should not be ignored. Historically, the public has been very reluctant to support the construction of treatment facilities in their neighborhoods. Opposition to such facilities, especially along the coast, has been an especially virulent form of NIMBYism (Not In My Back Yard). Moreover, the construction, maintenance, and operation of such facilities sized to treat large, seasonal, and potentially toxic volumes of storm water runoff pose high costs and protracted time delays to implement. Additionally, popular short-term regional solutions, such as end of pipe diversions into sanitary sewers, are effective only for dry weather flows. The sanitary sewerage collection systems found in the San Diego region were not designed to handle the increased loads from dry weather flows, let alone flows from even minor storm runoff events. Likewise, the existing coastal Publicly Owned Treatment Works (POTWs) are not sized to treat wet weather flows, have almost no capacity for expansion, and will not be able to treat storm water flows.

Furthermore, a regional BMP approach (i.e. end of pipe treatment) will probably lead to a progressive erosion of storm water quality gains achieved through aforementioned education programs. Since most municipalities in Southern California have historically used natural drainage features as storm water conveyances, there could be a additional loss of beneficial uses, including aesthetic benefits, in those waterways upstream of the proposed regional mitigation facilities. The inadequate implementation of on-site BMPs, which may consequently result from focusing on regional end of pipe BMP approaches, may be more damaging than maintaining the status quo. The overall result of a regional BMP approach could be additional water quality degradation to already impacted receiving waters, while new development and significant redevelopment with inadequate BMP controls continues apace.

Finally, it is important to note that Governor Davis recently opposed increasing funding for regional diversion BMPs. In his veto message of a $6.9 million bill that would have funneled money to Orange County to help curb urban runoff and clean beaches, Davis said the legislation "focuses on a temporary, seasonal fix and does not provide for identification and elimination of the sources of contamination."

13. Issue: Will the SDRWQCB approve the Copermittees' Urban Runoff Management Programs (URMPs) and other submittals?

Response: No. The SDRWQCB does not approve dischargers' submittals.[43] It is the responsibility of the Copermittees to develop and implement adequate URMPs and other measures required by Order No. 2001-01 in a timely manner. In other words, a Copermittee cannot postpone implementation of its URMP because the URMP has not been approved by the SDRWQCB. The SDRWQCB will review the URMPs and other documents and provide comments where inadequacies are observed. Provision of comments by the SDRWQCB or lack thereof does not constitute approval on the part of the SDRWQCB. The SDRWQCB will provide as much guidance as possible regarding the requirements of Order No. 2001-01, but ultimately the responsibility for development and implementation lies with the Copermittees.

VI. FINDINGS DISCUSSION

1. Finding states the following:

COPERMITTEES ARE DISCHARGERS OF URBAN RUNOFF: Each of the persons in Table 1 below, hereinafter called Copermittees or dischargers, owns or operates a municipal separate storm sewer system (MS4), through which it discharges urban runoff into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Table 1. Municipal Copermittees

1.	*City of Carlsbad*	*11.*	*City of National City*
2.	*City of Chula Vista*	*12.*	*City of Oceanside*
3.	*City of Coronado*	*13.*	*City of Poway*
4.	*City of Del Mar*	*14.*	*City of San Diego*
5.	*City of El Cajon*	*15.*	*City of San Marcos*
6.	*City of Encinitas*	*16.*	*City of Santee*
7.	*City of Escondido*	*17.*	*City of Solana Beach*
8.	*City of Imperial Beach*	*18.*	*City of Vista*
9.	*City of La Mesa*	*19.*	*County of San Diego*
10.	*City of Lemon Grove*	*20.*	*San Diego Unified Port District*

Discussion: Section 402 of the Clean Water Act prohibits the discharge of any pollutant to waters of the United States from a point source, unless that

[43] This response refers to the SDRWQCB's policy against staff approval of dischargers' programs or documents. At times, the SDRWQCB will approve dischargers' programs or documents at a public hearing during the public process. An example of this is the Order No. 2001-01 requirement for the Copermittees to develop a model Standard Urban Storm Water Mitigation Plan (SUSMP). The model SUSMP is to be approved by the SDRWQCB during a public hearing. However, in general, the documents and programs required by Order No. 2001-01 will not be approved by SDRWQCB, and never by SDRWQCB staff.

discharge is authorized by a NPDES permit. Though urban runoff comes from a diffuse source, it is discharged through MS4s, which are point sources under the Clean Water Act. Federal NPDES regulation 40 CFR 122.26(a) (iii) and (iv) provide that discharges from MS4s, which service medium or large populations greater than 100,000 or 250,000 respectively, shall be required to obtain a NPDES permit. Federal NPDES regulation 40 CFR 122.26(a)(v) also provides that a NPDES permit is required for "A [storm water] discharge which the Director, or in States with approved NPDES programs, either the Director or the EPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States." Such sources are then designated into the program. See Attachment 1, NPDES Municipal Storm Water Permit Justifications, for an explanation on NPDES municipal storm water permit coverage for each municipality.

2. **Finding** states the following:

URBAN RUNOFF IS A "WASTE" AND A "POINT SOURCE DISCHARGE OF POLLUTANTS": Urban runoff is a waste, as defined in the California Water Code, that contains pollutants and adversely affects the quality of the waters of the State. The discharge of urban runoff from an MS4 is a "discharge of pollutants from a point source" into waters of the United States as defined in the Clean Water Act.

Discussion: The legal definition of "waste" can be found in California Water Code (CWC) section 13050(d), which states "'Waste' includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal." 40 CFR 122.2 defines "point source" as "any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." 40 CFR 122.2 defines "discharge of a pollutant" as "Any addition of any 'pollutant' or combination of pollutants to 'waters of the United States' from any point source." Also, the justification for control of pollution into Californian waters can be found at CWC Section 13260(a)(1).

3. **Finding** states the following:

URBAN RUNOFF CAUSES RECEIVING WATER DEGRADATION: Urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. As runoff flows over urban areas, it picks up harmful pollutants such as pathogens, sediment, fertilizers, pesticides, heavy metals, and petroleum products. These pollutants often become dissolved or suspended in urban runoff and are conveyed and discharged to receiving waters, such as streams, lakes, lagoons, bays, and the ocean without treatment. Once in receiving waters, these pollutants harm aquatic

life primarily through toxicity and habitat degradation. Furthermore, the pollutants can enter the food chain and may eventually enter the tissues of fish and humans.

There is a strong direct correlation between "urbanization" and "impacts to receiving water quality". In general, the more heavily developed the area, the greater the impacts to receiving waters from urban runoff.

Discussion: Urbanization generally results in an increase in pollutant sources and impervious surfaces. The increase in pollutant sources associated with human land use leads to an increase in pollutant loads found in urban runoff, while the increase in impervious surfaces associated with development prevents natural processes from reducing those pollutant loads. The impervious surfaces associated with urbanization prevent soil infiltration and natural vegetation filtration of urban runoff. The end result is urban runoff flows that are higher in volume and pollutant loads. This causes the quality of receiving waters to be adversely impacted and beneficial uses to be impaired.

The US EPA supports this finding, stating in its 1996 National Water Quality Inventory that urban runoff/discharges from storm sewers are a major source of water quality impairment nationwide.[44] The 1996 Inventory also found urban runoff to be the leading cause of ocean impairment for those ocean miles surveyed.[45] In addition, the Region's Clean Water Act section 303(d) list (see Attachment 2), which identifies water bodies with impaired beneficial uses within the region, also indicates that the impacts of urban runoff on receiving waters are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents which have been found at high levels within urban runoff by the regional storm water monitoring program.[46] Examples of constituents frequently responsible for beneficial use impairment include total and fecal coliform, heavy metals, and sediment; these constituents have been found at high levels in urban runoff both regionally and nationwide.[47, 48]

Beneficial use impairment resulting from urban runoff not only harms aquatic life, but can adversely impact human health as well. The US EPA finds that receiving water impairment from urban runoff can impact human health when it states "As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These

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44 US EPA. 1998. The National Water Quality Inventory, 1996 Report to Congress. EPA 841-R-97-008. As cited in 64 FR 68726.

45 US EPA. 1998. The National Water Quality Inventory, 1996 Report to Congress. EPA 841-R-97-008. As cited in 64 FR 68726.

46 City of San Diego. 1999. 1998-1999 City of San Diego and Co-permittee NPDES Storm Water Monitoring Program Report. By URS Greiner Woodward Clyde.

47 City of San Diego. 1999. 1998-1999 City of San Diego and Co-permittee NPDES Storm Water Monitoring Program Report. By URS Greiner Woodward Clyde.

48 US EPA. 1983. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.

pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans." [49]

4. Finding states the following:

URBAN DEVELOPMENT INCREASES POLLUTANT LOAD, VOLUME, AND VELOCITY OF RUNOFF: During urban development two important changes occur. First, natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots. Natural vegetated soil can both absorb rainwater and remove pollutants providing a very effective natural purification process. Because pavement and concrete can neither absorb water nor remove pollutants, the natural purification characteristics of the land are lost.

Secondly, urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4.

As a result of these two changes, the runoff leaving the developed urban area is significantly greater in volume, velocity and pollutant load than the pre-development runoff from the same area.

Discussion: Urbanization increases the amount of impervious ground cover of an area. For example, residential areas commonly cover the ground with approximately 30-70% impervious surfaces.[50] Regarding the impact of urbanization's impervious surfaces on urban runoff volume and velocity, the State Water Resources Control Board (SWRCB) Urban Runoff Technical Advisory Committee states in its 1994 report:

> Changes in stream hydrology resulting from urbanization include: increased peak discharges; increased total volume of runoff; decreased time needed for runoff to reach the stream; increased frequency and severity of flooding; changes in stream flow during dry periods due to reduced levels of infiltration in the watershed; and greater runoff velocity during storms.

This finding is further supported by the SDRWQCB's Water Quality Control Plan (Basin Plan). Regarding the impact of urban development on urban runoff pollutant loads, the Basin Plan states:

> Nonpoint source pollution is primarily the result of man's uses of land such as urbanization, roads and highways, vehicles, agriculture, construction, industry, mineral extraction, physical habitat alteration (dredging/filling), hydromodification (diversion, impoundment, channelization), silviculture (logging), and other activities which

[49] US EPA. 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

[50] Dunne, T. and Leopold, L.B. 1978. Water in Environmental Planning.

disturb land.[51] As a result, when rain falls on and drains through urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. The pollutants can be dissolved in the runoff and quickly transported by gravity flow through a vast network of concrete channels and underground pipes referred to as storm water conveyance systems. Such systems ultimately discharge the polluted runoff, without treatment, into the nation's creeks, rivers, estuaries, bays, and oceans.[52]

5. Finding states the following:

> *WATER QUALITY DEGRADATION INCREASES WITH PERCENT IMPERVIOUSNESS: The increased volume and velocity of runoff from developed urban areas greatly accelerates the erosion of downstream natural channels. Numerous studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of its receiving water quality. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 10% conversion from natural to impervious surfaces. (Developments of medium density single family homes range between 25 to 60% impervious). Today "% impervious coverage" is believed to be a reliable indicator and predictor of the water quality degradation expected from planned new development.*

Discussion: Studies have shown that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[53] One comprehensive study which looked at numerous areas, variables, and methods revealed that stream degradation occurs at levels of imperviousness as low as (10% to 20%).[54] Degradation indicates a decline in the biological integrity and physical habitat conditions that are necessary to support natural biological diversity. For instance, few urban streams can support diverse benthic communities with imperviousness greater or equal to 25%.[55] To provide some perspective, a medium density, single family home area can be from 25% to 60% impervious (variation due to street and parking design).[56]

The following figure shows the flow rate of an urban vs. a natural stream. What the figure demonstrates is that urban stream flows have greater peaks

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[51] SDRWQCB. 1994. Water Quality Control Plan for the San Diego Basin. Page 4-66.

[52] SDRWQCB. 1994. Water Quality Control Plan for the San Diego Basin. Page 4-69 through 4-70.

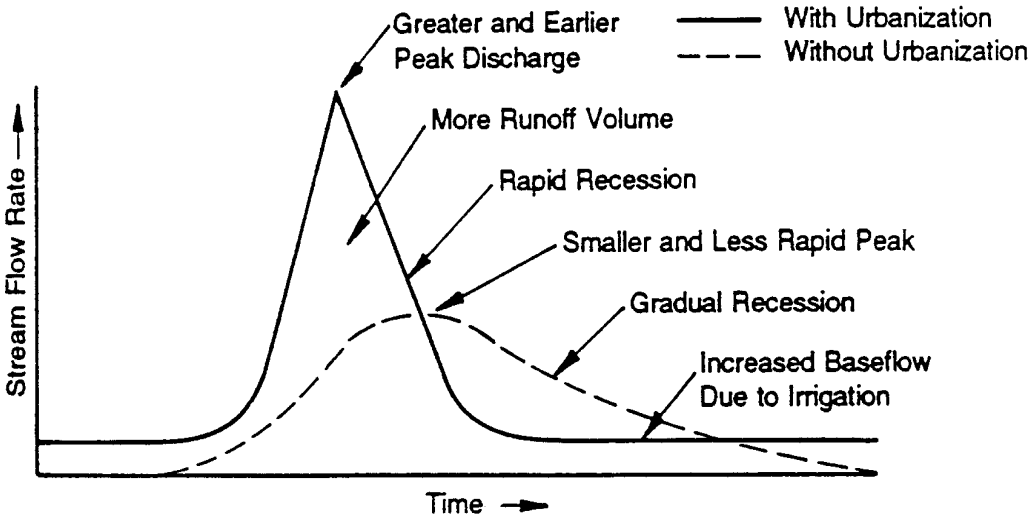
[53] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68725.

[54] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68725.

[55] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68725.

[56] Schueler, T.R. 1994. *The Importance of Imperviousness*. Watershed Protection Techniques. As cited in 64 FR 68725.

and volumes, as well as shorter retention times than natural stream flows. The greater peak flows and volumes result in stream degradation through increased erosion of stream banks and damage to aquatic habitat. The shorter retention times result in less time for sediments and other pollutants to settle before being carried out to the ocean. This sediment, and the associated pollutants it carries, can be a significant cause of degradation to the region's receiving waters, including coastal lagoons.



Source: Adapted from Schueler, 1997 [57]

6. Finding states the following:

URBAN RUNOFF IS A HUMAN HEALTH THREAT: Urban runoff contains pollutants, which threaten human health. Human illnesses have been clearly linked to recreating (i.e., swimming, surfing, etc.) near storm drains flowing to coastal beach waters. Such flows from urban areas often result in the posting or closure of local beaches.

Pollutants transported to receiving waters by urban runoff can also enter the food chain. Once in the food chain they can "bioaccumulate" in the tissues of invertebrates (e.g., mussels, oysters, and lobsters) and fish which may be eventually consumed by humans. Furthermore, some pollutants are also known to "biomagnify". This phenomenon can result in pollutant concentrations in the body fat of top predators that are millions of times greater than the concentrations in the tissues of their lower trophic (food chain) counterparts or in ambient waters.

Discussion: This finding is supported by a landmark study conducted by the Santa Monica Bay Restoration Project. The study found that there was an increased occurrence of illness in people that swam in proximity to a flowing storm drain outlet.[58]

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[57] Schueler, T.R. 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Metropolitan Washington Council of Governments.

[58] Haile, R.W., et al. 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.

In addition to the human health risk urban runoff poses from bodily contact, urban runoff also has the potential to adversely impact human health through bioaccumulation/biomagnification of urban runoff pollutants in the food chain. Pollutants such as heavy metals and pesticides, which are commonly found in urban runoff, have been found to bioaccummulate and biomagnify in long-lived organisms at the higher trophic levels.[59] Since many aquatic species are utilized for human consumption, toxic substances accumulated in species' tissues can pose a significant threat to public health.

The US EPA supports this finding when it states "As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans." [60]

7. Finding states the following:

POLLUTANT TYPES: The most common categories of pollutants in urban runoff include total suspended solids, sediment (due to anthropogenic activities); pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.

Discussion: US EPA Nationwide Urban Runoff Program (NURP) data shows that heavy metals, organics, coliform bacteria, nutrients (e.g., fertilizers), oxygen demanding substances (e.g., decaying vegetation), and total suspended solids are found at relatively high levels in urban runoff.[61] The Basin Plan goes on to identify examples of nonpoint sources in southern California to include lawn and garden chemicals, household and automotive care products dumped or drained on streets, sediment that erodes from construction sites, and various pollutants deposited by atmospheric deposition.[62] In addition, the SWRCB Urban Runoff Technical Advisory Committee finds urban runoff pollutants to include sediment, nutrients, oxygen-demanding substances, road salts, heavy metals, petroleum hydrocarbons, pathogenic bacteria, viruses, and pesticides."

8. Finding states the following:

URBAN STREAMS AS AN MS4 COMPONENT: Historic and current development make use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-

[59] Abel, P.D. 1996. Water Pollution Biology.

[60] US EPA. 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

[61] US EPA. 1983. Results of the Nationwide Urban Runoff Program, Volume 1-Final Report.

[62] SDRWQCB. 1994. Water Quality Control Plan for the San Diego Basin. Page 4-1.

made, or partially modified features. In these cases, the urban stream is both an MS4 and a receiving water.

Discussion: Natural drainage patterns and urban streams are frequently used by municipalities to convey urban runoff away from development within their jurisdiction. This is exhibited when urban streams and natural drainage systems are often altered (channelized, lined, widened, etc.) by municipalities in order to control and convey the increased urban runoff flows resulting from the urban development. Since the natural drainage or urban stream is used by the municipality to convey urban runoff, it becomes part of the municipality's MS4. However, urban streams and natural drainages used to convey urban runoff are part of a municipality's MS4 regardless of whether they have been altered by the municipality or not. For example, urban streams frequently run back and forth between lined and unlined (or natural) segments. Changes in the condition of an urban stream's channel (lined or unlined) does not constitute a change in the use of the urban stream or drainage by a municipality. In this manner, urban streams can be both receiving waters and MS4s.

9. Finding states the following:

URBAN RUNOFF CAUSES BENEFICIAL USE IMPAIRMENT: Individually and in combination, the discharge of pollutants and increased flows from MS4s can cause or threaten to cause a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance. The discharge of pollutants from MS4s can cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses.

Discussion: The Basin Plan supports this finding:

> [W]hen rain falls on and drains through urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. The pollutants can be dissolved in the runoff and quickly transported by gravity flow through a vast network of concrete channels and underground pipes referred to as storm water conveyance systems. Such systems ultimately discharge the polluted runoff, without treatment, into the nation's creeks, rivers, estuaries, bays, and oceans. […] These pollutants severely degrade the beneficial uses of surface waters, and threaten the health of both humans and aquatic organisms.[63]

The US EPA also supports this finding, stating in its 1996 National Water Quality Inventory that urban runoff/discharges from storm sewers are a major source of water quality impairment nationwide.[64] The 1996 Inventory also found urban runoff to be the leading cause of ocean impairment for

[63] SDRWQCB. 1994. Water Quality Control Plan for the San Diego Basin. Page 4-69 through 4-70.

[64] US EPA. 1998. The National Water Quality Inventory, 1996 Report to Congress. EPA 841-R-97-008. As cited in 64 FR 68726.

those ocean miles surveyed.[65] In addition, the Region's Clean Water Act section 303(d) list (see Attachment 2), which identifies water bodies with impaired beneficial uses within the region, also indicates that the impacts of urban runoff on receiving waters are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents which have been found at high levels within urban runoff by the regional storm water monitoring program.[66] Examples of constituents frequently responsible for beneficial use impairment include total and fecal coliform, heavy metals, and sediment; these constituents have been found at high levels in urban runoff both regionally and nationwide.[67,68]

10. Finding states the following:

COPERMITTEES IMPLEMENT URBAN RUNOFF MANAGEMENT PROGRAMS (URMPs): Copermittee implementation of Urban Runoff Management Programs (URMPs) designed to reduce discharges of pollutants and flow into and from MS4s to the maximum extent practicable (MEP) can protect receiving water quality by promoting attainment of water quality objectives necessary to support designated beneficial uses. To be most effective, URMPs must contain both structural and non-structural best management practices (BMPs).

Discussion: US EPA finds that a "satisfactory proposed management program will address: management practices; control techniques and systems; design and engineering methods; and other measures to ensure the reduction of pollutants to the maximum extent practicable (MEP)."[69] The US EPA further states that "at a minimum, the proposed management program must include: […] Identification of structural control measures to be included in these proposed programs."[70] These statements indicate that it is expected that URMPs be developed by the Copermittees which contain both structural and non-structural BMPs for the purpose of reducing pollutants in MS4 discharges to the maximum extent practicable. When pollutants in MS4 discharges are treated to the maximum extent practicable, receiving water quality and beneficial uses are typically protected through the attainment of water quality objectives. However, its should be noted that pollutant discharges which have the potential to cause or contribute to an exceedance of water quality objectives (such as discharges to Clean Water Act section 303(d) waterbodies) may require implementation of BMPs beyond the "maximum extent practicable" standard (40 CFR 122.44(d)(1)(i).

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65 US EPA. 1998. The National Water Quality Inventory, 1996 Report to Congress. EPA 841-R-97-008. As cited in 64 FR 68726.

66 City of San Diego. 1999. 1998-1999 City of San Diego and Co-permittee NPDES Storm Water Monitoring Program Report. By URS Greiner Woodward Clyde.

67 City of San Diego. 1999. 1998-1999 City of San Diego and Co-permittee NPDES Storm Water Monitoring Program Report. By URS Greiner Woodward Clyde.

68 US EPA. 1983. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.

69 US EPA. 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

70 US EPA. 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

11. Finding states the following:

> *BEST MANAGEMENT PRACTICES (BMPs): Pollutants can be effectively reduced in urban runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control (or structural) BMPs remove pollutants from urban runoff.*

Discussion: The SWRCB finds in its Order WQ 98-01 that BMPs are effective in reducing pollutants in urban runoff, stating that "implementation of BMPs [is] generally the most appropriate form of effluent limitations when designed to satisfy technology requirements, including reduction of pollutants to the maximum extent practicable." The SWRCB Urban Runoff Technical Advisory Committee further supports this finding by recommending "that nonpoint source pollution control can be accomplished most effectively by giving priority to [best management practices] in the following order:

1. Prevention – implementation of practices that use or promote pollution free alternatives;
2. Source Control – implementation of control measures that focus on preventing or minimizing urban runoff from contacting pollution sources;
3. Treatment Controls – implementation of practices that require treatment of polluted runoff either onsite or offsite."

US EPA also supports the utilization of a combination of BMPs to address pollutants in urban runoff. For example, US EPA has found there has been success in addressing illicit discharge related problems through BMP initiatives like storm drain stenciling and recycling programs, including household hazardous waste special collection days.[71] Structural BMP performance data has also been compiled and summarized by US EPA.[72] This data indicates that structural BMPs can be effective in reducing pollutants in urban runoff discharges. The summary provides the performance ranges of various types of structural BMPs for removing suspended solids, nutrients, pathogens, and metals from storm water flows. These pollutants are in general the pollutants of most concern in storm water in the San Diego Region. For suspended solids, the least effective structural BMP type was found to remove 30-65% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For nutrients, the least effective structural BMP type was found to

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[71] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68728.

[72] USEPA. 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA 821-R-99-012.

remove 15-45% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For pathogens, the least effective structural BMP type was found to remove <30% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For metals, the least effective structural BMP type was found to remove 15-45% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load.

12. Finding states the following:

POLLUTION PREVENTION: Pollution prevention, the initial reduction/elimination of pollutant generation at its source, is the best "first line of defense" for Copermittees and should be used in conjunction with source control and treatment control BMPs. Pollutants that are never generated do not have to be controlled or treated.

Discussion: Pollution prevention, the reduction or elimination of pollutant generation at its source, is an essential aspect of BMP implementation. By limiting the generation of pollutants by urban activities, less pollutants are available to be washed from urban areas, resulting in reduced pollutant loads in storm water discharges from these areas. In addition, there is no need to control or treat pollutants which are not initially generated. Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media.

In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. California Water Code section 13263.3(a) also supports pollution prevention, stating "The Legislature finds and declares that pollution prevention should be the first step in a hierarchy for reducing pollution and managing wastes, and to achieve environmental stewardship for society. The Legislature also finds and declares that pollution prevention is necessary to support the federal goal of zero discharge of pollutants into navigable waters." Finally, the Basin Plan also supports this finding by stating that "[T]o eliminate pollutants in storm water, one can either clean it up by removing pollutants or prevent it from becoming polluted in the first place. Because of the overwhelming volume of storm water and the enormous costs associated with pollutant removal, pollution prevention is the only approach that makes sense."

13. Finding states the following:

RECEIVING WATER LIMITATIONS: Compliance with receiving water limits based on applicable water quality objectives is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality objectives and the creation of conditions of pollution.

Discussion: Urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. Due to this significant contribution to the impairment of receiving waters, discharges from MS4s that cause or contribute to the

violation of water quality standards (i.e., beneficial uses and the water quality objectives necessary to protect those uses) must be controlled and prohibited. MS4 permits must therefore include stringent discharge requirements to protect water bodies from discharges from MS4s.

The issue of whether storm water discharges from MS4s must meet water quality standards has been intensely debated for the past five years. The argument arises because Clean Water Act section 402(p) fails to clearly state that municipal dischargers of storm water must meet water quality standards. On the issue of industrial discharges of storm water, the statute clearly indicates that industrial dischargers must meet both (1) the technology-based standard of "best available technology economically achievable (BAT)" and (2) applicable water quality standards. On the issue of municipal discharges however, the statute states that municipal dischargers must meet (1) the technology-based standard of "maximum extent practicable (MEP)" and (2) "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants." The statute fails, however, to specifically state that municipal dischargers must meet water quality standards.

As a result, the municipal storm water dischargers have argued that they do not have to meet water quality standards; and that they only are required to meet MEP. Environmental interest groups maintain that not only do MS4 discharges have to meet water quality standards, but that MS4 permits must also comply with numeric effluent limitations for the purpose of meeting water quality standards. On the issue of water quality standards, the US EPA, the SWRCB, and the SDRWQCB have consistently maintained that MS4s must indeed comply with water quality standards. On the issue of whether water quality standards must be met by numeric effluent limits, the US EPA, the SWRCB (in Orders WQ 91-03 and WQ 91-04), and the SDRWQCB have maintained that MS4 permits can, at this time, contain narrative requirements for the implementation of BMPs in place of numeric effluent limits.

SWRCB rationale: In addition to relying on US EPA's legal opinion concluding that MS4s must meet MEP and water quality standards, the SWRCB also relied on the Clean Water Act's explicit authority for States to require "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants" in addition to the technology-based standard of MEP. To further support its conclusions that MS4 permit dischargers must meet water quality standards, the SWRCB relied on provisions of the California Water Code that specify that all waste discharge requirements must implement applicable Basin Plans and take into consideration the appropriate water quality objectives for the protection of beneficial uses.

The SWRCB first formally concluded that permits for MS4s must contain effluent limitations based on water quality standards in its Order WQ 91-03. In that Order, the SWRCB also concluded that it was appropriate for Regional Boards to achieve this result by requiring best management practices, rather than by inserting numeric effluent limitations into MS4 permits. In Order WQ 98-01, the SWRCB prescribed specific precedent setting Receiving Water Limitations language to be included in all future MS4 permits. This language specifically requires that MS4 dischargers meet water quality standards and allows for the use of narrative BMPs (increasing in stringency and implemented in an iterative process) as the mechanism by which water quality standards can be met.

In Order WQ 99-05, the SWRCB modified its receiving water limitations language in Order WQ 98-01 to meet specific objections by the US EPA (the modifications resulted in stricter compliance with water quality standards). SWRCB Order WQ 99-05 states "In Order WQ 98-01, the State Water Resources Control Board (State Water Board) ordered that certain receiving water limitation language be included in future municipal storm water permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Regional Water Quality Control Boards (Regional Water Boards) for Vallejo and Riverside respectively, the United States Environmental Protection Agency (EPA) objected to the permits. The EPA objection was based on the receiving water limitation language. The EPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.

"In light of EPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the State Water Board is revising its instructions regarding receiving water limitation language for municipal storm water permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the EPA language. Based on the reasons stated here, and as a precedent decision, the following receiving water limitation language [which is found in Receiving Water Limitations item C. of Order No. 2001-01] shall be included in future municipal storm water permits."

In a late 1999 case involving MS4 permits issued by US EPA to several Arizona cities (*Defenders of Wildlife v. Browner*, 1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit upheld US EPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of US EPA's discretion rather than on the basis of strict compliance with the Clean Water Act. In other words, while holding that the Clean Water Act does not require all MS4 discharges to comply strictly with state water quality standards, the Court also held that US EPA has the authority to determine that ensuring strict compliance with state water quality standards is necessary to control pollutants. On the question of

whether MS4 permits must contain numeric effluent limitations, the court upheld US EPA's use of iterative BMPs in place of numeric effluent limits.

SWRCB's final position: On October 14, 1999, the SWRCB issued a legal opinion on the federal appellate decision and provided advice to the Regional Boards on how to proceed in the future. In the memorandum, the SWRCB concludes that the recent Ninth Circuit opinion upholds the discretion of US EPA and the State to (continue to) issue permits to MS4s that require compliance with water quality standards through iterative BMPs. Moreover, the memorandum states that "[…] because most MS4 discharges enter impaired water bodies, there is a real need for permits to include stringent requirements to protect those water bodies. As total maximum daily loads (TMDLs) are developed, it is likely that MS4s will have to participate in pollutant load reductions, and the MS4 permits are the most effective vehicles for those reductions." In summary, the SWRCB concludes that the Regional Boards should continue to include the Receiving Water Limitations language established in SWRCB Order WQ 99-05 in all future permits.

Accordingly, the SDRWQCB has included the Receiving Water Limitations language in Receiving Water Limitations item C. of Order No. 2001-01.

14. Finding states the following:

RECEIVING WATER LIMITATION COMPLIANCE STRATEGY: Implementation of BMPs cannot ensure attainment of receiving water quality objectives under all circumstances; some BMPs may not prove to be as effective as anticipated. An iterative process of BMP development, implementation, monitoring, and assessment is necessary to assure that an Urban Runoff Management Program is sufficiently comprehensive and effective to achieve compliance with receiving water quality objectives.

Discussion: As discussed above in the Finding 13 discussion, the US EPA and SWRCB have discretion to issue municipal storm water permits which require compliance with water quality standards. To ensure that MS4 discharges comply with water quality standards, the SWRCB has adopted US EPA language in SWRCB Order WQ 99-05 which dictates implementation of an iterative BMP process when water quality standards are not met. This language is included in Order No. 2001-01 in Receiving Water Limitations item C. The iterative BMP process requires the implementation of increasingly stringent BMPs until receiving water standards are achieved. This is necessary because implementation of BMPs alone cannot ensure attainment of receiving water quality objectives. For example, a BMP which is effective in one situation may not be applicable in another. An iterative process of BMP development, implementation, and assessment is needed to promote consistent compliance with receiving water quality objectives. If assessment of a given BMP confirms that the BMP is ineffective, the iterative process should be restarted, with redevelopment of a new BMP which is anticipated to result in compliance with receiving water quality objectives. Regarding BMP assessment, the SWRCB Urban Runoff Technical Advisory

Committee states "The [Storm Water Pollution Prevention Plan] SWPPP must be revised if an inspection indicates a need to alter the BMPs: drop ineffective BMPs, add new BMPs, or modify a BMP that is to remain in the SWPPP." It should be noted that while implementation of the iterative BMP process is a means to achieve compliance with water quality objectives, it does not shield the discharger from enforcement actions for continued non-compliance with water quality objectives.

15. Finding states the following:

COPERMITTEES' RESPONSIBILITY FOR ILLICIT DISCHARGES FROM THIRD PARTIES: As operators of MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to the waters of the United States, the operator of an MS4 that does not prohibit and/or control discharges into its system essentially accepts "title" for those discharges.

Discussion: Clean Water Act section 402(p) requires operators of MS4s to prohibit non-storm water into their MS4s. This is necessary because pollutants which enter the MS4 generally are conveyed through the MS4 to be eventually discharged into receiving waters. If a municipality does not prohibit non-storm water discharges, it is providing the pathway (its MS4) which enables pollutants to reach receiving waters. Since the municipality's storm water management service can result in pollutant discharges to receiving waters, the municipality must accept responsibility for the water quality consequences resulting from this service. Furthermore, third party discharges can cause a municipality to be out of compliance with its permit. Since pollutants from third parties which enter the MS4 will eventually be discharged from the MS4 to receiving waters, the third party discharges can result in a situation of municipality non-compliance if the discharges lead to an exceedance of water quality standards. For these reasons, each Copermittee must prohibit and/or control discharges from third parties to its MS4.

16. Finding states the following:

COPERMITTEES' RESPONSIBILITY BASED ON LAND USE AUTHORITY: Utilizing their land use authority, Copermittees authorize and profit from the urban development which generates the pollutants and runoff that impair receiving waters. Since the Copermittees utilize their legal authority to authorize urbanization, they must also exercise their legal authority to ensure that the resulting increased pollutant loads and flows do not further degrade receiving waters.

Discussion: Storm water permits are issued to municipalities because of their land use authority. The ultimate responsibility for the pollutant discharges, increased runoff, and inevitable long-term water quality degradation that results from urbanization lies with local governments. This responsibility is based on the fact that it is the local governments that have authorized the urbanization (i.e., conversion of natural pervious ground cover to impervious urban surfaces) and the land uses that generate the pollutants and runoff. Furthermore, the MS4 through which the pollutants and

increased flows are conveyed, and ultimately discharged into San Diego's natural receiving waters, are owned and operated by the same local governments. In summary, the municipal Copermittees under Order No. 2001-01 are responsible for discharges into and out of their storm water conveyance systems because (1) they own and operate the MS4; and (2) they have the legal authority that authorizes the very development and land uses with generate the pollutants and increased flows in the first place.

Order No. 2001-01 holds the local government accountable for this direct link between its land use decisions and water quality degradation. The permit recognizes that each of the three major stages in the urbanization process (development planning, construction, and the use or operational stage) are controlled by and must be authorized by the local government. Accordingly, this permit requires the local government to implement, or require others to implement, appropriate best management practices to reduce pollutant discharges and increased flow during each of the three stages of urbanization.

For example, since grading cannot commence prior to the issuance of a local grading permit, the Copermittees have a built-in mechanism to ensure that all grading activities are protective of receiving water quality. The Copermittee has the authority and discretion to withhold issuance of the grading permit until the project proponent has demonstrated to the satisfaction of the Copermittee that the project will not violate the Copermittee's ordinances or cause the Copermittee to be in violation of its municipal storm water permit. Since the Copermittee will ultimately be held responsible for any discharges from the grading project by the SDRWQCB, the Copermittee will want to use its own permitting authority to ensure that whatever measures the Copermittee deems necessary to protect discharges into its MS4 are in fact taken by the project proponent.

17. Finding states the following:

THREE PHASES OF URBAN DEVELOPMENT: Urban development has three major phases: (1) land use planning for new development; (2) construction; and (3) the "use" or existing development phase. Because the Copermittees authorize, permit, and profit from each of these phases, and because each phase has a profound impact on water quality, the Copermittees have commensurate responsibilities to protect water quality during each phase.

In other words, Copermittees are held responsible for the short and long-term water quality consequences of their land use planning, construction, and existing development decisions.

Discussion: Through its permitting processes, each Copermittee authorizes the three major phases of urban development within its jurisdiction. Each Copermittee can also profit from the authorization of urban development. For these reasons, each Copermittee must assume responsibility for its urban development decisions (see also the Discussion for Finding 16). The Federal Regulations clearly require municipalities to address urban runoff during

each stage of development. Regarding BMP implementation during each stage of urban development, US EPA recommends that Copermittees ensure the appropriate implementation of the structural BMPs by considering some or all of the following: pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for noncompliance with design, construction or operation and maintenance.[73]

18. Finding states the following:

PLANNING PHASE FOR NEW DEVELOPMENT: Because land use planning and zoning is where urban development is conceived, it is the phase in which the greatest and most cost effective opportunities to protect water quality exists. When a Copermittee incorporates policies and principles designed to safeguard water resources into its General Plan and development project approval processes, it has taken a far-reaching step towards the preservation of local water resources for future generations.

Discussion: Including plans for BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce urban runoff pollutant loads to surface waters.[74] The Phase II regulations for small municipalities reflect the necessity of addressing urban runoff during the early planning phase. Due to the greater water quality concerns generally experienced by larger municipalities, Phase II requirements for small municipalities are also applicable to larger municipalities such as the Copermittees. The Phase II regulations direct municipalities to develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The program must ensure that controls are in place that would prevent or minimize water quality impacts. This includes developing and implementing strategies which include a combination of structural and/or non-structural BMPs appropriate to the locality. The program must also ensure the adequate long-term operation and maintenance of BMPs.[75] US EPA expands on the Phase II regulations for urban development when it recommends that Copermittees:

> "[A]dopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural

[73] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68845.

[74] US EPA. 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

[75] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68845.

and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures. In developing your program, you should consider assessing existing ordinances, policies, programs and studies that address storm water runoff quality."

19. Finding states the following:

CONSTRUCTION PHASE: Construction activities are a significant cause of receiving water impairment. Siltation is currently the largest cause of river impairment in the United States. Sediment runoff rates from construction sites greatly exceed natural erosion rates of undisturbed lands causing siltation and impairment of receiving waters. In addition to requiring implementation of the full range of BMPs, an effective construction runoff program must include local plan review, permit conditions, field inspections, and enforcement.

Discussion: The US EPA strongly supports this finding in the Phase II regulations. The US EPA explains in the regulations that storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. Specifically, the biological, chemical and physical integrity of the waters may become severely compromised due to runoff from construction sites. Fine sediment from construction sites can adversely affect aquatic ecosystems by reducing light penetration, impeding sight-feeding, smothering benthic organisms, abrading gills and other sensitive structures, reducing habitat by clogging interstitial spaces within the streambed, and reducing intergravel dissolved oxygen by reducing the permeability of the bed material. Water quality impairment also results, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants, such as nutrients, metals, and organic compounds into aquatic systems.[76]

20. Finding states the following:

EXISTING DEVELOPMENT: The Copermittees' wet weather monitoring results collected during the past decade, as well as volumes of other references in the literature today, confirm substantial pollutant loads to receiving waters in runoff from existing urban development. Implementation of jurisdictional and watershed URMPs, which include extensive controls on existing development, can reduce pollutant loadings over the long term.

Discussion: This finding is supported by the results of the City of San Diego and Co-permittee NPDES Stormwater Monitoring Program annual reports.[77]

21. Finding states the following:

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[76] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68728.

[77] City of San Diego. Multiple Years. City of San Diego and Co-permittee NPDES Stormwater Monitoring Program. Prepared by Woodward Clyde Consultants.

CHANGES NEEDED: Because the urbanization process is a direct and leading cause of water quality degradation in this Region, fundamental changes to existing policies and practices about urban development are needed if the beneficial uses of San Diego's natural water resources are to be protected.

Discussion: Urban runoff has been recognized as a leading cause of water quality degradation both regionally and nationwide. The 1998-1999 City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program Report reflects the water quality issues resulting from urban runoff that have been observed in the San Diego region and on a nationwide level. Monitoring efforts indicate that instream concentrations of pathogen indicators (fecal coliform and streptococcus) and heavy metals (such as cadmium, copper, lead, and zinc) exceed state and federal water quality criteria. In addition, storm water within the region has been found to contain the pesticides diazinon and chlorpyrifos (Dursban) at levels which can cause chronic or acute toxicity.[78]

As the monitoring program results indicate, urban runoff is identified as a primary source of receiving water quality impairment within the Region. Though urban land use occupies approximately 30% of the monitoring program study area, approximately 50% or more of the total pollutant load for many constituents is contributed by urbanized land uses including residential, commercial, and industrial land uses.[79] The Region's Clean Water Act Section 303(d) list, which identifies water bodies with impaired beneficial uses within the Region, also indicates that the impacts of urban runoff are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents which have been found at high levels within urban runoff by the regional storm water monitoring program. Examples of constituents frequently responsible for beneficial use impairment include total and fecal coliform, heavy metals, and sediment; these constituents have been found at high levels in urban runoff both regionally and nationwide.

Clearly, current policies and practices to protect water quality from the impacts of urbanization have not been entirely effective. A shift is toward new and expanded policies and practices is needed to achieve the requirements of the Clean Water Act. The requirements of Order No. 2001-01 include and encourage new policies and practices to manage urban runoff. These new policies and practices are based on US EPA and SWRCB guidance, and are supported by recent and ongoing research. The requirements of Order No. 2001-01 are discussed individually in further detail in section VII of this Fact Sheet/Technical Report.

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[78] City of San Diego. 1999. 1998-1999 City of San Diego and Co-permittee NPDES Stormwater Monitoring Program Report. Prepared by URS Greiner Woodward Clyde.

[79] City of San Diego. 1998. 1997-1998 City of San Diego and Co-permittee NPDES Stormwater Monitoring Program Report. Woodward Clyde Consultants.

22. Finding states the following:

DUAL REGULATION OF INDUSTRIAL AND CONSTRUCTION SITES: Discharges of runoff from industrial and construction sites in this Region are subject to dual (state and local) regulation. (1) All industries and construction sites are subject to the local permits, plans, and ordinances of the municipal jurisdiction in which it is located. Pursuant to this Order, local (storm water, grading, construction, and use) permits, plans, and ordinances must (a) prohibit the discharge of pollutants and non-storm water into the MS4; and (b) require the routine use of BMPs to reduce pollutants in site runoff. (2) Many industries and construction sites are also subject to regulation under the statewide General Industrial Storm Water Permit or statewide General Construction Storm Water Permit . These statewide general permits are adopted by the State Water Resources Control Board and enforced by the nine Regional Water Quality Control Boards throughout California. Like the Copermittees' local permits and ordinances, the statewide General Industrial and Construction Permits also (a) prohibit the discharge of pollutants and non-storm water; and (b) require the routine use of BMPs to reduce pollutants in site runoff.

Recognizing that both authorities share a common goal, the federal storm water regulations at 40 CFR 122.26 (and its preamble) call for the dual system to ensure the most effective oversight of industrial and construction site discharges. Under this dual system, each municipal Copermittee is responsible for enforcing its local permits, plans, and ordinances within its jurisdiction. Similarly, the SDRWQCB is responsible for enforcing both statewide general permits and this Order within the San Diego Region.

Discussion: US EPA finds the control of pollutant discharges from industry and construction so important to receiving water quality that it has established a double system of regulation over industrial and construction sites. This double system of regulation consists of two parallel regulatory systems with the same common objective: to keep pollutants from industrial and construction sites out of the MS4. In this double system of regulation for runoff from industrial and construction sites, local governments must enforce their legal authorities (i.e., local ordinances and permits) while the SDRWQCB must enforce its legal authority (i.e., statewide general industrial and construction storm water permits). These two regulatory systems are designed to complement and support each other. Municipalities are not required to enforce SDRWQCB and SWRCB permits; however, they are required to enforce their ordinances and permits. The Federal regulations are clear that municipalities have responsibility to address runoff from industrial and construction sites which enters their MS4s.

Municipalities have this responsibility because they have the authority to issue land use and development permits. Since municipalities are the lead permitting authority for industrial land use and construction activities, they are also the lead for enforcement regarding runoff discharges from these sites. For sites where the municipality is the lead permitting authority, the SDRWQCB will work with the municipality and provide support where needed. In some instances, where the SDRWQCB is the primary regulatory authority and lead permitting authority (e.g., for landfills and sewage collection and treatment systems), the SDRWQCB is the lead for enforcement and will look for support from the municipalities.

23. Finding states the following:

> *EDUCATION: Education is the foundation of every effective URMP and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions impact receiving water quality and how these impacts can be minimized.*

Discussion: The SWRCB and US EPA both recognize education as a critical component of storm water management. In its 1994 report, the SWRCB Technical Advisory Committee (TAC) "recognizes that education with an emphasis on pollution prevention is the fundamental basis for solving nonpoint source pollution problems." The TAC goes on to recommend that target audiences for education efforts include the government, youth groups, the development community, and business and industrial groups. According to the Phase II Storm Water Regulations found at 64 FR 68754 and 68754, US EPA believes that as the public gains a greater understanding of the storm water program through education, the municipality is likely to gain more support for the program (including funding initiatives). In addition, compliance with the program will probably be greater is the public understands the personal responsibilities expected of them. US EPA goes on to explain that a public education program should inform individuals and households about problems and the steps they can take to reduce or prevent storm water pollution.

24. Finding states the following:

> *ENFORCING LOCAL LEGAL AUTHORITY: Enforcement of local urban runoff related ordinances, permits, and plans is an essential component of every URMP and is specifically required in the federal storm water regulations and this Order. Routine inspections provide an effective means by which Copermittees can evaluate compliance with their permits and ordinances. Inspections are especially important at high-risk areas for pollutant discharges such as industrial and construction sites.*
>
> *When industrial or construction site discharges occur in violation of local permits and ordinances, the SDRWQCB looks first to the municipality that has authorized the discharge for appropriate actions (typically education followed by enforcement where education has been unsuccessful). If the municipality has demonstrated a good faith effort to educate and enforce but remains unsuccessful, the SDRWQCB will then step in to enforce the applicable statewide general permit. If the municipality has not demonstrated a good faith enforcement effort, the SDRWQCB may initiate enforcement action against both the industrial or construction discharger (under the statewide general permit), as well as against the authorizing municipal Copermittee for violations of this Order. Each Copermittee must also provide the first level of enforcement against illegal discharges from other land uses it has authorized, such as commercial and residential developments that it has authorized.*

Discussion: Since municipalities approve and permit construction and land use within their jurisdiction, they must assume responsibility for urban runoff

discharges from these activities and land uses. The Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A – D) are clear in placing responsibility on municipalities for control of urban runoff from third party activities and land uses to their MS4. In order for municipalities to assume this responsibility, they must implement ordinances, permits, and plans addressing urban runoff from third parties. Assessments for compliance with their ordinances, permits, and plans are essential for a municipality to ensure that third parties are not causing the municipality to be in violation of its municipal storm water permit. When conditions of non-compliance is determined, enforcement is necessary to ensure that violations of municipality ordinances and permits are corrected. Without enforcement, third parties do not have incentive to correct violations. US EPA supports inspections and enforcement by municipalities when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[80]

US EPA discusses the "dual regulation" of construction sites in its *Storm Water Phase II Compliance Assistance Guide*, which states "Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure […] is needed to induce more localized site regulation and enforcement efforts, and to enable operators […] to more effectively control construction site discharges into their MS4s." While the *Storm Water Phase II Compliance Assistance Guide* applies to small municipalities, requirements for small municipalities are applicable to larger municipalities, such as the Copermittees, due to the generally more serious water quality problems caused by larger municipalities.

Municipalities assume initial responsibility for enforcement against illegal discharges from land uses and activities within their jurisdiction because of their land use authority. Since the municipality approves and permits development and land use, it must ensure that its development or land use decisions do not result in receiving water quality degradation. The SDRWQCB will assist municipalities in enforcement against non-compliant sites after the municipality has exhibited a good faith effort to bring the site into compliance.

25. Finding states the following:

PUBLIC PARTICIPATION: Public participation during the URMP development process is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

[80] US EPA. 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

Discussion: This finding is supported by the Phase II Storm Water Regulations found at 64 FR 68755 which states, "[E]arly and frequent public involvement can shorten implementation schedules and broaden public support for a program." It goes on to explain,"[P]ublic participation is likely to ensure a more successful storm water program by providing valuable expertise and a conduit to other programs and governments."

26. Finding states the following:

TOXICITY: Urban runoff discharges from MS4s often contain pollutants that cause toxicity, (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Water Quality Control Plan, San Diego Basin, Region 9, (Basin Plan), state in part "All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge…" Urban runoff discharges from MS4s are considered toxic when (1) the toxic effect observed in an acute toxicity test exceeds zero Toxic Units Acute (TUa=0); or (2) the toxic effect observed in a chronic toxicity test exceeds one Toxic Unit Chronic (TUc=1).

Discussion: Consideration of urban runoff toxicity is significant because toxicity assessments measure the potential effect of a discharge on receiving waters. This is particularly useful in assessing impacts, as opposed to measurements of pollutant concentrations where the effect of the pollutant concentration on receiving waters may be unknown. Finding 26 and this discussion clarify SDRWQCB expectations regarding urban runoff toxicity. Toxicity is also further discussed in Appendix I of the SWRCB's 1997 Water Quality Control Plan – Ocean Waters of California, "California Ocean Plan."

Toxicity is commonly evaluated in terms of both acute toxicity and chronic toxicity. "Acute toxicity concentration" can be expressed in Toxic Units Acute (TUa). The Ocean Plan defines acute toxicity and a method for calculating TUa in a manner that can be used for ocean waters and other waters. Using this Ocean Plan definition and calculation methodology, 100% survival of test organisms in an acute toxicity test yields an acute toxicity concentration of zero TUa. 100% survival of test organisms corresponds to the Basin Plan narrative objective of 'no toxics in toxic amounts.' Therefore, an acute toxicity concentration in excess of zero TUa would not meet the Basin Plan narrative objective for toxicity.

"Chronic toxicity concentration" can be expressed in Toxic Units Chronic (TUc). As with acute toxicity, the Ocean Plan defines chronic toxicity and a method for calculating TUc that can be used for ocean waters and other waters. Using this Ocean Plan definition and calculation methodology, the absence of observable effects on test organisms in undiluted test water in a critical life stage toxicity test yields a chronic toxicity concentration of 1 TUc. The absence of observable effects on test organisms in undiluted test

water corresponds to the Basin Plan narrative objective of 'no toxics in toxic amounts.' Therefore, a chronic toxicity concentration in excess of 1 TUc would not meet the Basin Plan narrative objective for toxicity.

27. Finding states the following:

FOCUS ON MAN-MADE POLLUTANTS AND FLOWS: The focus of this Order is on the control of urban runoff pollutants and flows which are either generated or accelerated by human activities. This Order is not meant to control background or naturally occurring pollutants and flows.

Discussion: In general, man-made pollutants and flows are the cause of receiving water impairment resulting from urban runoff. This is because human activities increase the concentrations of constituents above natural or background levels. Flow volumes and rates are also increased above background levels due to human activities, in both wet and dry weather. The focus of Order No. 2001-01 is therefore placed man-made pollutants and flows. Man-made pollutants and flows are also focused on due to our ability to control them. In comparison with naturally occurring pollutants and flows, man-made pollutants and flows are significantly easier to control. The SDRWQCB has discretion to require control of flows under a United States Supreme Court decision, which held that regulation of flow to protect beneficial uses is within the authority of the Clean Water Act (PUD No. 1 v. WA Dept. of Ecology, 511 U.S. 700 (1994)).

28. Finding states the following:

COMMON WATERSHEDS AND CWA SECTION 303(d) IMPAIRED WATERS: The Copermittees discharge urban runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within ten of the eleven hydrologic units (watersheds) comprising the San Diego Region as shown in Table 2 below. During its downstream course, urban runoff is conveyed through lined and unlined (natural, manmade, and partially modified) channels, all of which are defined as components of the Copermittees' MS4.

Some of the receiving water bodies, which receive or convey urban runoff discharges, have been designated as impaired by the SDRWQCB and USEPA in 1998 pursuant to Clean Water Act section 303(d). Also shown below are the watershed management areas (WMAs) as defined in the SDRWQCB report, Watershed Management Approach, January 2000.

Table 2. Watershed Management Areas (WMAs)

SDRWQCB WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT	COPERMITTEES
Santa Margarita River	Santa Margarita (902.00)	Santa Margarita River and Estuary, Pacific Ocean	1. Coliform Bacteria 2. Nutrients	1. County of San Diego
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River and Estuary, Pacific Ocean	1. Coliform Bacteria 2. Nutrients	1. City of Escondido 2. City of Oceanside 3. City of Vista 4. County of San Diego
Carlsbad	Carlsbad (904.00)	Batiquitos Lagoon	1. Coliform Bacteria	1. City of Carlsbad

SDRWQCB WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT	COPERMITTEES
		San Elijo Lagoon *Agua Hedionda Lagoon* *Buena Vista Lagoon* *And Tributary Streams* *Pacific Ocean*	*2. Nutrients* *3. Sediment*	*2. City of Encinitas* *3. City of Escondido* *4. City of Oceanside* *5. City of San Marcos* *6. City of Solana Beach* *7. City of Vista* *8. County of San Diego*
San Dieguito River	*San Dieguito (905.00)*	*San Dieguito River and Estuary, Pacific Ocean*	*1. Coliform Bacteria*	*1. City of Del Mar* *2. City of Escondido* *3. City of Poway* *4. City of San Diego* *5. City of Solana Beach* *6. County of San Diego*
Mission Bay	*Peñasquitos (906.00)*	*Los Peñasquitos Lagoon* *Mission Bay, Pacific Ocean*	*1. Coliform Bacteria* *2. Metals* *3. Nutrients* *4. Sediment*	*1. City of Del Mar* *2. City of Poway* *3. City of San Diego* *4. County of San Diego*
San Diego River	*San Diego (907.00)*	*San Diego River, Pacific Ocean*	*1. Coliform Bacteria*	*1. City of El Cajon* *2. City of La Mesa* *3. City of Poway* *4. City of San Diego* *5. City of Santee* *6. County of San Diego*
San Diego Bay	*Pueblo San Diego (908.00)* *Sweetwater (909.00)* *Otay (910.00)*	*San Diego Bay* *Sweetwater River* *Otay River* *Pacific Ocean*	*1. Coliform Bacteria* *2. Metals* *3. Toxicity* *4. Benthic Community Degradation*	*1. City of Chula Vista* *2. City of Coronado* *3. City of El Cajon* *4. City of Imperial Beach* *5. City of La Mesa* *6. City of Lemon Grove* *7. City of National City* *8. City of San Diego* *9. County of San Diego* *10. San Diego Unified Port District*
Tijuana River	*Tijuana (911.00)*	*Tijuana River and Estuary* *Pacific Ocean*	*1. Coliform Bacteria* *2. Low Dissolved Oxygen* *3. Metals* *4. Nutrients* *5. Pesticides* *6. Synthetic Organics* *7. Total Dissolved Solids* *8. Trash*	*1. City of Imperial Beach* *2. City of San Diego* *3. County of San Diego*

Discussion: The 1998 California 303(d) List and TMDL Priority Schedule identifies impaired receiving water bodies and their watersheds within the State of California. The Copermittees which discharge from Ms4s to these water bodies are identified in the Regional Board *Draft Watershed Management Approach*.[81] For an explanation on how the watershed approach fits into the NPDES municipal storm water permitting program, see Attachment 4, Municipal Storm Water Permitting and the Watershed Approach.

[81] SDRWQCB. 1999. Fifth Draft Watershed Management Approach for the San Diego Region.

29. Finding states the following:

CUMULATIVE POLLUTANT LOAD CONTRIBUTIONS: Because they are interconnected, each MS4 within a watershed contributes to the cumulative pollutant loading, volume, and velocity of urban runoff and the ensuing degradation of the downstream receiving water bodies. Accordingly, inland MS4s contribute to coastal impairments.

Discussion: A watershed is the drainage basin, outlined by topographic divides, which drain to a common outlet, such as a stream, lake, estuary, enclosed bay, or ocean. Therefore, when various MS4s discharge into the same watershed, the discharges eventually flow into a common receiving water body. In this manner, individual MS4s which share the same watershed contribute to cumulative pollutant loading in the watershed's receiving water body. To help alleviate this cumulative loading, watershed based water quality protection is needed. The SWRCB Urban Runoff Technical Advisory Committee defines watershed based water quality protection as "the prevention/control of pollution and management of human activities within a geographically or other defined drainage area to protect, restore, and/or enhance the natural resources and beneficial uses within the watershed."

30. Finding states the following:

LAND USE PLANNING ON A WATERSHED SCALE: Because urban runoff does not recognize political boundaries, "watershed-based" land use planning (pursued collaboratively by neighboring local governments) can greatly enhance the protection of shared natural water resources. Such planning enables multiple jurisdictions to work together to plan for both development and resource conservation that can be environmentally as well as economically sustainable.

Discussion: Conventional planning and zoning can be limited in their ability to protect the environmental quality of creeks, rivers, and other waterbodies. Watershed-based planning is often ignored, despite the fact that receiving waters unite land by collecting runoff from throughout the watershed. Since watersheds unite land, they can be used as an effective basis for planning. Watershed-based planning enables local and regional areas to realize economic, social, and other benefits associated with growth, while conserving the resources needed to sustain such growth, including water quality. This type of planning can involve four steps: (1) Identify the watersheds shared by the participating jurisdictions; (2) Identify, assess, and prioritize the natural, social, and other resources in the watersheds; (3) Prioritize areas for growth, protection, and conservation, based on prioritized resources; and (4) Develop plans and regulations to guide growth and protect resources. Local governments can start with simple, yet effective, steps toward watershed planning, such as adopting a watershed-based planning approach, articulating the basic strategy in their General Plans, and beginning to pursue the basic strategy in collaboration with neighboring local governments who share the watersheds. New mechanisms have been

created to facilitate watershed-based planning and zoning, such as the San Francisquito Creek Watershed Coordinated Resource Management Process and the Santa Clara Basin Watershed Management Initiative.[82]

31. Finding states the following:

INTERGOVERNMENTAL COORDINATION: Within their common watersheds it is essential for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially Caltrans and the Department of Defense, is also critical.

Establishment of a management structure, within which the Copermittees subject to this Order, will fund and coordinate those aspects of their joint obligations will promote implementation of Urban Runoff Management Programs on a watershed and regional basis in the most cost effective manner.

Discussion: Within a given watershed, "water quality and beneficial uses may be affected by many different activities – which may occur throughout or only in certain parts of watersheds, and which may occur near to or far from locations of known water problems" (SDRWQCB,1999). This implies that pollutant sources may actually be located far from where the water quality problem manifests itself. Therefore, water quality problems generated by one municipality may impact another municipality. In addition, municipalities within a watershed all contribute pollutants to shared receiving waters. For these reasons, coordination between municipalities and stakeholders within a watershed is necessary. Watershed scale coordination provides for the highest priority water quality problems to be addressed, resulting in the greatest improvements in water quality for costs incurred. Intergovernmental coordination can also result in cost savings through the sharing of resources between Copermittees.

Also, federal NPDES regulation 40 CFR 122.26(d)(2)(iv) requires where necessary intergovernmental coordination by stating "a proposed management program covers the duration of the permit. It shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate." In addition, the US EPA finds that "[Copermittees] may use jurisdictional agreements to show adequate legal authority and to ensure planning, coordination, and the sharing of the resource burden of permit compliance" (1992).

32. Finding states the following:

[82] Source: Bay Area Stormwater Management Agencies Association. 1999. Start at the Source. Forbes Custom Publishing.

WASTE REMOVAL: Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the United States unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. Once removed, such accumulated wastes must be characterized and lawfully disposed.

Discussion: When rain falls and drains urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. Gravity flow transports the pollutants to the MS4. Illicit discharges and connections also contribute a significant amount of pollutants to MS4s. MS4s are commonly designed to convey their contents as quickly as possible. Due to these typically high flow rates within the concrete conveyance systems of MS4s, pollutants which enter or are deposited in the MS4 and not removed are generally flushed unimpeded through the MS4 to waters of the United States. The US EPA found in its National Urban Runoff Pollution study (1983) that pollutant concentrations in urban runoff discharged from MS4s frequently exceed established receiving water quality objectives and drinking water standards. Therefore, when waste is deposited in the MS4, it is generally flushed to receiving waters, when it can potentially cause or contribute to a violation of water quality standards.

33. Finding states the following:

TOXIC HOT SPOTS: Urban runoff is a significant contributor to the creation and persistence of Toxic Hot Spots in San Diego Bay. California Water Code section 13395 requires regional boards to reevaluate waste discharge requirements (WDRs) associated with toxic hot spots. The State Water Resources Control Board (SWRCB) adopted the Consolidated Toxic Hot Spot Cleanup Plan in June 1999. The Plan states: "The reevaluation [of WDRs associated with toxic hot spots] shall consist of (1) an assessment of the WDRs that may influence the creation or further pollution of the known toxic hot spot, (2) an assessment of which WDRs need to be modified to improve environmental conditions at the known toxic hot spot, and (3) a schedule for completion of any WDR modifications deemed appropriate."

Discussion: Toxic hot spots are those areas in enclosed bays, estuaries, or any adjacent waters in the "contiguous zone" or the "ocean", where pollution or contamination affects the interests of the state, and where hazardous substances have accumulated to levels which: 1) may pose a substantial present or potential hazard to aquatic life, wildlife, fisheries, or human health, or 2) may adversely affect the beneficial uses of the bay, estuary, or ocean waters, or 3) exceeds adopted water quality or sediment quality objectives. San Diego Bay contains several toxic hot spots. In a National Oceanic and Atmospheric Administration (NOAA) study which compared EMAP-type sediment toxicity data from various bays, San Diego Bay ranked second with 56 percent of the area of the Bay considered toxic. For these reasons, Order No. 2001-01 includes directives to prevent urban runoff from contributing to the further degradation of toxic hot spots.

34. Finding states the following:

CHANGING THE STORM WATER MANAGEMENT APPROACH: In contrast to the conventional "conveyance" approach, a more natural approach to storm water management seeks to filter and infiltrate runoff by allowing it to flow slowly over permeable vegetated surfaces. By "preserving and restoring the natural hydrologic cycle", filtration and infiltration can greatly reduce the volume/peak rate, velocity, and pollutant loads of urban runoff. The greatest opportunities for changing from a "conveyance" to a more natural management approach occur during the land use planning and zoning processes and when new development projects are under early design.

Discussion: Urbanization generally results in an increase in pollutant sources and impervious surfaces. The increase in pollutant sources leads to an increase in pollutant loads found in storm water, while the increase in impervious surfaces prevents natural processes from reducing those pollutant loads. The impervious surfaces associated with urbanization and its storm water conveyance systems prevent storm water from infiltrating into the soil. Natural vegetation and soil are prevented from filtering urban runoff, resulting in storm water flows that are higher in volume and pollutant loads. This causes the quality of receiving waters to be adversely impacted and beneficial uses to be impaired.

Studies have revealed that the level of imperviousness resulting from urbanization is strongly correlated with the water quality impairment of nearby receiving waters.[83] Urbanization creates new sources of pollutants and provides for their rapid transport to receiving waters through storm water conveyance systems. Urbanization also adversely impacts receiving waters through changes it causes to local hydrology. Increases in population density and imperviousness stemming from urbanization result in changes to stream hydrology, including:

1. increased peak discharges compared to predevelopment levels;
2. increased volume of storm water runoff with each storm compared to pre- development levels;
3. decreased travel time to reach receiving water;
4. increased frequency and severity of floods;
5. increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from channelization; and
6. decreased infiltration and diminished groundwater recharge.

In many cases the impacts on receiving waters due to changes in hydrology can be more significant than those attributable to the contaminants found in storm water discharges (USEPA, 1999b). These impacts include stream bank erosion (increased sediment load and subsequent deposition), benthic habitat degradation, and decreased diversity of macroinvertebrates.

For the above reasons, this Order encourages an approach to storm water management which seeks to preserve and restore the natural hydrologic cycle. Open space designs which maximize pervious surfaces and retention of "natural" drainages have been found to reduce both the costs of

[83] U.S. Environmental Protection Agency. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.

development and pollutant export.[84] Moreover, US EPA finds including plans for a "natural" site design and BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce pollutant loads to surface waters.[85]

35. Finding states the following:

INFILTRATION AND POTENTIAL GROUNDWATER CONTAMINATION: Any drainage feature that infiltrates runoff poses some risk of potential groundwater contamination. Although dependent on several factors, the risks typically associated with the infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; and (3) ensuring that each drainage feature is adequately maintained in perpetuity. Minimum conditions needed to protect groundwater are specified in section F.1.b. of this Order.

Discussion: Infiltration is an effective means for managing urban runoff. However, measures must be taken to protect groundwater quality when infiltration of urban runoff is implemented. US EPA supports urban runoff infiltration and provides guidance for protection of groundwater: "With a reasonable degree of site-specific design considerations to compensate for soil characteristics, infiltration may be very effective in controlling both urban runoff quality and quantity problems. This strategy encourages infiltration of urban runoff to replace the natural infiltration capacity lost through urbanization and to use the natural filtering and sorption capacity of soils to remove pollutants; however, the potential for some types of urban runoff to contaminate groundwater through infiltration requires some restrictions."[86] The restrictions placed on urban runoff infiltration in Order No. 2001-01 are based on recommendations provided by the US EPA Risk Reduction Engineering Laboratory. The SWRCB tentatively found in its draft order on the appeal of the Los Angeles Regional Water Quality Control Board's (LARWQCB's) Standard Urban Storm Water Mitigation Plan (SUSMP) requirements that the guidance provided in the above referenced document by the US EPA Risk Reduction Engineering Laboratory is sufficient for the protection of groundwater quality from urban runoff infiltration. To further protect groundwater quality, Order No. 2001-01 also includes guidance from the LARWQCB,[87] the State of Washington,[88] and the State of Maryland.[89]

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[84] Center for Watershed Protection. 2000. "The Benefits of Better Site Design in Residential Subdivisions." Watershed Protection Techniques. Vol. 3. No. 2.

[85] U.S. Environmental Protection Agency. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.

[86] U.S. Environmental Protection Agency. 1994. Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration. EPA 600 SR-94 051.

[87] Guidance on vertical distance from base of BMP to groundwater table. LARWQCB. 2000. Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles County.

36. Finding states the following:

ANTIDEGRADATION: Conscientious implementation of URMPs that satisfy the requirements contained in this Order will reduce the likelihood that discharges from MS4s will cause or contribute to unreasonable degradation of the quality of receiving waters. Therefore, this Order is in conformance with SWRCB Resolution No. 68-16 and the federal antidegradation policy described in 40 CFR 131.12.

Discussion: Implementation of URMPs is required to reduce pollutants in urban runoff to the maximum extent practicable. Reduction of pollutants to the maximum extent practicable will prevent degradation of the quality of receiving waters. Therefore, implementation of URMPs which satisfy the requirements of Order No. 2001-01 will prevent violations of receiving water quality objectives. The Basin Plan states that "Water quality objectives must […] conform to US EPA regulations covering antidegradation (40 CFR 131.12) and State Board Resolution 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California." As a result, when water quality objectives are met through the implementation of URMPs, US EPA and SWRCB antidegradation policy requirements are also met.

37. Finding states the following:

CEQA: The issuance of waste discharge requirements for the discharge of urban runoff from MS4s to waters of the United States is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, § 21000 et seq.) in accordance with the CWC § 13389.

Discussion: CWC section 13389 provides that "Neither the state board nor the regional boards shall be required to comply with the provisions of Chapter 3 (commencing with section 21100) of Division 13 of the Public Resources Code prior to the adoption of any waste discharge requirement, except requirements for new sources as defined in the Federal Water Pollution Control Act or acts amendatory thereof or supplementary thereto."

38. Finding states the following:

PUBLIC NOTICE: The SDRWQCB has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of urban runoff.

Discussion: Public notification of development of a draft permit is required under Federal regulation 40 CFR 124.10(a)(1)(ii). This regulation states "(a) Scope. (1) The Director shall give public notice that the following actions

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88 Washington State Department of Ecology. 1999. Draft Stormwater Management in Washington State. Volume V – Runoff Treatment BMPs. Pub. No. 99-15.

89 Maryland Department of the Environment. 1999. 2000 Maryland Stormwater Design Manual. Volume I.

have occurred: (ii) A draft permit has been prepared under Sec. 124.6(d)." Public notifications "shall allow at least 30 days for public comment," as required under Federal regulation 40 CFR 124.10(b)(1).

39. Finding states the following:

PUBLIC HEARING: The SDRWQCB has, at a public meeting on December 13, 2000, held a public hearing and heard and considered all comments pertaining to the terms and conditions of this Order.

Discussion: Public hearings are required under California Water Code Section 13378, which states "Waste discharge requirements and dredged or fill material permits shall be adopted only after notice and any necessary hearing." Federal regulation 40 CFR 124.12(a)(1) also requires public hearings for draft permits, stating "The Director shall hold a public hearing whenever he or she finds, on the basis or requests, a significant degree of public interest in a draft permit(s)." Regarding public notice of a public hearing, Federal regulation 40 CFR 124.10(b)(2) states that "Public notice of a public hearing shall be given at least 30 days before the hearing."

VII. DIRECTIVES DISCUSSION

UNDERLYING BROAD LEGAL AUTHORITY FOR ORDER NO. 2001-01

The following statutes, regulations, and Water Quality Control Plans provided the basis for Order No. 2001-01: Clean Water Act, California Water Code, 40 CFR Parts 122, 123, 124 (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, Final Rule), Part II of 40 CFR Parts 9, 122, 123, and 124 (National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule), Water Quality Control Plan – Ocean Waters of California (California Ocean Plan), Water Quality Control Plan for the San Diego Basin (Basin Plan), 40 CFR 131 Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule (California Toxics Rule), and the California Toxics Rule Implementation Plan.

The following broad legal authority citations generally apply to all directives in Order No. 2001-01, and provide the SDRWQCB with ample underlying authority to require each of the directives.

CWA 402(p)(3)(B)(ii) – Prohibit Non-Storm Water
The CWA requires in section 402(p)(3)(B)(ii) that permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers."

CWA 402(p)(3)(B)(iii) – Reduce to MEP and Whatever Else is Needed

The CWA requires in section 402(p)(3)(B)(iii) that permits for discharges from municipal storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

40 CFR 122.26(d)(2)(i)(B,C,E, and F) – Obtain Adequate Legal Authority
Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) provide that each Copermitee's permit application "shall consist of : (i) Adequate legal authority. A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to: […] (B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; (C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water; […] (E) Require compliance with condition in ordinances, permits, contracts or orders; and (F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) – Reduce to the MEP and Whatever Else is Needed
Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) provides that the Copermittee shall develop and implement a proposed management program which "shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. […] Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. […] Proposed management programs shall describe priorities for implementing controls."

CWC 13377 – Implement Clean Water Act and Whatever Else is Needed
California Water Code section 13377 provides that "Notwithstanding any other provision of this division, the state board or the regional boards shall, as required or authorized by the Federal Water Pollution Control Act (Clean Water Act), as amended, issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with anymore stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

In addition to the five broad legal authority items cited above, which underlie all of the directives in Order No. 2001-01, additional specific legal authority citations applicable to particular directives of Order No. 2001-01 are provided in this Fact Sheet/Technical Report as necessary. Some of these additional specific legal authority citations apply to entire components of Order No. 2001-01. In this case, the specific legal authority quotations are provided at the beginning of the discussion of the permit component, while the legal authority is again cited under each directive of the component. Furthermore, some specific legal authority citations only apply to distinct directives of Order No. 2001-01. When this occurs, the quotation of the specific legal authority citation will appear with the discussion of the distinct permit directive.

A. PROHIBITIONS – DISCHARGES

A.1. Prohibitions – Discharges states the following:

> *Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC § 13050), in waters of the state are prohibited.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: The SDRWQCB Water Quality Control Plan for the San Diego Basin (Basin Plan) contains the following waste discharge prohibition: "The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in California Water Code Section 13050, is prohibited."

California Water Code section 13050(l) states"(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination."

California Water Code section 13050(k) states "'Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

California Water Code section 13050(m) states "'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood,

or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the SDRWQCB implement the Basin Plan.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges to their MS4.

Discussion: Prohibition item A.1. characterizes a basic premise and primary goal of Order No. 2001-01. The entire thrust of Order No. 2001-01 is to prevent discharges from MS4s from causing, or threatening to cause, a condition of pollution, contamination, or nuisance. In fact, Prohibition item A.1. exhibits a major component of the SDRWQCB's mission, and is included in its Basin Plan. The SDRWQCB seeks to preserve and enhance the quality of the region's waters, and one primary method to achieve this is by preventing conditions of pollution, contamination, or nuisance in the region's waters. As discussed in Finding 9, urban runoff discharges from MS4s can cause these conditions. Therefore, Prohibition item A.1 is included in Order No. 2001-01 to prevent urban runoff discharges which may cause or threaten to cause conditions of pollution, contamination, or nuisance.

Since discharges which enter the MS4 are generally discharged unimpeded directly into receiving waters, this prohibition applies to both discharges into and from MS4s. Federal NPDES regulations clearly provide the SDRWQCB with the legal authority to require municipalities to control discharges from third parties into their MS4. 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff **from** commercial, residential, industrial, and construction land uses or activities. Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges **to** their MS4. This concept is further supported in the Preamble to the Phase II Final Rule NPDES storm water regulations, which states "The operators of regulated small MS4s cannot passively receive and discharge pollutants **from** third parties" (US EPA, 1999). Due to the greater water quality concerns generally experienced by larger municipalities, Phase II Final Rule findings

for small municipalities are also applicable to larger municipalities such as the Copermittees. Finally, underlying the Federal NPDES storm water regulations is the Clean Water Act, which states in section 402(p)(3)(B)(ii) that municipalities shall "effectively prohibit non-stormwater discharges **into** the storm sewers."

The requirement for municipal storm water dischargers to have, and exercise, local governmental authority in order to comply with water quality control obligations (such as Prohibition A.1 of Order No. 2001-01) is analogous to the requirement for Publicly Owned Treatment Works to have and exercise legal authority to require pretreatment of industrial wastes being discharged to their sewage collections systems (CWA 402(b)(8)).

The SDRWQCB has discretion to require Prohibition item A.1. in Order No. 2001-01 under the broad and specific legal authority cited above.

A.2. Prohibitions – Discharges states the following:

Discharges from MS4s which cause or contribute to exceedances of receiving water quality objectives for surface water or groundwater are prohibited.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

California Water Code section 13241 requires each regional board to "establish such water quality objectives in water quality control plans as in its judgement will ensure the reasonable protection of beneficial uses and the prevention of nuisance […]."

California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the SDRWQCB implement the Basin Plan.

Discussion: As with Prohibition item A.1., Prohibition item A.2. also characterizes a primary goal of Order No. 2001-01 and the SDRWQCB. This goal is to protect the beneficial uses of the region's waters and achieve the water quality objectives necessary to protect those uses. The overarching intent of the Clean Water Act embodies Prohibition item A.2. as well; the Act's objective is to "restore and maintain all chemical, physical and biological integrity of the Nation's waters [to make all surface waters] fishable [and] swimmable."

As discussed in Finding 3, urban runoff discharges from MS4s can cause or contribute to exceedances of receiving water quality objectives. For this reason, there is a real need for municipal storm water permits to include stringent requirements such as Prohibition item A.2. to protect those water bodies. To meet this need the SDRWQCB has included receiving water limitations, which dictate water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses), in Receiving Water Limitations item C. of Order No. 2001-01 (see the Discussion for this item for more information). To ensure that water quality standards are protected and receiving water limitations met, the SDRWQCB must prohibit MS4 discharges that cause or contribute to exceedances of receiving water quality objectives.

The SDRWQCB has discretion to require Prohibition item A.2. in Order No. 2001-01 under the broad and specific legal authority cited above.

A.3. Prohibitions – Discharges states the following:

Discharges from MS4s to waters of the United States containing pollutants which have not been reduced to the maximum extent practicable (MEP) are prohibited.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

Discussion: As discussed in Findings 3 and 9, urban runoff discharges from MS4s can cause receiving water degradation and beneficial use impairment. For this reason, pollutants in these discharges must be reduced to the maximum extent practicable (see Finding 10). The Clean Water Act and Federal NPDES regulations clearly require operators of MS4s to reduce pollutants in discharges from MS4s to the maximum extent practicable. Therefore, the SDRWQCB has prohibited discharges which do not meet this requirement. The SDRWQCB has discretion to require Prohibition item A.3. in Order No. 2001-01 under the broad and specific legal authority cited above.

A.4. Prohibitions – Discharges states the following:

> *Applicable to New Development and Significant Redevelopment Only:*
> *Post-development runoff which is greater in peak rate or velocity than pre-development runoff from the same site is prohibited. Post-development runoff containing pollutants loads which cause or contribute to an exceedance of receiving water quality objectives or which have not been reduced to the maximum extent practicable is prohibited. Discharges of post-development runoff into a Clean Water Act section 303(d) water body containing any pollutant (for which the water body is already impaired) in levels exceeding predevelopment levels (for those same pollutants) is prohibited.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

Discussion: In order to prevent receiving water quality problems within the region from worsening, urban runoff from new development must be addressed. This is because the increased urbanization associated with new development generally results in an increase in pollutant sources and impervious surfaces. The increase in pollutant sources leads to an increase in pollutant loads found in storm water, while the increase in impervious surfaces prevents natural processes from reducing those pollutant loads. The impervious surfaces associated with urbanization prevent storm water from infiltrating into the soil. Natural vegetation and soil are prevented from filtering urban runoff, resulting in storm water flows that are higher in volume and pollutant loads. This causes the quality of receiving waters to be adversely impacted and beneficial uses to be impaired.

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality." The term "water quality standards" in this context refers to a water body's **beneficial uses** and the water quality objectives necessary to protect those beneficial uses. The negative impact of urban runoff flow on the beneficial uses of receiving waters has been widely documented. Increases in flows from impervious surfaces associated with urbanization can result in (1) increases in the number of bankfull events and increased peak flow rates; (2) sedimentation and increased sediment transport; (3) frequent flooding; (4) stream bed scouring and habitat degradation; (5) shoreline erosion and stream bank widening; (6) decreased baseflow; (7) loss of fish populations and loss of sensitive aquatic species; (8) aesthetic degradation; and (9) changes in stream morphology.[90] US EPA finds that the level of imperviousness resulting from urbanization is strongly correlated with the water quality impairment of nearby receiving waters.[91] US EPA further attributes much of this water quality impairment to changes in flow conditions from urbanization, stating "[I]n many cases, the impacts on receiving streams due to high storm water flow rates or volumes can be more significant than those attributable to the contaminants found in storm water discharges."[92] Therefore, in order to protect the beneficial uses and water quality objectives of waters receiving urban runoff flows from new development (as **required** by 40 CFR 122.44(d)(1)), the SDRWQCB has placed limits on urban runoff flows from new development in the Prohibition A.4.

While new development increases urban runoff flows, it also increases the amount of pollutants found in those flows. Urban runoff was found by the 1996 US EPA National Water Quality Inventory to be the leading cause of ocean impairment nationwide. As regional monitoring program results indicate, urban runoff is also identified as a primary source of receiving water quality impairment within the Region. Though urban land use occupies approximately 30% of the monitoring program study area, approximately 50% or more of the total pollutant load for many constituents is contributed by urbanized land uses including residential, commercial, and industrial land uses (City of San Diego, 1998). The Region's Clean Water Act Section 303(d) list, which identifies water bodies with impaired beneficial uses within the Region, also indicates that the impacts of urban runoff are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents which have been found at high levels within urban runoff by the regional storm water monitoring program. Examples of constituents frequently responsible for beneficial use impairment include total

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

[91] U.S. Environmental Protection Agency. 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. p. 68727.

[92] U.S. Environmental Protection Agency. 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA-821-R-99-012. p. 4-23.

and fecal coliform, heavy metals, and sediment; these constituents have been found at high levels in urban runoff both regionally and nationwide.

Urban runoff clearly has a significant impact on receiving water quality within the region. Without proper controls, new development only exacerbates the problem. To keep the problem from worsening, and to prevent the further degradation of impaired receiving waters (as required by Federal NPDES regulation 40 CFR 122.44 (d)(1)(i)), Prohibition A.4 places limits on the discharge of pollutants from new development.

The SDRWQCB has discretion to require Prohibition item A.4. in Order No. 2001-01 under the broad and specific legal authority cited above.

A.5. Prohibitions – Discharges states the following:

In addition to the above prohibitions, discharges from MS4s are subject to all Basin Plan prohibitions cited in Attachment A to this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the SDRWQCB implement the Basin Plan.

Discussion: As discussed in Findings 3, 6, and 9, the discharge of pollutants from MS4s can cause the concentration of pollutants to exceed applicable receiving water quality objectives, impair or threaten to impair designated beneficial uses, and pose a significant threat to the public health. To prevent these conditions, the Prohibitions included in the SDRWQCB's Basin Plan must therefore apply to MS4 discharges. The Basin Plan contains Prohibitions established by the SDRWQCB pursuant to California Water Code Section 13243. The SDRWQCB is required to implement Basin Plan Prohibitions in Order No. 2001-01 pursuant to California Water Code Section 13263(a). The SDRWQCB has discretion to require Prohibition item A.5. in Order No. 2001-01 under the broad and specific legal authority cited above.

B.1. Prohibitions – Non-Storm Water Discharges states the following:

*Each Copermittee shall effectively prohibit **all** types of non-storm water discharges into its Municipal Separate Storm Sewer System (MS4) unless such discharges are either authorized by a separate NPDES permit; or not prohibited in accordance with B.2. and B.3. below.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittees shall prevent all types of illicit discharges into the MS4 except for the non-storm water discharges listed in Prohibition item B.2., provided that these discharges are not found to be a significant source of pollutants.

Discussion: Illicit or non-storm water discharges can constitute a significant portion of urban runoff discharges from MS4s. US EPA states "A study conducted in 1987 in Sacramento, California, found that almost one-half of the water discharged from a local MS4 was not directly attributable to precipitation runoff. A significant portion of these dry weather flows were from illicit and/or inappropriate discharges and connections to the MS4" (2000).

MS4 discharges attributable to illicit or non-storm water discharges can be a significant source of pollutant loading to receiving waters. The NURP study concluded that the quality of urban runoff can be adversely impacted by illicit discharges and connections (US EPA, 1983). Furthermore, US EPA states that illicit or non-storm water discharges result in "untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic wildlife and human health" (2000).

For these reasons, CWA section 402(p)(3)(B)(ii) requires each Copermittee to prohibit non-storm water discharges into its MS4. The detection and elimination of illicit discharges and connections is also clearly identified in the federal regulations as a high priority (40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1)). As guidance for detecting and eliminating illicit discharges and connections, the US EPA suggests "The proposed management program must include a description of inspection procedures, orders, ordinances, and other legal authorities necessary to prevent illicit discharges to the MS4" (1992).

The SDRWQCB has the discretion to require Prohibition item B.1. in Order 2001-01 under the broad and specific legal authority cited above.

B.2. Prohibitions – Non-Storm Water Discharges states the following:

Pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1), the following categories of non-storm water discharges need only be prohibited from entering an MS4 if such categories of discharges are identified by the Copermittee as a significant source of pollutants to waters of the United States:

a. *Diverted stream flows;*
b. *Rising ground waters;*
c. *Uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to MS4s;*
d. *Uncontaminated pumped ground water;*
e. *Foundation drains;*
f. *Springs;*
g. *Water from crawl space pumps;*
h. *Footing drains;*
i. *Air conditioning condensation;*
j. *Flows from riparian habitats and wetlands;*
k. *Water line flushing;*
l. *Landscape irrigation;*
m. *Discharges from potable water sources;*
n. *Irrigation water;*
o. *Lawn watering;*
p. *Individual residential car washing; and*
q. *Dechlorinated swimming pool discharges.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittees shall prevent all types of illicit discharges into the MS4 except for the non-storm water discharges listed in Prohibition item B.2., provided that these discharges are not found to be a significant source of pollutants.

Discussion: The discharges listed in Prohibition item B.2. are referred to as "de minimis" discharges in the Federal NPDES regulations. They are considered acceptable non-storm water discharges to the MS4 only when found by the municipality to not be a significant source of pollutants to the MS4 (40 CFR 122.26(d)(2)(iv)(B)(1)). Regarding these discharges, US EPA states "While EPA does not consider these flows to be innocuous, they are only to be regulated by the storm water program to the extent that they may be identified as significant sources of pollutants to waters of the United States under certain circumstances" (1992). The SDRWQCB has discretion to require Prohibition item B.2. in Order No. 2001-01 under the broad and specific legal authority cited above.

B.3. Prohibitions – Non-Storm Water Discharges states the following:

When a discharge category above is identified as a significant source of pollutants to waters of the United States, the Copermittee shall either:

*a. Prohibit the discharge category from entering its MS4; **OR***

*b. Not prohibit the discharge category and implement, or require the responsible party(ies) to implement, BMPs which will reduce pollutants to the MEP; **AND***

c. For each discharge or discharge class not prohibited, the Copermittee shall submit the following information to the SDRWQCB within 180 days of adoption of this Order:

(1) The non-storm water discharge category listed above which the Copermittee elects not to prohibit; and

(2) The BMP(s) for each discharge class listed above which the Copermittee will implement, or require the responsible party(ies) to implement, to prevent or reduce pollutants to the MEP.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittees shall prevent all types of illicit discharges into the MS4 except for the non-storm water discharges listed in Prohibition item B.2., provided that these discharges are not found to be a significant source of pollutants.

California Water Code Section 13267 provides that "the regional board may require that any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Discussion: Discharges listed in Prohibition item B.2. which are found to be significant sources of pollutants cannot be discharged to the MS4 without implementation of applicable control measures. These control measures can include prohibition of the discharges or implementation of BMPs to reduce pollutants in the discharges to the maximum extent practicable. If a municipality chooses not to prohibit such a discharge, the municipality must supply the SDRWQCB information assuring that pollutants in the discharges will be reduced to the maximum extent practicable. This will help ensure that the municipality has a plan in place to address the discharges, thereby reducing the potential for the discharges to impact receiving water quality. The SDRWQCB has discretion to require Prohibition item B.3. in Order No. 2001-01 under the broad and specific legal authority cited above.

B.4. Prohibitions – Non-Storm Water Discharges states the following:

> ***Fire Fighting Flows:*** *BMPs must be implemented to reduce pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes) identified by the Copermittee to be significant sources of pollutants to waters of the United States. Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) need not be prohibited.*
>
> Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).
>
> Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."
>
> Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that Copermittees "shall address discharges or flows from fire fighting only where such discharges or flows are identified as significant sources of pollutants to waters of the United States."
>
> Discussion: Discharges or flows from non-emergency fire fighting can be a significant source of pollutants to the MS4. Pollutants which enter the MS4 are generally flushed out to receiving waters. Discharges or flows from non-emergency fire fighting activities can therefore negatively impact receiving water quality. For this reason, non-emergency fire fighting discharges and flows must be addressed when identified as significant sources of pollutants. The SDRWQCB has discretion to require Prohibition item B.4. in Order No. 2001-01 under the broad and specific legal authority cited above.

B.5. Prohibitions – Non-Storm Water Discharges states the following:

> *Dry Weather Analytical Monitoring and Non-Storm Water Discharges: Each Copermittee shall examine all dry weather analytical monitoring results collected in accordance with section F.5. and Attachment E of this Order to identify water quality problems which may be the result of any non-prohibited discharge category(ies) identified above in Non-Storm Water Discharges to MS4s Prohibition B.2. Follow-up investigations shall be conducted as necessary to identify and control any non-prohibited discharge category(ies) listed above. Non-prohibited discharges listed in B.2. above which contain pollutants which cannot be reduced to the maximum extent practicable by the implementation of BMPs shall be prohibited on a categorical or case by case basis.*
>
> Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) requires that Copermittees shall provide "A description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) provides that Copermittees shall "investigate portions of the separate storm sewer system that, based on the results of a field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources on non-storm water."

Discussion: Non-prohibited non-storm water discharges can be a significant source of pollutants to the MS4. These discharges can reach receiving waters, causing negative impacts to receiving water quality. Field screening can be an effective tool to help prevent these conditions. Field screening results can be used to identify non-prohibited discharges which may be a significant source of pollutants to the MS4. When field screening results exhibit potential non-storm water discharges, follow-up investigations should be conducted to find if non-prohibited discharges are the source. This information can then be used to prohibit the non-prohibited discharge or require implementation of BMPs. The SDRWQCB has discretion to require Prohibition item B.5. in Order No. 2001-01 under the broad and specific legal authority cited above.

C. RECEIVING WATER LIMITATIONS

C. Receiving Water Limitation states the following:

1. *Discharges 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.*

2. *Each Copermittee shall comply with Part C.1. of this Order through timely implementation of control measures and other actions to reduce pollutants in urban runoff discharges in accordance with the Jurisdictional Urban Runoff Management Program (Jurisdictional URMP) and other requirements of this Order including any modifications. The Jurisdictional URMP shall be designed to achieve compliance with Part C.1. of this Order. If exceedance(s) of water quality standards persist notwithstanding implementation of the URMP and other requirements of this Order, the Copermittee shall assure compliance with Part C.1. of this Order by complying with the following procedure:*

    a. *Upon a determination by either the Copermittee or the SDRWQCB that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the SDRWQCB that describes BMPs that are currently being implemented and additional*

BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional URMP unless the SDRWQCB directs an earlier submittal. The report shall include an implementation schedule. The SDRWQCB may require modifications to the report;

b. Submit any modifications to the report required by the SDRWQCB within 30 days of notification;

c. Within 30 days following approval of the report described above by the SDRWQCB, the Copermittee shall revise its Jurisdictional URMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required;

d. Implement the revised Jurisdictional URMP and monitoring program in accordance with the approved schedule.

So long as the Copermittee has complied with the procedures set forth above and are implementing the revised Jurisdictional URMP, the Copermittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the SDRWQCB to do so.

3. Nothing in this section shall prevent the SDRWQCB from enforcing any provision of this Order while the Copermittee prepares and implements the above report.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code Section 13241 provides that the "SDRWQCB shall establish such water quality objectives in water quality control plans as in its judgement will ensure the reasonable protection of beneficial uses and the prevention of nuisance."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the SDRWQCB implement the Basin Plan.

Discussion: See the above discussion of Finding 13 in section VI. of this Fact Sheet/Technical Report.

D. LEGAL AUTHORITY

D.1. Legal Authority states the following:

*Each Copermittee shall establish, maintain, and enforce adequate legal authority to control pollutant discharges **into** and **from** its MS4 through ordinance, statute, permit, contract or similar means. This legal authority must, at a minimum, authorize the Copermittee to:*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Copermittees shall develop and implement legal authority to "Control through ordinance, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that the Copermittees shall develop and implement legal authority to "Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Illicit discharge is defined under Federal NPDES regulation 40 CFR 122.26(b)(2) as "any discharge to a municipal separate storm sewer system that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from commercial, residential, industrial, and construction land uses or activities.

Discussion: As discussed in Finding 15, Copermittees cannot passively receive and discharge pollutants from third parties. As US EPA states, "The operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts 'title' for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges to the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties" (1999).

Discharges of pollutants to the MS4 must therefore be controlled, and an important means for a municipality to achieve this is through development of municipal legal authority. USEPA states "A crucial requirement of the NPDES storm water regulation is that a municipality must demonstrate that it has adequate legal authority to control the contribution of pollutants in storm water discharged to its MS4. […] In order to have an effective municipal storm water management program, a municipality must have adequate legal authority to control the contribution of pollutants to the MS4. […] 'Control,' in this context, means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4" (1992).

Since discharges which enter the MS4 are generally discharged unimpeded directly into receiving waters, the Copermittee's legal authority is to apply to both discharges into and from MS4s. Federal NPDES regulations clearly

provide the SDRWQCB with the legal authority to require municipalities to control discharges from third parties into their MS4. 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff **from** commercial, residential, industrial, and construction land uses or activities. Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges **to** their MS4. This concept is further supported in the Preamble to the Phase II Final Rule NPDES storm water regulations, which states "The operators of regulated small MS4s cannot passively receive and discharge pollutants **from** third parties" (US EPA, 1999). Due to the greater water quality concerns generally experienced by larger municipalities, Phase II Final Rule findings for small municipalities are also applicable to larger municipalities such as the Copermittees. Finally, underlying the Federal NPDES storm water regulations is the Clean Water Act, which states in section 402(p)(3)(B)(ii) that municipalities shall "effectively prohibit non-stormwater discharges **into** the storm sewers."

The requirement for municipal storm water dischargers to have, and exercise, local governmental authority in order to comply with water quality control obligations is analogous to the requirement for Publicly Owned Treatment Works to have and exercise legal authority to require pretreatment of industrial wastes being discharged to their sewage collections systems (CWA 402(b)(8)).

The SDRWQCB has discretion to require Legal Authority item D.1 in Order No. 2001-01 under the broad and specific legal authority cited above.

D.1.a. Legal Authority states the following:

*Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity **to** its MS4 and control the quality of runoff **from** industrial and construction sites. This requirement applies both to industrial and construction sites which have coverage under the statewide general industrial or construction storm water permits, as well as to those sites which do not. Grading ordinances shall be upgraded as necessary to comply with this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Copermittees shall develop and implement legal authority to "Control through ordinance, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for purposes of this subsection: […] (x) Construction activity including clearing, grading and excavation activities […]."

Discussion: Industrial and construction sites are frequently sources of pollutants such as hazardous materials or sediment. These pollutants are typically carried to MS4s by urban runoff. As discussed in Finding 32, pollutants in urban runoff which enter the MS4 are generally discharged from these structures into receiving waters, where they may cause or contribute to a condition of pollution. Pollutant discharges from industrial and construction sites to MS4s must therefore be controlled. As discussed in Finding 22, municipalities are responsible for discharges from industrial and construction sites to their MS4s (see also Discussion under Legal Authority item D.1). US EPA supports this when it states "To comply with its permit, a municipality must have the authority to hold dischargers accountable for their contributions to separate storm sewers" (1992).

A necessary means for controlling pollutant discharges from industrial and construction sites is the development and implementation of legal authority which addresses urban runoff from these sites. The Federal NPDES regulations clearly emphasize the development and implementation of legal authority for controlling pollutant discharges from industrial and construction sites in 40 CFR 122.26(d)(2)(i)(A) and 40 CFR 122.26(b)(14).

Ordinances, statutes, permits, or contracts can be used to develop legal authority. For example, grading ordinances should be upgraded to control pollutant discharges from construction sites. The US EPA suggests this, stating "All construction sites, regardless of size, must be addressed by the municipality. […] A description of the local erosion and sediment control law or ordinance is needed to satisfy this program requirement. The description should include information that links the enforcement of the law or ordinance to the legal authority of the applicant" (1992). The US EPA further states "a municipality, to satisfy its permit conditions, may need to impose additional requirements on discharges from permitted industrial facilities, as well as discharges from industrial facilities and construction sites not required to obtain permits. Therefore, a municipality should develop a mechanism to assure that all industrial facilities and construction sites that discharge to the MS4 know their obligation to comply with the applicable terms of the municipality's storm water ordinances" (1992).

The SDRWQCB has discretion to require Legal Authority item D.1.a in Order No. 2001-01 under the broad and specific legal authority cited above.

D.1.b. Legal Authority states the following:

*Prohibit **all** illicit discharges including but not limited to:*

(1) Sewage;

(2) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;

(3) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing;

(4) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc.;

(5) Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, commercial, and residential areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;

(6) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;

(7) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;

(8) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and

(9) *Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26 (b)(2) defines an illicit discharge as "any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."

California Water Code Section 13243 also provides that a "regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

Discussion: Illicit or non-storm water discharges can be a significant source of pollutants to the MS4. As discussed in Finding 32, pollutants which enter the MS4 are generally discharged to receiving waters, where they can impact receiving water quality. Illicit or non-storm water discharges must therefore be prohibited. In order to effectively prohibit illicit or non-storm water

discharges, legal authority addressing the discharges must be developed and implemented by each Copermittee. The SDRWQCB has discretion to require Legal Authority item D.1.b in Order No. 2001-01 under the broad and specific legal authority cited above.

D.1.c. Legal Authority states the following:

Prohibit and eliminate illicit connections to the MS4;

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(b)(2) defines an illicit discharge as "any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."

California Water Code Section 13243 also provides that a "regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

Discussion: An illicit connection is a connection to the MS4 which carries illicit discharges to the MS4. Because illicit discharges to the MS4 are prohibited (discussed in section D.1.b. Legal Authority above), illicit connections are also prohibited and must be eliminated. In order to effectively prohibit and eliminate illicit connections, legal authority addressing the discharges must be developed and implemented by each Copermittee. The SDRWQCB has discretion to require Legal Authority item D.1.c in Order No. 2001-01 under the broad and specific legal authority cited above.

D.1.d. Legal Authority states the following:

Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code Section 13243 also provides that a "regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

Discussion: Non-storm water discharges such as spills, dumping, and disposal of materials can be a significant source of pollutants to the MS4. As discussed in Finding 32, pollutants deposited in MS4s most likely will be discharged to receiving waters, where they can impact receiving water quality. Non-storm water discharges such as spills, dumping, or disposal of materials must therefore be prohibited. In order to effectively prohibit these non-storm water discharges, legal authority addressing the discharges must be developed and implemented by each Copermittee. The SDRWQCB has discretion to require Legal Authority item D.1.d in Order 2001-01 under the broad and specific legal authority cited above.

D.1.e. and D.1.f. Legal Authority state the following:

Require compliance with conditions in Copermittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);

Utilize enforcement mechanisms to require compliance with Copermittee storm water ordinances, permits, contracts, or orders;

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Discussion: As discussed in Finding 15, the Copermittees cannot passively receive and discharge pollutants from third parties. Each Copermittee must implement ordinances, permits, contracts, and orders to hold discharges to MS4s accountable for their contributions of pollutants. In order for the ordinances to be effective, each Copermittee must be able to require compliance with the ordinances. Lack of ordinance enforcement by a Copermittee allows third parties to violate a municipality's ordinances with little fear of retribution, leading to receiving water quality degradation. US EPA recommends that a municipality in its urban runoff management program "identify the administrative and legal procedures available to mandate compliance with appropriate ordinances, and therefore, with permit conditions. [Programs] should contain descriptions of how ordinances are implemented and appealed. In particular, a municipality should indicate if it can issues administrative orders and injunctions or if it must go through the court system for enforcement actions" (1992). The SDRWQCB has discretion to require Legal Authority item D.1.e in Order No. 2001-01 under the broad and specific legal authority cited above.

D.1.g. Legal Authority states the following:

Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees (and other owners of the MS4 such as Caltrans or Department of Defense);

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that the Copermittee must demonstrate that it can control "through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Discussion: Discharges from Copermittees which share an MS4 eventually reach the same receiving water body. Each Copermittee which discharges to the shared MS4 is therefore responsible for discharges from the shared MS4, and the impacts of those discharges on receiving waters. The Copermittees of a shared MS4 must demonstrate that together they can control the contribution of pollutants over the whole shared MS4. To this effect, the US EPA states "When two or more municipalities submit a joint application, each coapplicant must demonstrate that it individually possesses adequate legal authority over the entire municipal system it operates and owns. A coapplicant need not fulfill every component of legal authority specified in the regulations, as long as the combined legal authority of all coapplicants satisfies the regulatory criteria for every segment of the MS4 (including authority over all sources that discharge to the MS4). […] Coapplicants also may use interjurisdictional agreements to show legal authority and to ensure planning, coordination, and the sharing of the resource burden of permit compliance" (1992). The SDRWQCB has discretion to require Legal Authority item D.1.g. in Order No. 2001-01 under the broad and specific legal authority cited above.

D.1.h. Legal Authority states the following:

Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits and with this Order, including the prohibition on illicit discharges to the MS4. This means the Copermittee must have authority to enter, sample, inspect, review and copy records, and require regular reports from industrial facilities discharging into its MS4, including construction sites; and

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Discussion: The Copermittees' ability to determine compliance and noncompliance with permit conditions is critical to control pollutant discharges to and from MS4s. Determination of compliance and noncompliance allows for significant sources of pollutants to be identified and addressed, thereby minimizing the discharge of pollutants from the MS4 and the resulting receiving water quality degradation. For this reason each Copermittee must have legal authority to carry out the inspections,

surveillance, and monitoring necessary to assess compliance. Regarding compliance determination, US EPA states "municipalities should provide documentation of their authority to enter, sample, inspect, review, and copy records, etc., as well as demonstrate their authority to require regular reports" (1992). The SDRWQCB has discretion to require Legal Authority item D.1.g in Order No. 2001-01 under the broad legal authority cited above.

D.1.i. Legal Authority states the following:

Require the use of best management practices (BMPs) to prevent or reduce the discharge of pollutants to MS4s.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(1)(ii) requires from the Copermittee "A description of existing legal authority to control discharges to the municipal separate storm sewer system."

Discussion: As discussed in Finding 15, the Copermittees cannot passively receive and discharge pollutants from third parties. The Copermittees must ensure discharges of pollutants to the MS4 are reduced to the maximum extent practicable. In order to achieve this, and hold third party dischargers responsible for their contributions of pollutants, the Copermittees must require the use of BMPs by third party dischargers (see Discussion under Legal Authority item D.1). The SDRWQCB has discretion to require Legal Authority item D.1.i in Order 2001-01 under the broad and specific legal authority cited above.

D.2. Legal Authority states the following:

Within 90 days of adoption of this Order, each Copermittee shall provide to the SDRWQCB a statement certified by its chief legal counsel that the Copermittee has adequate legal authority to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order. This statement shall include:

a. Identification of all departments within the jurisdiction that conduct urban runoff related activities, and their roles and responsibilities under this Order. Include an up to date organizational chart specifying these departments and key personnel.

b. Citation of urban runoff related ordinances and the reasons they are enforceable;

c. Identification of the administrative and legal procedures available to mandate compliance with urban runoff related ordinances and therefore with the conditions of this Order;

d. Description of how these ordinances are implemented and appealed; and

e. Description of whether the municipality can issue administrative orders and injunctions or if it must go through the court system for enforcement actions.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Copermittees shall develop and implement legal authority to "Control through ordinance, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that the Copermittee must demonstrate that it can control "through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Discussion: Copermittees must demonstrate that they can operate pursuant to legal authority to meet the requirements of Federal NPDES regulations 40 CFR 122.26(d)(2)(A-F). For the Copermittee demonstrate this legal authority, the US EPA suggests that "One acceptable way to support a declaration of adequate legal authority, including the ability to enforce appropriate ordinances, is for the municipality to provide a certification from the Municipal General Counsel or equivalent. The certification should state that the applicant has the legal authority to apply and enforce the requirements of 40 CFR 122.26(d)(2)(i)(A-F) in State or local courts. The certification would, therefore, cite specific ordinances and the reasons why they are enforceable. The statement should discuss what the municipality can do to ensure full compliance with 40 CFR 122.26(d)(2)(i)" (1992). The SDRWQCB has discretion to require Legal Authority item D.2 in Order No. 2001-01 under the broad and specific legal authority cited above.

E. TECHNOLOGY BASED STANDARDS

E. Technology Based Standards states the following:

*Each Copermittee shall implement, or require implementation of, best management practices to ensure that the following pollutant discharges **into** and **from** its MS4 are reduced to the applicable technology based standard as specified below:*

Table 3. Technology Based Standards

POLLUTANT DISCHARGE FROM	*DESCRIPTION*	*APPLICABLE PERFORMANCE STANDARD*
Industrial Activity owned by	*Categorical Industry in 40 CFR 122.26*	*BAT/BCT (pursuant*

POLLUTANT DISCHARGE FROM	*DESCRIPTION*	*APPLICABLE PERFORMANCE STANDARD*
the Copermittee		*to Statewide General Industrial Permit)*
Industrial Activity	*All other industry*	*MEP*
Construction Activity owned by the Copermittee	*Greater than or Equal to 5 Acres (or less than 5 acres and Part of a Larger Common Plan of Sale or Development)*	*BAT/BCT (pursuant to Statewide General Construction Permit)*
Construction Activity	*All Other construction*	*MEP*
Other Sources	*All Other Land Use Activities*	*MEP*
MS4s	*All discharges from MS4s*	*MEP*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: CWA section 402(p)(3)(A) requires "Permits for discharges associated with industrial activity shall meet all applicable provisions of this section and section 301."

CWA section 301(b)(2) requires "effluent limitations for categories and classes of point sources, other than publicly owned treatment works, which (i) shall require application of the best available technology economically achievable for such category or class, which will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for purposes of this subsection: [...] (x) Construction activity including clearing, grading and excavation activities [...]."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A-D) require municipalities to control pollutants in urban runoff discharges to the MS4 to the maximum extent practicable from urban land uses such as residential, commercial, municipal, industrial, and construction.

Discussion: Pollutant discharges in storm water to and from MS4s are held to applicable technology based standards. Storm water discharges to the MS4 from industrial and construction activities owned by the Copermittee, which fall under the general statewide industrial and construction storm water permits, must meet the BAT/BCT performance standard per permit requirements. This BAT/BCT performance standard is required in CWA section 301(b)(2), and is further described in CWA sections 304(b)(2-4).

Pollutant discharges in storm water **to** and **from** the MS4 for all other urban land use activities, including industrial and construction activities not covered under the statewide general permits, must be reduced to the maximum extent practicable. CWA section 402(p)(3)(B)(iii) and Federal NPDES regulation 40 CFR 122.26 (d)(2)(iv) require pollutant discharges in urban runoff discharged **from** MS4s to be reduced to the maximum extent practicable.

Since discharges which enter the MS4 are generally discharged unimpeded directly into receiving waters, the maximum extent practicable standard is to apply to both discharges into and from MS4s. Federal NPDES regulations clearly provide the SDRWQCB with the legal authority to require municipalities to control discharges from third parties into their MS4. 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff **from** commercial, residential, industrial, and construction land uses or activities to the maximum extent practicable. Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges **to** their MS4. This concept is further supported in the Preamble to the Phase II Final Rule NPDES storm water regulations, which states "The operators of regulated small MS4s cannot passively receive and discharge pollutants **from** third parties" (US EPA, 1999). Due to the greater water quality concerns generally experienced by larger municipalities, Phase II Final Rule findings for small municipalities are also applicable to larger municipalities such as the Copermittees. Finally, underlying the Federal NPDES storm water regulations is the Clean Water Act, which states in section 402(p)(3)(B)(ii) that municipalities shall "effectively prohibit non-stormwater discharges **into** the storm sewers."

The requirement for municipal storm water dischargers to have, and exercise, local governmental authority in order to comply with water quality control obligations is analogous to the requirement for Publicly Owned Treatment Works to have and exercise legal authority to require pretreatment of industrial wastes being discharged to their sewage collections systems (CWA 402(b)(8)).

The SDRWQCB has discretion to require Technology Based Standards item E. in Order No. 2001-01 under the broad and specific legal authority cited above.

F. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM

The following underlying broad legal authority citations generally apply to all directives of section F. Jurisdictional Urban Runoff Management Program of Order No. 2001-01, and provide the SDRWQCB with ample underlying authority to require each of the directives. These legal authority citations are also listed under the Underlying Broad Legal Authority for Order No. 2001-01 segment of section VII. of

this Fact Sheet/Technical Report. They are repeated here to emphasize their pertinence to the Jurisdictional Urban Runoff Management Program section of Order No. 2001-01, which is the primary component of the Order.

In addition to the five broad legal authority items cited below that underlie all of the directives in section F. of Order No. 2001-01, additional specific legal authority citations applicable to particular directives of section F. are provided in this section of the Fact Sheet/Technical Report as necessary. Some of these additional specific legal authority citations apply to entire components of section F. of Order No. 2001-01. In these cases, the specific legal authority quotations are provided at the beginning of the discussion of the permit component, while the legal authority is again cited under each directive of the component. Furthermore, some specific legal authority citations only apply to distinct directives of section F. of Order No. 2001-01. When this occurs, the quotation of the specific legal authority citation will appear with the discussion of the distinct permit directive.

CWA 402(p)(3)(B)(ii) – Prohibit Non-Storm Water
The CWA requires in section 402(p)(3)(B)(ii) that a storm water program "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers."

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

40 CFR 122.26(d)(2)(i)(B,C,E, and F) – Obtain Adequate Legal Authority
Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) provide that each Copermitee's permit application "shall consist of : (i) Adequate legal authority. A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to: […] (B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; (C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water; […] (E) Require compliance with condition in ordinances, permits, contracts or orders; and (F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) – Reduce to MEP and Whatever Else is Needed

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) provides that the Copermittee shall develop and implement a proposed management program which "shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. […] Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. […] Proposed management programs shall describe priorities for implementing controls."

CWC 13377 – Implement CWA and Whatever Else is Needed
California Water Code section 13377 provides that "Notwithstanding any other provision of this division, the state board or the regional boards shall, as required or authorized by the Federal Water Pollution Control Act (Clean Water Act), as amended, issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with an more stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

F. Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall take appropriate actions to reduce discharges of pollutants and runoff flow during each of the three major phases of urban development, i.e., planning, construction, and existing development (or use) phases.

Each Copermittee shall implement a Jurisdictional Urban Runoff Management Program (Jurisdictional URMP) that contains the components shown below as described in Sections F.1. through F.8:

- *F.1. Land-Use Planning for New Development and Redevelopment Component*
- *F.2. Construction Component*
- *F.3. Existing Development Component*
  - *a. Municipal*
  - *b. Industrial*
  - *c. Commercial*
  - *d. Residential*
- *F.4. Education Component*
- *F.5. Illicit Discharge Detection and Elimination Component*
- *F.6. Public Participation Component*
- *F.7. Assessment of Jurisdictional URMP Effectiveness Component*
- *F.8. Fiscal Analysis Component*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A – D) include provisions for inclusion of program components F.1 – F.8 in the Jurisdictional URMPs.

Discussion: As discussed in Finding 17, urban development has three major phases: (1) land use planning for new development; (2) construction; and (3) the land use or existing development phase. Because the Copermittees authorize each of these phases, they have commensurate responsibilities to protect water quality during each phase. Findings 18 – 20 indicate how each of these phases of development can be a significant source of pollutants in urban runoff and can impact receiving water quality. To address the potential negative impacts from the three phases of urban development, Urban Runoff Management Programs focusing on the three phases must be developed and implemented (see Finding 10). US EPA places importance on the development and implementation of URMPs when it states "Under the Part 2 application requirements, municipalities must propose site-specific storm water management programs. This is the most important aspect of the permit application" (1992). The SDRWQCB has discretion to require development and implementation of Jurisdictional Urban Runoff Management Programs in Order No. 2001-01 under the broad and specific legal authority cited above.

F.1. LAND-USE PLANNING FOR NEW DEVELOPMENT AND REDEVELOPMENT COMPONENT

In addition to the underlying broad legal authority citations listed above in section VII. of this Fact Sheet/Technical Report, the following specific legal authority item also generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.1. Land-Use Planning for New Development and Redevelopment Component of Order No. 2001-01. Other specific legal authority items applicable only to distinct directives of Jurisdictional Urban Runoff Management Program item F.1. are provided as necessary.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a proposed management program which is to include "A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed."

F.1. Land-Use Planning for New Development and Redevelopment Component states the following:

Each Copermittee shall minimize the short and long-term impacts on receiving water quality from new development and redevelopment. In order to reduce pollutants and runoff flows from new development and redevelopment to the maximum extent practicable, each Copermittee shall at a minimum:

F.1.a Revise General Plan
F.1.b Modify Development Project Approval Processes
F.1.c Revise Environmental Review Processes Including CEQA Checklists
F.1.d Conduct Education Efforts Focused on New Development and Redevelopment

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.1. Land-Use Planning for New Development and Redevelopment Component of Order No. 2001-01.

Discussion: As discussed in Finding 4, urban development can negatively impact receiving water quality by increasing the pollutant load, volume, and velocity of urban runoff. An effective means for minimizing these impacts is to address water quality concerns during the planning phase of urban development. US EPA supports this, stating "Post-construction storm water management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly effect receiving waterbodies. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction storm water discharges is the most cost-effective approach to storm water quality management" (2000). For these reasons, Order No. 2001-01 includes a requirement for the development and implementation of a Land-Use Planning for New Development and Redevelopment Component. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.1. in Order No. 2001-01 under the broad and specific legal authority cited above.

F.1.a. Revise General Plan of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall incorporate water quality and watershed protection principles and policies into the General Plan or equivalent plan (e.g., Comprehensive, Master, or Community Plan) to guide land-use decisions and require implementation of consistent water quality protection measures for all development projects. These principles and policies shall be designed to protect natural water bodies, reduce impervious land coverage, slow runoff, and where feasible, maximize opportunities for infiltration of rainwater into soil. Such water quality and watershed protection principles and policies shall include for example:

(1) Minimize the amount of impervious surfaces and directly connected impervious surfaces in areas of new development and redevelopment and where feasible maximize on-site infiltration of runoff.

(2) Implement pollution prevention methods supplemented by pollutant source controls and treatment. Use small collection strategies located at, or as close as possible to, the source (i.e., the point where water initially meets the ground) to minimize the transport of urban runoff and pollutants offsite and into an MS4.

(3) Preserve, and where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones. Encourage land acquisition of such areas.

(4) Limit disturbances of natural water bodies and natural drainage systems caused by development including roads, highways, and bridges.

(5) Prior to making land use decisions, utilize methods available to estimate increases in pollutant loads and flows resulting from projected future development. Require incorporation of structural and non-structural BMPs to mitigate the projected increases in pollutant loads and flows.

(6) Avoid development of areas that are particularly susceptible to erosion and sediment loss; or establish development guidance that identifies these areas and protects them from erosion and sediment loss.

(7) Reduce pollutants associated with vehicles and increasing traffic resulting from development. Coordinate local traffic management reduction efforts with the San Diego County Congestion Management Plan.

(8) Implement the San Diego Association of Government's (SANDAG's) recommendations as found in the Water Quality Element of its Regional Growth Management Strategy.

(9) For new development and significant redevelopment only: The post-development runoff rates and velocities from a site shall not exceed the pre-development runoff rates and velocities from the same site. Post-development runoff from a site shall not contain pollutant loads which cause or contribute to an exceedance or receiving water quality objectives or which have not been reduced to the maximum extent practicable. Post-development runoff discharges into a Clean Water Act section 303(d) water body shall not contain any pollutant (for which the water body is already impaired) in levels exceeding pre-development levels (for those same pollutants).

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.1. Land-Use Planning for New Development and Redevelopment Component of Order No. 2001-01.

Discussion: The US EPA finds that the Copermittee "must thoroughly describe how the municipality's comprehensive plan is compatible with the storm water regulations" (1992). To achieve this, the Copermittee shall incorporate water quality and watershed protection principles and policies into its General Plan (or equivalent plan). US EPA supports addressing

urban runoff problems in General Plans (or equivalent plans) when it states "Runoff problems can be addressed efficiently with sound planning procedures. Master Plans, Comprehensive Plans, and zoning ordinances can promote improved water quality by guiding the growth of a community away from sensitive areas and by restricting certain types of growth (industrial, for example) to areas that can support it without compromising water quality" (2000).

The principles included in Jurisdictional Urban Runoff Management Program item F.1.a. are based on findings by the SWRCB Urban Runoff Technical Advisory Committee. They incorporate basic measures which have been found to minimize pollutants in urban runoff from new development and redevelopment.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.1.a. in Order No. 2001-01 under the broad legal authority cited above.

F.1.b. Modify Development Project Approval Processes of the Jurisdictional Urban Runoff Management Program states the following:

Prior to project approval and issuance of local permits, Copermittees shall review each individual proposed project plan and require measures to ensure that pollutants and runoff from the development will be reduced to the maximum extent practicable and will not cause or contribute to an exceedance of receiving water quality objectives. Each Copermittee shall further ensure that all development will be in compliance with Copermittee storm water ordinances, local permits, all other applicable ordinances and requirements, and this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.1. Land-Use Planning for New Development and Redevelopment Component of Order No. 2001-01.

Discussion: As discussed in Finding 18, incorporating post-construction BMPs into new development and redevelopment during project planning and approval is an effective means for controlling pollutants in urban runoff. US EPA finds review of development plans during the project approval process necessary, stating: "Proposed storm water management programs should include planning procedures for both during and after construction to implement control measures to ensure that pollution is reduced to the maximum extent practicable in areas of new development and redevelopment. Design criteria and performance standards may be

used to assist in meeting this objective. Further, storm water management program goals should be reviewed during planning processes that guide development to appropriate locations and steer intensive land uses away from sensitive environmental areas. […] A municipality should describe how it plans to implement the proposed standards (e.g., through an ordinance requiring approval of storm water management programs, a review and approval process, and adequate enforcement)" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.1.b. in Order No. 2001-01 under the broad legal authority cited above.

F.1.b.(1). Conditions of Approval of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall include conditions of approval in local permits to ensure that pollutant discharges and runoff flows from development are reduced to the maximum extent practicable and that receiving water quality objectives are not violated throughout the life of the project. Such conditions shall, at a minimum:

(a) Require project proponent to implement pollution prevention and source control BMPs for all development projects.
(b) Require 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.
(c) Require project proponent to implement buffer zones for natural water bodies.
(d) Require industrial applicants subject to California's statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction), (hereinafter General Industrial Permit), to provide evidence of coverage under the General Industrial Permit.
(e) Require project proponent to ensure its grading or other construction activities meet the provisions specified in Section F.2. of this Order.
(f) Require project proponent to ensure long-term maintenance of all post-construction BMPs in perpetuity.
(g) Require project proponent to ensure that the post-development runoff rates and velocities from a site do not exceed the pre-development runoff rates and velocities from the same site. Require project proponent to ensure that post-development runoff pollutants loads from a site have been reduced to the maximum extent practicable and do not cause or contribute to an exceedance of water quality objectives. Require project proponent to ensure that post-development runoff into a Clean Water Act section 303(d) water body containing any pollutant (for which the water body is already impaired) does not exceed pre-development levels (for those same pollutants).

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.1. Land-Use Planning for New Development and Redevelopment Component of Order No. 2001-01.

Discussion: Regarding conditions of approval in storm water permits, the US EPA finds that "Proposed storm water management programs should include planning procedures for both during and after construction to implement control measures to ensure that pollution is reduced to the maximum extent practicable in areas of new development and redevelopment. Design criteria and performance standards may be used to assist in meeting this objective" (1992). The US EPA further finds that "The municipality should consider storm water controls and structural controls in planning, zoning, and site or subdivision plan approval" (1992). In addition, US EPA states each Copermittee should "have an ordinance or other regulatory mechanism requiring the implementation of post-construction runoff controls […]" (2000).

Furthermore, in its Phase II Final Rule, US EPA requires small municipalities to "Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects […]" (1999). Due to the greater water quality concerns generally experienced by larger municipalities, Phase II Final Rule requirements for small municipalities are also applicable to larger municipalities such as the Copermittees.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.1.b.(1). in Order No. 2001-01 under the broad legal authority cited above.

F.1.b.(2). Standard Urban Storm Water Mitigation Plans (SUSMPs) of the Jurisdictional Urban Runoff Management Program states the following:

Within 365 days of adoption of this Order, the Copermittees shall collectively develop a model Standard Urban Storm Water Mitigation Plan (SUSMP) to reduce pollutants and runoff flows from all new development and significant redevelopment projects falling under the priority project categories or locations listed in section F.1.b.(2)(a) below. Within 180 days of approval of the model SUSMP in the public process by the SDRWQCB, each Copermittee shall adopt its own local SUSMP, and amended ordinances consistent with the approved model SUSMP, and shall submit both (local SUSMP and amended ordinances) to the SDRWQCB.

Immediately following adoption of its local SUSMP, each Copermittee shall ensure that all new development and significant redevelopment projects falling under the priority project categories or locations listed in F.1.b.(2)(a) below meet SUSMP requirements. The SUSMP requirements shall apply to all priority projects or phases of priority projects, including those with approved tentative maps, which have not yet begun grading or construction activities.

(a) Priority Development Project Categories - SUSMP requirements shall apply to all new development and significant redevelopment projects falling under the priority project categories or locations listed below. Significant redevelopment is defined as the creation or addition of at least 5,000 square feet of impervious surfaces on an already developed site. Significant redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or

impervious surfaces. Where significant redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria discussed in section F.1.b.(2)(c) applies only to the addition, and not to the entire development.

i. Home subdivisions of 100 housing units or more. This category includes single-family homes, multi-family homes, condominiums, and apartments.

ii. Home subdivisions of 10-99 housing units. This category includes single-family homes, multi-family homes, condominiums, and apartments.

iii. Commercial developments greater than 100,000 square feet. This category is defined as any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than 100,000 square feet. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; and other light industrial facilities.

iv. Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

v. Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet.

vi. All hillside development greater than 5,000 square feet. This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

vii. Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. Environmentally sensitive areas include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. "Directly adjacent" means situated within 200 feet of the environmentally sensitive area. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely or predominantly of flows from the subject

development or redevelopment site, and not commingled with flows from adjacent lands.

viii. *Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.*

ix. *Street, roads, highways, and freeways. This category includes any paved surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.*

x. *Retail Gasoline Outlets. Retail Gasoline Outlet is defined as any facility engaged in selling gasoline.*

(b) *BMP Requirements – The SUSMP shall include a list of recommended pollution prevention, source control, and structural treatment BMPs. The SUSMP shall require all new development and significant redevelopment projects falling under the above priority project categories or locations to implement a combination of BMPs selected from the recommended BMP list, including at a minimum (1) pollution prevention BMPs, (2) source control BMPs, and (3) structural treatment BMPs. The BMPs shall, at a minimum:*

i. *Maintain pre-development peak storm water runoff discharge rates and velocities;*
ii. *Conserve natural areas;*
iii. *Minimize storm water pollutants of concern (through implementation of pollution prevention and source control BMPs). Identification of pollutants of concern should include consideration of any pollutants for which the development's receiving water bodies are listed as impaired under Clean Water Act section 303(d), any pollutant associated with the land use type of the development, any pollutant commonly associated with urban runoff, and increased runoff flow rate from the development and its potential downstream impacts;*
iv. *Remove pollutants of concern from urban runoff (through implementation of structural treatment BMPs);*
v. *Minimize directly connected impervious areas;*
vi. *Protect slopes and channels from eroding;*
vii. *Include storm drain stenciling and signage;*
viii. *Include properly designed outdoor material storage areas;*
ix. *Include properly designed trash storage areas;*
x. *Include proof of a mechanism for ongoing long-term BMP maintenance;*
xi. *Include additional water quality provisions applicable to individual priority project categories;*
xii. *Be designed to maximize their pollutant removal capabilities;*
xiii. *Be implemented as close to pollutant sources as possible and prior to runoff discharges into the MS4 or other receiving waters;*
xiv. *Ensure that post-development runoff does not contain pollutant loads which cause or contribute to an exceedance of water quality objectives or which have not been reduced to the maximum extent practicable; and*
xv. *Ensure that post-development runoff into a Clean Water Act section 303(d) water body containing any pollutant (for which the water body is already impaired) does not contain those same pollutants in levels exceeding pre-development levels.*

(c) Numeric Sizing Criteria – The SUSMP shall require structural treatment BMPs to be implemented at all priority development projects. In addition to meeting the BMP requirements listed in item F.1.b.(2)(b) above, all structural treatment BMPs

for a single priority development project shall collectively be sized to comply with the following numeric sizing criteria:

Volume

Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

i. The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record (0.6 inch approximate average for the San Diego County area); or

ii. The volume of runoff produced by the 85th percentile 24-hour rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

iii. The volume of annual runoff based on unit basin storage volume, to achieve 90% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial, (1993); or

iv. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event;

OR

Flow

Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

i. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or

ii. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or

iii. The maximum flow rate of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

(d) Equivalent Numeric Sizing Criteria - The Copermittees may develop any equivalent numeric sizing criteria or performance-based standard for post-construction structural treatment BMPs as part of the model SUSMP. Such equivalent sizing criteria may be authorized for use in place of the above criteria. In the absence of development and subsequent authorization of such equivalent numeric sizing criteria, the above numeric sizing criteria requirement shall be implemented.

(e) Pollutants of Concern – As part of the model SUSMP, the Copermittees shall develop a procedure for pollutants of concern to be identified for each new development or significant redevelopment project. The procedure shall include, at a minimum, consideration of (1) receiving water quality (including pollutants for which receiving waters are listed as impaired under Clean Water Act section 303(d)); (2) land use type of the development project and pollutants associated with that land use type; (3) pollutants expected to be present on site; and (4) changes in flow rates and volumes resulting from the development project and

sensitivity of receiving waters to changes in flow rates and volumes.

(f) Implementation Process – As part of the model SUSMP, the Copermittees shall develop a process by which SUSMP requirements will be implemented. The process shall identify at what point in the planning process development projects will be required to meet SUSMP requirements. The process shall also include identification of the roles and responsibilities of various municipal departments in implementing the SUSMP requirements, as well as any other measures necessary for the implementation of SUSMP requirements.

(g) Restaurants Less than 5,000 Square Feet - New development and significant redevelopment restaurant projects where the land area development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirement F.1.b.(2)(c) above. A restaurant is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC Code 5812).

(h) Waiver Provision – A Copermittee may provide for a project to be waived from the requirement of implementing structural treatment BMPs (F.1.b.(2)(c)) if infeasibility can be established. A waiver of infeasibility shall only be granted by a Copermittee when all available structural treatment BMPs have been considered and rejected as infeasible. Copermittees shall notify the SDRWQCB within 5 days of each waiver issued and shall include the name of the person granting each waiver.

As part of the model SUSMP, the Copermittees shall develop a program to require project proponents who have received waivers to transfer the savings in cost, as determined by the Copermittee(s), to a storm water mitigation fund. This program shall be implemented by all Copermittees which choose to provide waivers. Funds shall only be used on projects to improve urban runoff quality within the watershed of the waived project. The waiver program shall, at a minimum, identify:

i. The entity or entities that will manage the storm water mitigation fund (i.e., assume full responsibility for)
ii. The range and types of acceptable projects for which mitigation funds may be expended;
iii. The entity or entities that will assume full responsibility for each mitigation project including its successful completion
iv. How the dollar amount of fund contributions will be determined.

(i) Infiltration and Groundwater Protection – At a minimum, use of infiltration structural treatment BMPs shall meet the following conditions:

i. Use of infiltration structural treatment BMPs shall not cause or contribute to an exceedance of groundwater water quality objectives.
ii. Urban runoff shall undergo pretreatment such as sedimentation or filtration prior to infiltration.
iii. All dry weather flows shall be diverted from infiltration devices.
iv. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural treatment BMPs are to be used.
v. Infiltration structural treatment BMPs shall be adequately maintained to maximize pollutant removal capabilities.
vi. The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet.

vii. The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.

viii. Infiltration structural treatment BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as designated by each Copermittee.

ix. Infiltration structural BMPs shall be located a minimum of 100 feet horizontally from any water supply wells.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.1. Land-Use Planning for New Development and Redevelopment Component of Order No. 2001-01.

California Water Code Section 13267 provides that "the regional board may require that any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Discussion: Copermittees must utilize planning procedures to reduce the discharge of pollutants from new development and redevelopment to the maximum extent practicable. This is necessary due to the potential for new development to increase the volume, flow velocity, and pollutant load of urban runoff (see Findings 4 and 5). As the SWRCB Urban Runoff Technical Advisory Committee (TAC) states, "Urban development often results in impacts to the land and consequently the water bodies adjacent to the land. The two major changes that result from urbanization are changes in stream hydrology and an increase in pollutant loading." To alleviate these potential negative impacts on receiving waters, each Copermittee must develop and implement a Standard Urban Runoff Mitigation Plan for various categories of development.

General Information on SUSMPs

The Federal NPDES regulations (40 CFR 122.26(d)(2)(iv)(A)(2)) have required Copermittees since 1990 to utilize "planning procedures including a master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment." The current Municipal Storm Water Permit for San Diego County and Cities (Order No.

90-42) was issued before the promulgation of these regulations. Its references and requirements for new development and significant redevelopment are therefore nondescript, despite the presence of requirements for new development and significant redevelopment in the Federal NPDES regulations. Due to this lack of clarification regarding urban runoff management requirements for development in Order No. 90-42, development projects have typically proceeded with minimal measures to reduce the impacts of urban runoff coming from the projects.

Since the requirements of Order No. 90-42 regarding development are vague and have been largely ineffective, Order No. 2001-01 contains the SUSMP requirements, which are more prescriptive in order to ensure that adequate measures are taken to address urban runoff from development. The SWRCB Urban Runoff Technical Advisory Committee supports development of plans such as SUSMPs, stating that "The TAC recommends that communities of all sizes implement programs […] to address control of urban runoff pollution from new development and construction." US EPA further recommends design criteria (such as numeric sizing criteria) and performance standards for post-construction BMPs at development sites (1992). The increased specificity of the SUSMP requirements is also in line with US EPA Interim Permitting Approach guidance, which states that first-round permit BMPs should be expanded or better-tailored where necessary in subsequent permits to attain water quality standards (1996). In light of the continued impacts of urban runoff on receiving waters, the expanded BMP requirements of the SUSMPS are necessary to protect those receiving waters. As stated in the SWRCB's August 24, 2000 Draft Order on the appeal of the Los Angeles Regional Water Quality Control Board's (LARWQCB's) SUSMP action, "In the context of the entire effort required by the permit, the development controls can be seen as preventing the existing situation from becoming worse."

Comparison with LARWQCB Process

The SUSMP requirements (and their associated numeric sizing criteria) included in Order No. 2001-01 are highly controversial and have been widely discussed. While the SDRWQCB has followed the LARWQCB's lead in including SUSMP requirements in its Draft Municipal Storm Water Permit, it is important to note the differences between the approaches of the two regional boards. In its Municipal Storm Water Permit, the LARWQCB included requirements for its Copermittees to develop SUSMPs to address urban runoff from development. The requirements included general guidelines for the development of a plan (SUSMP) for post-construction BMP implementation at development project sites. The Los Angeles area Copermittees developed a model SUSMP and submitted it to the LARWQCB for approval. The LARWQCB then added details and requirements (including the numeric sizing criteria requirement) to their Copermittees' model SUSMP before approval. While the SWRCB has tentatively found in a draft order that

the LARWQCB acted appropriately, the addition of details and requirements to the Copermittees' model SUSMP was strongly contested.

The SDRWQCB has had the advantage of observing the SUSMP process the LARWQCB has undergone. In order to minimize potential conflicts, the SDRWQCB is inserting sufficient detail and requirements (such as numeric sizing criteria) up front in its Municipal Storm Water Permit, as opposed to adding the detail and requirements at a later date after the permit has been adopted. This will reduce the potential for unexpected requirements and allow for expanded discourse with interested parties on the subject. In addition, the SDRWQCB has already held a public hearing and a workshop on the subject of SUSMPs, with several other hearings and workshops on SUSMPs and the permit planned for the future.

The SDRWQCB has also been able to use the LARWQCB process to help clarify various issues regarding SUSMPs. For example, tentative findings in the SWRCB's draft order on the appeal of the LARWQCB's actions have been incorporated into Order No. 2001-01. The SDRWQCB has used the definition for "significant redevelopment" as it was included in the SWRCB's draft order. Tentative SUSMP guidance included in the SWRCB's draft order regarding environmentally sensitive areas[93], discretionary/non-discretionary projects, and a waiver funding requirement has also been used by the SDRWQCB to clarify applicable SUSMP requirements. Included here is a brief summary of the SWRCB's draft order.

Summary of SWRCB Draft Order on the Appeal of LARWQCB's Standard Urban Storm Water Mitigation Plan (SUSMP) Requirement for New Development

The State Water Resources Control Board (SWRCB) has issued a draft order on the subject of the appeal of the Los Angeles Regional Water Quality Control Board's (LARWQCB's) Standard Urban Storm Water Mitigation Plan (SUSMP) requirement for new development and significant redevelopment. The SUSMP requirement was prescribed for municipalities by the LARWQCB under the Municipal Storm Water Permit for the Los Angeles Region. In general, the SUSMP requirement called for municipalities to require certain categories of development projects to implement post-construction best management practices (BMPs) on site which would treat, filter, or infiltrate urban runoff generated by the development project. In particular, the SUSMPs provided that municipalities must ensure that post-construction BMPs for the categories of new development meet a specific numeric sizing criteria. The numeric sizing criteria required that post-construction BMPs for

93 The definition of "environmentally sensitive area" in Order No. 2001-01 includes Areas of Special Biological Significance (ASBS). These areas are designated by the Regional Boards and SWRCB in Water Quality Control Plans.

the categories of development be a specific size to effectively retain urban runoff pollutants and control urban runoff flows.

The SUSMP requirements were appealed to the SWRCB by many parties on several grounds. The petitioners for the appeal included approximately 24 municipalities (out of a total of approximately 80 municipalities), building industry representatives, and the Western States Petroleum Association. The principal contentions of the appeal included the following: (1) The LARWQCB failed to follow various proper procedural requirements in adopting the SUSMPs; (2) The SUSMPs (and numeric sizing criteria) did not properly apply the "maximum extent practicable" standard; (3) The LARWQCB failed to show that the SUSMPs are cost-effective and that the benefits to be obtained outweigh the costs; (4) Implementation of the SUSMP requirements posed a threat to groundwater; and (5) Various details of the SUSMP requirements were unclear and needed to be clarified/improved.

Regarding the procedural concerns of the appeal, if adopted the order would find that the LARWQCB complied with the necessary procedural requirements. Procedural requirements the order would find the LARWQCB to be in compliance with in adopting the SUSMPs include the Municipal Storm Water Permit for the Los Angeles Region, the Administrative Review Process, the Administrative Procedure Act, the California Environmental Quality Act (CEQA), and Constitutional provisions on state mandates.

On the controversial issue of post-construction BMPs and numeric sizing criteria, if adopted the SWRCB order would find that it is appropriate for the LARWQCB to require post-construction BMPs for new development and significant redevelopment. The SWRCB order would also find that the numeric sizing criteria for post-construction BMPs is a correct interpretation of the "maximum extent practicable" standard. As a basis for the tentative finding on numeric sizing criteria, the SWRCB order would refer to United States Environmental Protection Agency (US EPA) guidance documents, which explain that expanded or better-tailored BMPs should be required in second-round storm water permits, where necessary, to provide for the attainment of water quality standards. While citing the number of water bodies impaired by urban runoff in the region, the SWRCB order would find the expansion of BMP requirements to include numeric sizing criteria to be appropriate.

The SWRCB order, if adopted, would also deny the appeal that an adequate cost-benefit analysis for SUSMPs was not performed by the LARWQCB. The order would determine that the LARWQCB did not have to demonstrate that the water quality benefits of SUSMPs outweigh the costs. However, the order would find that the LARWQCB did evaluate the cost of SUSMP implementation. It would also further find that the one or two percent of total development cost incurred from SUSMP implementation is reasonable,

especially in light of the amount of impervious surface in Los Angeles County and the impacts on impaired water bodies.

The SWRCB order would also find that the LARWQCB adequately considered the potential for groundwater contamination stemming from implementation of the SUSMP requirements. The draft order states "The Regional Board did consider the potential impacts to groundwater from infiltration, and included appropriate limitations and guidance on its use as a BMP. These provisions will ensure adequate protection of groundwater from any adverse impacts due to infiltration."

With regards to the clarification/improvement of various SUSMP requirements, the SWRCB order, if adopted, would make several changes to the SUSMP document:

- Numeric sizing criteria would not be applied to retail gasoline outlets (RGOs). The SWRCB draft order cites the already heavy regulation of RGOs during construction, as well as feasibility and safety issues as the reasons for this proposed exemption. All other SUSMP requirements would continue to be applied to RGOs, however.
- "Significant redevelopment" would be defined as the creation or addition of at least 5,000 square feet of impervious surfaces to an already existing site. Also, where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development is not subject to the SUSMPs, the numeric sizing criteria would apply only to the addition, and not the entire development.
- "Environmentally sensitive areas" would be deleted from the development categories to which SUSMPs apply because they were poorly defined, with no minimum size limits. The SWRCB draft order states that this issue can be refined and addressed in a future re-issuance of the municipal storm water permit, however.
- SUSMP requirements would be limited to applying to discretionary projects only. The SWRCB draft order states that applying the requirements to non-discretionary projects is not consistent with the permit. However, the draft order further states that the LARWQCB may consider expanding development controls to non-discretionary projects in a future re-issuance of the permit.
- The waiver funding requirement would be deleted from the SUSMP. This proposed requirement provided that the project proponent transfer their cost savings (resulting from receiving a waiver from the requirement to meet numeric sizing criteria) to a storm water mitigation fund. The draft order deletes this requirement due the lack of a management structure for such a fund. Again, the draft order states that the LARWQCB may want to revisit the issue during the future re-issuance of the permit.

October 5, 2000 SWRCB Final Decision on the Appeal of the LARWQCB's SUSMP Requirements

At its October 5, 2000 hearing, the SWRCB made its final decision regarding the LARWQCB's SUSMP requirements. Essentially, the final decision upheld the tentative findings of the SWRCB draft order on SUSMPs. While the final order has not yet been issued, the hearing made it evident that the final decision would include two significant changes to the draft order, however. With regards to retail gasoline outlets, the SWRCB upheld its tentative decision to exempt retail gasoline outlets from the numeric sizing criteria requirement of the LARWQCB SUSMP at this time. However, the SWRCB further found that numeric sizing criteria requirements could be applied to retail gasoline outlets in future permits, provided that proper justification for the numeric sizing criteria requirement is presented. The SWRCB also clarified its support for regional approaches to the management of urban runoff from new development. The SWRCB noted that regional BMP approaches are not precluded as a means for complying with the SUSMP requirements, provided that the regional approaches are approved by the regional board.

Categories of Development

The categories of development to which SUSMPs apply are based on their potential to cause impairment to receiving water bodies. The various categories of development generally either result in large increases in impervious area or are potential significant sources of pollutants. Many of the categories of development have also historically been found by the SDRWQCB and the Copermittees to have mismanagement of urban runoff. As discussed in Findings 4 and 5, these changes in urban runoff volume, velocity, and pollutant load resulting from new development and redevelopment can cause significant receiving water quality degradation. To minimize this relatively high potential for receiving water degradation, a plan to meet SUSMP requirements must be developed and implemented.

One category of development to which SUSMPs are proposed to apply which has generated considerable discussion is retail gasoline outlets. At its October 5, 2000 public hearing on the appeal of the LARWQCB's SUSMP requirements, the SWRCB finalized its decision on whether the SUSMP numeric sizing criteria requirement is to apply to retail gasoline outlets. As discussed above, the SWRCB found that retail gasoline outlets could be required to meet the numeric sizing criteria requirement, provided that adequate justification for the requirement is presented. Given the predominant impervious surfaces of most retail gasoline outlets, new retail gasoline outlets significantly increase the flow volumes, rates, and velocities of urban runoff coming from the sites to above pre-development levels. As noted in Findings 4 and 5, increased runoff flow volumes, rates, and velocities can cause significant receiving water degradation. Furthermore,

the pervasive presence of automobiles at retail gasoline outlets provides a significant source of pollutants to the sites. Similar to parking lots, runoff from retail gasoline outlets can be high in heavy metals and petroleum products. Retail gasoline outlets are a well defined source of urban storm water pollutants that impair receiving waters.[94]

Much debate has been devoted to the potential infeasibility of implementing structural BMPs at retail gasoline outlets. Some BMPs may pose a threat to groundwater quality or may pose a safety risk due to potential combustion resulting from gasoline entering them. With regards to infiltration BMPs which may pose a threat to groundwater quality, the SDRWQCB agrees that infiltration BMPs should not be implemented at retail gasoline outlets. This does not preclude the use of other types of BMPs, however. Many other BMPs such as underground filters, treatment-trains, and catch basin inserts are available for implementation at retail gasoline outlets.

The risk from combustion from gasoline entering BMPs has also been mentioned as a concern. This concern ignores the fact that oil-water separators and other pretreatment BMPs have been implemented at retail gasoline outlets for many years without significant problems. Considering the volatile nature of gasoline, the potential risk from combustion should be negligible, since gasoline would most likely volatilize before flowing into any BMP. Irregardless, any concern over combustion risk exhibits the need for structural BMP implementation at retail gasoline outlets; the same gasoline that which would purportedly pose a risk of combustion would also pose an environmental risk to receiving waters if no structural BMPs were in place.

While its possible some structural BMPs may need to be precluded from use at retail gasoline outlets due to the above concerns, other structural BMPs may be applicable for implementation at retail gasoline outlets. For example, treatment-train BMPs such as StormFilters are effective in reducing soluble metal concentrations commonly found in urban runoff from retail gasoline outlets. Furthermore, catch-basin inserts have been found by a USEPA funded study to be effective in removing debris, sediment, and oil from retail gasoline outlet urban runoff without causing backup.[95] Clearly, out of the many structural BMPs available today, a some BMPs are applicable for application at retail gasoline outlets.

Other SDRWQCB SUSMP Resources

As mentioned above, SUSMPs (and the numeric sizing criteria provision in particular) have been discussed extensively. Additional information can be

[94] Los Angeles Regional Water Quality Control Board. 2000. Regional Board Comment on Proposed Order. Cites USEPA funded study conducted by County of Sacramento as identifying heavy metals in significant concentrations in urban runoff from gas stations.

[95] Rogue River National Wet Weather Demonstration Project. 1999. Evaluation of On-Line Media Filters in the Rouge River Watershed. RPO-NPS-TPM59.00.

obtained in the SDRWQCB's *Staff Report for Standard Urban Storm Water Mitigation Plans and Numerical Sizing Criteria for Best Management Practices,* the SDRWQCB's *Supplemental Information for Public Workshop on Numeric Sizing Criteria for Post-Construction BMPs for New and Re-Development,* and the SDRWQCB's *Draft Responses to Comments Received at Numeric Sizing Criteria Public Workshop II Held April 13, 2000.* These documents are available at www.swrcb.ca.gov/rwqcb9/Programs/Storm_Water/storm_water.html. The SDRWQCB documents available on the website include reference lists of documents and programs which can provide extensive guidance and examples on implementation of programs addressing urban runoff from new development and significant redevelopment.

For a discussion on storm water infiltration and groundwater protection, see the discussion for Finding 35 above.

The SDRWQCB has discretion to require Standard Urban Runoff Mitigation Plans in Jurisdictional Urban Runoff Management Program item F.1.b.(2). of Order No. 2001-01 under the broad and specific legal authority cited above.

F.1.c. Revise Environmental Review Processes Including CEQA Checklists of the Jurisdictional Urban Runoff Management Program states the following:

Revise current environmental review processes and California Environmental Quality Act (CEQA) initial study checklists to include requirements for evaluation of water quality effects and identification of appropriate mitigation measures. The CEQA initial study checklist shall include questions addressing increased pollutants and flows from the proposed project such as:

(a) Would the proposed project result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical storm water pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash).
(b) Would the proposed project result in significant alteration of receiving water quality during or following construction?
(c) Would the proposed project result in increased impervious surfaces and associated increased runoff?
(d) Would the proposed project create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes?
(e) Would the proposed project result in increased erosion downstream?
(f) Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, will it result in an increase in any pollutant for which the water body is already impaired?
(g) Is the project tributary to other environmentally sensitive areas? If so, will it exacerbate already existing sensitive conditions?
(h) Would the proposed project have a potentially significant environmental impact on surface water quality, to either marine, fresh, or wetland waters?
(i) Would the proposed project have a potentially significant adverse impact on ground water quality?
(j) Will the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?

(k) Will the project impact aquatic, wetland, or riparian habitat?

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.1. Land-Use Planning for New Development and Redevelopment Component of Order No. 2001-01.

Discussion: Consideration of the effects of new development and redevelopment on water quality during project approval processes will help ensure that potential water quality problems resulting from the development are identified and addressed. The US EPA finds that "Proposed storm water management programs should include planning procedures for both during and after construction to implement control measures to ensure that pollution is reduced to the maximum extent practicable in areas of new development and redevelopment. Design criteria and performance standards may be used to assist in meeting this objective" (1992). The US EPA further finds that "The municipality should consider storm water controls and structural controls in planning, zoning, and site or subdivision plan approval" (1992). The SWRCB Urban Runoff Technical Advisory Committee advises that the Copermittees' CEQA initial study checklists be revised to include consideration of water quality effects from new development or redevelopment. The questions included in Jurisdiction Urban Runoff Management Program item F.1.c. are based on questions recommended by the Technical Advisory Committee. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.1.c. in Order No. 2001-01 under the broad legal authority cited above.

F.1.d. Conduct Education Efforts Focused on New Development and Redevelopment of the Jurisdictional Urban Runoff Management Program states the following:

(1) Internal: Municipal Staff

Each Copermittee shall implement an education program to ensure that its planning and development review staffs have an understanding of:

(a) *Federal, state, and local water quality laws and regulations applicable to development projects;*
(b) *The connection between land use decisions and short and long term water quality impacts (i.e., impacts from land development and urbanization); and*
(c) *How impacts to receiving water quality resulting from development can be minimized (i.e., through implementation of various source control and structural BMPs).*

(2) External: Project Applicants, Developers, Contractors, Property Owners

As early in the planning and development process as possible, each Copermittee shall implement a program to educate project applicants, developers, contractors and property owners on the following topics:

(a) *Federal, state, and local water quality laws and regulations applicable to development projects;*
(b) *Required federal, state, and local permits pertaining to water quality;*
(c) *Water quality impacts of urbanization; and*
(d) *Methods for minimizing the impacts of development on receiving water quality.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.1. Land-Use Planning for New Development and Redevelopment Component of Order No. 2001-01.

Discussion: Training of municipal planning and development review staff is a critical aspect of an urban runoff management program. As discussed in Finding 18, development and implementation of urban runoff control measures as early in the project planning process as possible is an effective means (in terms of both cost and performance) for minimizing the impacts of urban runoff to receiving waters. Municipal planning and development review staff are well-positioned to ensure that water quality considerations are incorporated into development projects in the early planning stages. With adequate training, municipal planning and development review staff can require implementation of BMPs early in the project planning process, thereby minimizing the urban runoff impacts of development in a cost effective manner. US EPA supports training of municipal staff when it identifies "training for appropriate employees" as a measurable goal of an urban runoff management program (2000).

Education on storm water planning issues for the public sector involved with development is equally critical. When the public sector has knowledge of storm water issues and regulations, it is more likely to incorporate storm water planning in the development and redevelopment process. In this manner, implementation of measures to address storm water issues will be included in development plans, saving time and money for the developer and the municipality. The SWRCB Urban Runoff Technical Advisory Committee finds that Copermittees should "Establish an education/information dissemination program that includes such things as: brochures to distribute to developers and contractors at permit counters and by mail; reference and training manuals for planners, engineers, inspectors, developers, contractors; and training and information exchange workshops."

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.1.d. in Order No. 2001-01 under the broad legal authority cited above.

F.2. CONSTRUCTION COMPONENT

In addition to the underlying broad legal authority citations listed above in section VII. of this Fact Sheet/Technical Report, the following specific legal authority item also generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01. Other specific legal authority items applicable only to distinct directives of Jurisdictional Urban Runoff Management Program item F.2. are provided as necessary.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) provides that the proposed management program include "A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system."

F.2. Construction Component of the Jurisdictional Urban Runoff Management Program states the following:

The Copermittees shall implement a Construction Component of its Jurisdictional URMP to reduce pollutants in runoff from construction sites during all construction phases. At a minimum the construction component shall address:

F.2.a. Pollution Prevention
F.2.b. Grading Ordinance Update
F.2.c. Modify Construction and Grading Approval Process
F.2.d. Source Identification
F.2.e. Threat to Water Quality Prioritization
F.2.f. BMP Implementation
F.2.g. Inspection of Construction Sites
F.2.h. Enforcement Measures for Construction Sites
F.2.i. Reporting of Non-compliant Sites
F.2.j. Education Focused on Construction Activities

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Discussion: CWA sections 402(p)(3)(B)(ii-iii) requires each Copermittee to prohibit non-storm water discharges into its MS4 and to reduce the discharge of pollutants to the maximum extent practicable for all urban land uses. The purpose of these two broad requirements is to minimize the short and long-term impacts of urban runoff on receiving water quality. Land used for construction activities is clearly identified in the federal regulations as one of several high priority land uses from which pollutants in urban runoff discharges must be reduced to the maximum extent practicable by each Copermittee. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) requires the development of a proposed management program to reduce the discharge of pollutants in storm water to the maximum extent practicable. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) requires that this program include components which address construction sites and activities.

Natural erosion processes are accelerated when existing protective cover is removed during construction. Suspended sediments constitute the largest mass of pollutant loadings to surface waters. As discussed in Finding 19, the primary source of these sediments is construction sites. Sediments from construction site erosion can be effectively reduced in urban runoff by the application of a wide range of BMPs, which emphasize pollution prevention and source control and are supplemented by treatment control BMPs. For these reasons, each Copermittee must develop and implement a Construction Component which utilizes BMPs to control pollutants in runoff generated from construction sites.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.2 in Order No. 2001-01 under broad legal authority cited above.

F.2.a. Pollution Prevention (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement pollution prevention methods in its Construction Component and shall require its use by construction site owners, developers, contractors, and other responsible parties.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) provides that the proposed management program include "A description of procedures for

site planning which incorporate consideration of potential water quality impacts."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include "A description of requirements for nonstructural and structural best management practices."

Discussion: Each Copermittee must develop a program to reduce the discharge of pollutants in storm water from construction sites to the maximum extent practicable. In order to achieve this level of pollution reduction, BMPs must be implemented. As discussed in Finding 12, pollution prevention (the reduction or elimination of pollutant generation at its source) is an essential aspect of BMPs. By limiting the generation of pollutants, less pollutants are available to be washed from construction sites, resulting in reduced pollutant loads in storm water discharges from these sites. In addition, there is no need to control or treat pollutants which are not initially generated. Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media. In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. Since pollution prevention is an effective and efficient means for reducing pollutant loads in storm water runoff, pollution prevention methods are an important aspect of BMPs to be included in the Construction Component of the Jurisdictional URMP. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.4.a in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.b. Grading Ordinance Update (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall review and update its grading ordinances as necessary for compliance with its storm water ordinances and this Order. The updated grading ordinance shall require pollution prevention, source control, and structural treatment BMPs to be implemented during all construction activities, including for example:

(1) Erosion prevention;
(2) Seasonal restrictions on grading;
(3) Slope stabilization requirements;
(4) Phased grading;
(5) Revegetation as early as feasible;
(6) Preservation of natural hydrologic features;
(7) Preservation of riparian buffers and corridors;
(8) Maintenance of all source control and structural treatment BMPs; and
(9) *Retention of sediment and other construction pollutants on site..*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) provides that the proposed management program include "A description of procedures for site planning which incorporate consideration of potential water quality impacts."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include "A description of requirements for nonstructural and structural best management practices."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermitee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for the purposes of this subsection: [...] (x) Construction activity including cleaning, grading and excavation activities [...]."

Discussion: Copermittees must reduce pollutant discharges in storm water from construction sites to the maximum extent practicable. In order to achieve this level of pollution reduction, BMPs must be implemented. An effective means for ensuring BMP implementation at construction sites is through the development and implementation of grading ordinances which require pollution prevention, source control, and structural treatment BMPs. Updated grading ordinances which adequately address water quality considerations will provide Copermittees with the necessary legal authority to require effective BMPs at construction sites.

The US EPA suggests that local ordinance be used to require implementation of BMPs, stating that "A description of the local erosion and sediment control law or ordinance is needed to satisfy this requirement [i.e., Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2)]" (1992). Regarding Copermittee approval of construction activities, the US EPA further states that "applicants must propose site review and approval procedures that address sediment and erosion controls, storm water management, and other appropriate measures. Approvals should be clearly tied to commitments to implement structural and nonstructural BMPs during the construction process" (1992).

Furthermore, in its Phase II Final Rule, US EPA requires small municipalities to develop and implement for construction sites "An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance […]" (1999). Due to the greater water quality concerns generally experienced by larger municipalities, Phase II Final Rule requirements for small municipalities are also applicable to larger municipalities such as the Copermittees.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.2.b in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.c. Modify Construction and Grading Approval Process (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

Prior to approval and issuance of local construction and grading permits, each Copermittee shall review all individual proposed construction and grading plans and require measures to ensure that pollutants from the site will be reduced to the maximum extent practicable and will not cause or contribute to an exceedance of water quality objectives. Each Copermittee shall further ensure that all grading and construction activities will be in compliance with applicable Copermittee ordinances (e.g., storm water, grading, construction, etc.) and other applicable requirements, including this Order.

(1) Conditions of Approval

Include conditions of approval in local grading and construction permits to ensure that pollutant discharges are reduced to the maximum extent practicable and water quality objectives are not violated during the construction phase. Such conditions shall include for example:

(a) Require project proponent to develop and implement a plan to manage storm water and non-storm water discharges from the site at all times;
(b) Require project proponent to coincide grading with seasonal dry weather periods;
(c) Require project proponent to emphasize erosion prevention as the most important measure for keeping sediment on site during construction;
(d) Require project proponent to utilize sediment controls as a supplement to erosion prevention for keeping sediment on-site during construction, and never as the single or primary method;
(e) Require project proponent to minimize areas that are cleared and graded to only the portion of the site that is necessary for construction;
(f) Require project proponent to minimize exposure time of disturbed soil areas;
(g) Require project proponent to temporarily stabilize and reseed disturbed soil areas as rapidly as possible;
(h) Require project proponent to permanently revegetate or landscape as early as feasible;
(i) Require project proponent to stabilize all slopes; and
(j) *Require project proponents subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities, (hereinafter General Construction Permit), to provide evidence of existing coverage under the General Construction Permit.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) provides that the proposed management program include "A description of procedures for site planning which incorporate consideration of potential water quality impacts."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include "A description of requirements for nonstructural and structural best management practices."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermitee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for the purposes of this subsection: […] (x) Construction activity including cleaning, grading and excavation activities […]."

Discussion: As discussed in Finding 16, since each Copermittee approves and issues construction and grading permits, and discharges from construction and grading activities enter its MS4, each Copermittee is responsible for the pollutant discharges resulting from construction and grading activities. Each Copermittee must ensure that pollutant discharges from construction and grading activities are reduced to the maximum extent practicable and do not result in degradation of receiving waters. An effective means for achieving this is to develop conditions of approval for grading and construction permits which require measures to minimize pollutant discharges. The US EPA recommends approval processes which consider water quality impacts, stating that approval process requirements should "include phasing development to coincide with seasonal dry periods, minimizing areas that are cleared and graded to only the portion of the site that is necessary for construction, exposing areas for the briefest period possible, and stabilizing and reseeding disturbed areas rapidly after construction activity is completed" (1992). Other suggested construction and

grading conditions of approval listed in this item are based on SWRCB Urban Runoff Technical Advisory Committee recommendations.

During approval and issuance of grading and construction permits, each Copermittee must review construction and grading plans to ensure that the conditions of approval are met. US EPA states that to determine if a construction site is in compliance with construction and grading ordinances and permits, the "MS4 operator should review the site plans submitted by the construction site operator before ground is broken" (2000). Furthermore, in its Phase II Final Rule, US EPA requires small municipalities to develop and implement for construction sites "Procedures for site plan review which incorporate consideration of potential water quality impacts" (1999). Due to the greater water quality concerns generally experienced by larger municipalities, Phase II Final Rule requirements for small municipalities are also applicable to larger municipalities such as the Copermittees.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.2.c in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.d. Source Identification (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall annually develop and update, prior to the rainy season, a watershed based inventory of all construction sites within its jurisdiction regardless of site size or ownership. This requirement is applicable to all construction sites regardless of whether the construction site is subject to the California statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities (hereinafter General Construction permit), or other individual NPDES permit. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Discussion: In order to prohibit non-storm water discharges, reduce construction pollutant sources to the maximum extent practicable, and

ensure that adequate BMPs are implemented, Copermittees must first identify all of the construction sites within their jurisdiction. The construction sites are to be inventoried on a watershed basis in order to help with prioritization of the sites. For example, construction sites which are found to be located in a watershed with impaired receiving waters for sediment should be considered a high priority for BMP implementation, inspections, and enforcement. The US EPA requires that all construction sites be addressed (and therefore inventoried), stating: "All construction sites, regardless of size, must be addressed by the municipality. To begin to identify these sites, the applicant should obtain lists of construction site operators that are covered by general or individual storm water NPDES permits from the NPDES permitting authority. However, construction sites not covered by a storm water discharge permit also need to be addressed by the municipality. The best way to identify these construction sites and implement an effective BMP program to reduce pollutants in their runoff is through the site planning process" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.4.d in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.e. Threat to Water Quality Prioritization (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

(1) To establish priorities for construction oversight activities under this Order, the Copermittee shall prioritize each watershed based inventory (developed pursuant to F.2.d. above) by threat to water quality. Each construction site shall be classified as high, medium, or low threat to water quality. In evaluating threat to water quality each Copermittee shall consider (1) soil erosion potential; (2) site slope; (3) project size and type; (4) sensitivity of receiving water bodies; (5) proximity to receiving water bodies; (6) non-storm water discharges; and (7) any other relevant factors.

(2) *A high priority construction site shall at a minimum be defined as a site meeting any one of the following criteria or equivalent criteria:*

(a) 50 acres or more;
(b) Grading will occur during the wet season;
(c) Highly erosive soils;
(d) Hillside development; and
(e) *Tributary to a Clean Water Act section 303(d) impaired water body or other environmentally sensitive area (as defined in section F.1.b.(2)(a)vii of this Order).*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Discussion: As discussed in Finding 19, construction sites are high risk areas for pollutant discharges to storm water. Development of an inventory of construction sites within a watershed will help identify potential sources of pollutants in storm water. By assessing information provided in the inventory (such as site topography and site proximity to receiving waters), sites can be prioritized by threat to water quality. Those sites which pose the greatest threat can then be targeted for inspection and monitoring. This will allow for limited inspection and monitoring time to be most effective.

The types of construction sites identified as high priority in this item are identified as such due to their high potential for erosion and impacting receiving waters. These types of construction sites are generally large, requiring grading of a large area, resulting in a large area of disturbed earth which is susceptible to erosion. Hillside construction is also high priority, due to its susceptibility to slope erosion. Any construction sites tributary to a CWA section 303(d) waterbody are also high priority due to their potential to further degrade those waterbodies. US EPA supports this type of prioritization, stating that municipalities should "identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, and the characteristics of soils and receiving water quality" (2000).

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.2.e in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.f.(1), F.2.f.(2), and F.2.f.(3) BMP Implementation (Construction) of the Jurisdictional Urban Runoff Management Program state the following:

(1) Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality construction sites (as determined under section F.2.e). BMPs are to be implemented year round.

(2) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the site's threat to water quality rating) at each construction site within its jurisdiction year round. If particular minimum BMPs are infeasible at any specific site, each Copermittee shall implement, or require the implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order, including BMPs which are more stringent than those required under the statewide General Construction Permit.

(3) *Each Copermittee shall implement, or require the implementation of, BMPs year round; however, BMP implementation requirements can vary based on wet and dry seasons.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include "A description of requirements for nonstructural and structural best management practices."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Discussion: Copermittees must reduce the discharge of pollutants in storm water from construction sites to the maximum extent practicable. To achieve this level of pollutant reduction, BMPs must be implemented (see Finding 11). Designation of a set of minimum BMPs for high, medium, and low threat construction sites will help ensure that appropriate BMPs are implemented at construction sites. These minimum BMPs will also serve as guidance as to the level of water quality protection required.

Regarding designation of BMPs to be implemented, the US EPA states that "the proposed management program should describe requirements for nonstructural and structural BMPs that operators of construction activities that discharge to MS4s must meet" (1992). While minimum BMPs will be required at all construction sites, implementation of particular BMPs will be site specific in order to address various conditions at different sites. Regarding site specific BMPs, the US EPA states "Appropriate structural and nonstructural control requirements will vary by project. Project type, size, and duration, as well as soil composition, site slope, and proximity to sensitive receiving waters will determine the appropriate structural and nonstructural BMPs" (1992).

In order to comply with Order No. 2001-01 requirements, implemented BMPs may need to be more stringent than those required under the statewide General Construction Permit. The US EPA implies that local sediment and erosion control requirements may be more stringent than statewide General Construction Permit requirements when it states that "construction sites

covered under NPDES permit regulations must indicate whether they are in compliance with State and local sediment and erosion control plans" (1992).

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program items F.2.f.(1-3) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.f.(4) BMP Implementation (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement, or require implementation of, additional controls for construction sites tributary to CWA section 303(d) impaired water bodies, coastal lagoons, or other sensitive water bodies as necessary to comply with this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Discussion: CWA section 303(d) water bodies are impaired water bodies which are not achieving the water quality objectives necessary to protect their beneficial uses. As discussed in Finding 3, urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. Since discharges which cause or contribute to an exceedance of water quality standards are prohibited (see section C.1. of Order No. 2001-01), any discharges to CWA section 303(d) waterbodies of pollutants for which the waterbody is impaired are prohibited. Therefore, construction sites and activities tributary to these water bodies must implement additional controls to ensure that they are not discharging the pollutants which are causing or contributing to the impairment of these water bodies.

With regards to coastal lagoons and other sensitive water bodies, additional controls are needed to protect these valuable and unique resources. In their Nonpoint Source Program Strategy and Implementation Plan, the SWRCB and California Coastal Commission support additional controls for critical coastal areas, stating "the State will seek to attain and maintain applicable

water quality standards, and protect waters threatened by land uses, or by substantial expansion of existing land uses, by implementing additional management measures."

Furthermore, US EPA supports additional controls for construction sites tributary to impaired or sensitive water bodies, stating "The proximity and sensitivity of the receiving water to which the construction site discharges is an important consideration. For construction sites that discharge to receiving waters that do not support their designated use or other waters of special concern, additional construction site controls are probably warranted and should be strongly considered" (1992).

The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Program item F.2.f.(4) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.g. Inspection of Construction Sites (Construction) of the Jurisdictional Urban Runoff Management Program item F.4.g states the following:

(1) Each Copermittee shall conduct construction site inspections for compliance with its ordinances (grading, storm water, etc.), permits (construction, grading, etc.), and this Order. Inspections shall include review of site erosion control and BMP implementation plans.

(2) Each Copermittee shall establish inspection frequencies and priorities as determined by the threat to water quality prioritization described in F.2.e above. During the wet season (i.e., October 1 through April 30 of each year), each Copermittee shall inspect, at a minimum, each High Priority construction site, either:

(a) Weekly
OR
(b) Monthly for any site that the responsible Copermittee certifies in a written statement to the SDRWQCB all of the following (certified statements may be submitted to the SDRWQCB at any time for one or more sites):

i. Copermittee has record of construction site's Waste Discharge Identification Number (WDID#) documenting construction site's coverage under the statewide General Construction Permit; and
ii. Copermittee has reviewed the constructions site's Storm Water Pollution Prevention Plan (SWPPP); and
iii. Copermittee finds SWPPP to be in compliance with all local ordinances, permits, and plans; and
iv. Copermittee finds that the SWPPP is being properly implemented on site.

At a minimum, Medium and Low Priority construction sites shall be inspected by Copermittees twice during the wet season. All construction sites shall be inspected by the Copermittees as needed during the dry season (i.e., May 1 through September 30 of each year).

(3) Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Discussion: As discussed in Finding 24, inspections provide a necessary means by which Copermittees can evaluate compliance with their ordinances. Inspections are especially important at high risk areas for pollutant discharges, such as industrial and construction sites. To ensure that BMPs are properly installed, US EPA states MS4 operators should "develop procedures for site inspection and enforcement of control measures to deter infractions" (2000). Regarding inspections, US EPA further finds "Inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties" (2000).

Construction site inspections shall be conducted to determine compliance with applicable ordinances and permits, including Order No. 2001-01. To this effect, the US EPA finds that "Site inspections are expected to be the primary enforcement mechanism by which erosion and sediment controls are maintained" (1992). When inspections result in findings of noncompliance, follow-up by the Copermittee to ensure compliance is necessary. The US EPA states "Effective inspection and enforcement requires […] intervention by the municipal authority to correct violations" (1992).

Construction site inspection frequencies are to be based on threat to water quality prioritization. US EPA supports this, stating that site inspection procedures should "identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, and the characteristics of soils and receiving water quality" (2000). For example, construction sites which are considered a high threat to water quality are to be given a high priority for inspection. This will allow for limited inspection and monitoring time to be most effective. Weekly to monthly inspection of high threat sites is necessary due to the dynamic nature of construction activities. Medium and low threat construction sites can be inspected less frequently, due to their reduced risk of negatively impacting receiving waters. Review of SWPPPs can be one effective tool for determining frequency of site

inspections. Construction sites which effectively implement the measures of a comprehensive SWPPP may not need to be inspected as frequently as less diligent sites.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.2.g in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.h. Enforcement of Construction Sites (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall enforce its ordinances (grading, storm water, etc.) and permits (construction, grading, etc.) at all construction sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include sanctions to ensure compliance. Sanctions shall include for example: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Discussion: Each Copermittee must develop grading and storm water ordinances under its Jurisdictional Urban Runoff Management Program. As discussed in Finding 24, when a Copermittee determines a violation of its grading or storm water ordinance, it must pursue correction of the violation. A critical aspect of the correction of violations is enforcement of ordinances. Enforcement increases the probability of correction of a violation. The US EPA supports development of enforceable ordinances and permits when it states "applicants must describe proposed regulatory programs to reduce pollutants in storm water runoff from construction sites to the MS4" (1992). The US EPA supports enforcement of these ordinances and permits at construction sites when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described" (1992).

Furthermore, in its Phase II Final Rule, US EPA requires small municipalities to develop and implement "An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance […]" (1999). Due to the greater water quality concerns generally experienced by larger municipalities, Phase II Final Rule requirements for small municipalities are also applicable to larger municipalities such as the Copermittees.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.2.h of Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.i. Reporting of Non-compliant Sites (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall provide oral notification to the SDRWQCB of non-compliant sites within its jurisdiction within 24 hours of the incidence of noncompliance, as required under section R.1 (and B.7 of Attachment C) of this Order. Such oral notification shall be followed up by a written report to be submitted to the SDRWQCB within 5 days of the incidence of non-compliance as required under section R.1 (and B.7 of Attachment C) of this Order. Sites are considered non-compliant when one or more violations of local ordinances, permits, plans, or this Order exist on the site.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Federal NPDES regulation 40 CFR 122.44(I)(6) states "The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of non-compliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance."

Discussion: Follow-up with non-compliant construction sites is essential to ensure that the site has taken adequate corrective measures to achieve compliance. To help ensure that compliance has been achieved, the Copermittees shall report non-compliant industrial sites to the SDRWQCB. The SDRWQCB can then participate in follow-up efforts to assure that the construction site is in compliance. Notification of non-compliance is common to all NPDES permits under Federal NPDES regulation 40 CFR 122.44(I)(6). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.b.(7) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.2.j. Education Focused on Construction Activities (Construction) of the Jurisdictional Urban Runoff Management Program states the following:

(1) Internal: Municipal Staff

Each Copermittee shall implement an education program to ensure that its construction, building, and grading review staffs and inspectors have an understanding of:

(a) *Federal, state, and local water quality laws and regulations applicable to construction and grading activities.*
(b) *The connection between construction activities and water quality impacts (i.e., impacts from land development and urbanization).*
(c) *How erosion can be prevented.*
(d) *How impacts to receiving water quality resulting from construction activities can be minimized (i.e., through implementation of various source control and structural BMPs).*
(e) *Applicable topics listed in section F.4. of this Order.*

(2) External: Project Applicants, Contractors, Developers, Property Owners, and other Responsible Parties

Each Copermittee shall implement an education program to ensure that project applicants, contractors, developers, property owners, and other responsible parties have an understanding of the topics outlined in section F.2.i.1. above of this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.2. Construction Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Discussion: As discussed in Finding 23, implementation of an education program is an important best management practice for construction sites and

activities. The SWRCB Technical Advisory Committee "recognizes that education with an emphasis on pollution prevention is the fundamental basis for solving nonpoint source pollution problems." The TAC points out several target communities for education efforts, including "Government: Educate agencies and officials to achieve better communication, consistency, collaboration, and coordination at the federal, state and local levels" and "Development Community: Educate the development community, including developers, contractors, architects, and local government planners, engineers, and inspectors, on nonpoint source pollution problems associated with development and redevelopment and construction activities and involve them in problem definitions and solutions."

The US EPA also supports education efforts for parties involved in construction, stating "technical information on how to incorporate storm water management with erosion and sediment control and other BMP training courses are recommended for municipal employees and construction site operators."

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.2.j. in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3. EXISTING DEVELOPMENT COMPONENT

F.3. Existing Development Component of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall minimize the short and long-term impacts on receiving water quality from all types of existing development.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Discussion: CWA sections 402(p)(3)(B)(ii-iii) require each Copermittee to prohibit non-storm water discharges into its MS4 and to reduce the discharge of pollutants to the maximum extent practicable for all urban land uses. The purpose of these two broad requirements is to minimize the short and long-term impacts of urban runoff on receiving water quality. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3 of Order No. 2001-01 under the broad legal authority cited above.

F.3.a. MUNICIPAL (EXISTING DEVELOPMENT)

In addition to the underlying broad legal authority citations listed above in section VII. of this Fact Sheet/Technical Report, the following specific legal authority items also generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01. Other specific legal authority items applicable only to distinct directives of Jurisdictional Urban Runoff Management Program item F.3.a. are provided as necessary.

> Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) provides that the proposed management program include "A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers."
>
> Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(3) provides that the proposed management program include "A description for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of deicing activities."
>
> Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) provides that the proposed management program include "A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible."
>
> Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(5) provides that the proposed management program include "A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."
>
> Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

F.3.a. Municipal (Existing Development) of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall implement a Municipal (Existing Development) Component to prevent or reduce pollutants in runoff from all municipal land use areas and activities. At a minimum the municipal component shall address:*

F.3.a.(1) Pollution Prevention
F.3.a.(2) Source Identification
F.3.a.(3) Threat to Water Quality Prioritization
F.3.a.(4) BMP Implementation
F.3.a.(5) Maintenance of Municipal Separate Storm Sewer System
F.3.a.(6) Management of Pesticides, Herbicides, and Fertilizers
F.3.a.(7) Inspection of Municipal Areas and Activities
F.3.a.(8) Enforcement of Municipal Areas and Activities

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: CWA sections 402(p)(3)(B)(ii-iii) requires each Copermittee to prohibit non-storm water discharges into its MS4 and to reduce the discharge of pollutants to the maximum extent practicable for all urban land uses. The purpose of these two broad requirements is to minimize the short and long-term impacts of urban runoff on receiving water quality. Land used for municipal activities is clearly identified in the federal regulations as one of several high priority land uses from which pollutants in urban runoff discharges must be reduced to the maximum extent practicable by each Copermittee. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) requires the development of a proposed management program to reduce the discharge of pollutants in storm water to the maximum extent practicable. Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1) and 40 CFR 122.26 (d)(2)(iv)(A)(3-6) require that this program include components which address municipal areas and activities.

US EPA targets municipal areas and activities "to help ensure a reduction in the amount and type of pollution that (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways; and (2) results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems" (2000). To reduce pollutant discharges from municipal areas and activities to the maximum extent practicable, BMPs must be implemented. Therefore, a municipal existing development component requiring BMPs must be developed and implemented as part of each Copermittee's Jurisdictional URMP.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3.a in Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(1) Pollution Prevention (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall implement pollution prevention methods in its Municipal (Existing Development) Component and shall require its use by appropriate municipal departments and personnel.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: Each Copermittee must develop a program to reduce the discharge of pollutants to and from the MS4 to the maximum extent practicable for all urban land uses and activities, including municipal areas and activities. In order to achieve this level of pollution reduction, BMPs must be implemented. Pollution prevention, the reduction or elimination of pollutant generation at its source, is an essential aspect of BMPs. By limiting the generation of pollutants, less pollutants are available to be washed from municipal areas and activities, resulting in reduced pollutant loads in storm water discharges from these areas and activities. In addition, there is no need to control or treat pollutants which are not initially generated. Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media. In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. Since pollution prevention is an effective and efficient means for reducing pollutant loads in storm water runoff, pollution prevention methods are an important aspect of BMPs to be included in the municipal existing development component. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3.a.(1) in Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(2) Source Identification (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall develop, and update annually, a watershed based inventory of the name, address (if applicable), and description of all municipal land use areas and activities which generate pollutants. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended when applicable, but not required.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: In order to prohibit non-storm water discharges, reduce municipal pollutant sources to the maximum extent practicable, and ensure that adequate BMPs are implemented, Copermittees must first identify all of the municipal areas and pollutant source activities within their jurisdiction. The municipal areas and pollutant source activities are to be inventoried on a watershed basis in order to help with prioritization of the sites. For example, municipal pollutant sources which are found to be located in a watershed with impaired receiving waters should be considered a high priority for BMP implementation, inspections, and monitoring. Regarding municipal pollutant source inventories, the US EPA states "The first step is to identify facilities that handle municipal waste and summarize their operations" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3.a.(2) of Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(3)(a) Threat to Water Quality Prioritization (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

To establish priorities for oversight of municipal areas and activities required under this Order, each Copermittee shall prioritize each watershed inventory in F.3.a.(2) above by threat to water quality and update annually. Each municipal area and activity shall be classified as high, medium, or low threat to water quality. In evaluating threat to water quality each Copermittee shall consider (1) type of municipal area or activity; (2) materials used; (3) wastes generated; (4) pollutant discharge potential; (5) non-storm water discharges; (6) size of facility or area; (7) proximity to receiving water bodies; (8) sensitivity of receiving water bodies; and (9) any other relevant factors.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: Many municipal pollutant sources pose a high risk for pollutant discharges to storm water. By assessing information provided in the municipal pollutant source inventory (such as principal pollutants used or services provided by a municipal facility), sites can be prioritized by threat to water quality. Those sites which pose the greatest threat can then be targeted for BMP implementation, inspection, and monitoring. This will

allow for limited resources to be most effective in reducing pollutant discharges from municipal sources. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3.a.(3)(a) in Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(3)(b) Threat to Water Quality Prioritization (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

At a minimum, the high priority municipal areas and activities shall include the following:

i Roads, Streets, Highways, and Parking Facilities.

ii Flood Management Projects and Flood Control Devices.

iii Areas and activities tributary to a Clean Water Act section 303(d) impaired water body or other environmentally sensitive area (as defined in section F.1.b.(2)(a)vii of this Order).

iv Municipal Waste Facilities.

- *Active or closed municipal landfills;*
- *Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewage collection systems;*
- *Municipal separate storm sewer systems;*
- *Incinerators;*
- *Solid waste transfer facilities;*
- *Land application sites;*
- *Uncontrolled sanitary landfills;*
- *Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles;*
- *Sites for disposing and treating sewage sludge; and*
- *Hazardous waste treatment, disposal, and recovery facilities;*

v *Other municipal areas and activities that the Copermittee determines may contribute a significant source pollutant load to the MS4.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: Identification of high priority municipal pollutant areas and activities allows for limited pollution reduction resources to be most effective. Targeting high priority municipal areas and activities for BMP implementation, inspection, and monitoring provides the greatest reduction in risk of degrading receiving waters per expenditure.

Items (i), (ii), and (iv) above are considered to be high priority sources since they are specifically addressed in Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(3-5). Regarding roads, highways, and parking facilities, the US EPA states "Road maintenance practices, especially snow management and road repair, and traffic are significant sources of

pollutants in storm water discharges. […] Municipal equipment yards and maintenance shops that support road maintenance activities can also be significant sources of pollutants" (1992). Regarding flood management projects and flood control devices, the US EPA states "Storm water management devices and structures that focus solely on water quantity are usually not designed to remove pollutants, and may sometimes harm aquatic habitat and aesthetic values" (1992). Regarding municipal waste facilities, the US EPA states "Applicants must describe programs that identify measures to monitor and reduce pollutants in storm water discharges from facilities that handle municipal waste, including sewage sludge. […] The types of facilities that should be included are: active or closed municipal waste landfills; publicly owned treatment works, including water and wastewater treatment plants; incinerators; municipal solid waste transfer facilities; land application sites; uncontrolled sanitary landfills; maintenance and storage yards for waste transportation fleets and equipment; sites for disposing or treating sludge from municipal treatment works; and other treatment, storage, or disposal facilities for municipal waste" (1992).

Areas and activities included in item (iii) are considered high priority due to their location in relation to CWA section 303(d) water bodies. Pollutant loading of these water bodies must be avoided to aid in their recovery and ensure against their further degradation. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3.a.(3)(b) in Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(4)(a) and F.3.a.(4)(b) BMP Implementation (Municipal) of the Jurisdictional Urban Runoff Management Program state the following:

> *(a) Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality municipal areas and activities (as determined under section F.3.a.(3)). The designated minimum BMPs for high threat to water quality municipal areas and activities shall be area or activity specific as appropriate.*
>
> *(b) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the threat to water quality rating) at each municipal area or activity within its jurisdiction. If particular minimum BMPs are infeasible for any specific area or activity, each Copermittee shall implement, or require implementation of other equivalent BMPs. Each Copermittee shall also implement any additional BMPs as are necessary to comply with this Order.*
>
> *i. Each Copermittee shall evaluate feasibility of retrofitting existing structural food control devices and retrofit where needed.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)

(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: Copermittees must reduce the discharge of pollutants to the MS4 to the maximum extent practicable. In order to achieve this level of pollution reduction in storm water discharges from municipal areas and activities, BMPs must be implemented. To ensure that adequate BMPs are utilized for various municipal areas and activities, each Copermittee shall designate and implement a set of minimum BMPs for high, medium, and low threat to water quality municipal areas and activities. The designated minimum BMPs will provide guidance as to the level of water quality protection required for various municipal areas and activities.

The US EPA recommends that Copermittees include in the proposed management program BMP measures for addressing municipal area and activities. Regarding public street, road, or highway BMPs, the US EPA states that "proposed management programs must include a description of practices for operation and maintenance of public streets, roads, and highways, and procedures for reducing the impact of runoff from these areas on receiving waters. […] Pollutants from traffic can be minimized by using nonstructural controls (e.g., traffic reduction and improved traffic management), structural controls (e.g., traditional and innovative BMPs), and changing maintenance activities" (1992).

Regarding flood management projects, the US EPA finds that flood management projects can be harmful to receiving waters, stating that "Storm water management devices and structures that focus solely on water quantity are usually not designed to remove pollutants, and may sometimes harm aquatic habitat and aesthetic values" (1992). As flood control structures and other elements of the MS4 age and retrofitting becomes necessary, opportunities for water quality improvements arise. Conveyance systems which take water quality consideration into account (such as grassed swales, vegetated detention ponds, etc.) can often cost less to construct than traditional concrete systems. Evaluation of the applicability of such systems during retrofitting must occur to ensure that pollutants in urban runoff are reduced to the maximum extent practicable. The US EPA supports utilizing BMPs for pollution reduction in flood management projects, stating that "The proposed management program must demonstrate that flood management projects take into account the effects on the water quality of receiving water bodies. […] Opportunities for pollutant reduction should be considered" (1992).

Regarding municipal waste facility BMPs, the US EPA states that "Procedures to evaluate, inspect, monitor, and establish control measures for municipal waste sites over the term of the NPDES permit should be described" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff

Management Program item F.3.a.(4)(a) in Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(4)(c) BMP Implementation (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall implement, or require implementation of, any additional controls for municipal areas and activities tributary to Clean Water Act section 303(d) impaired water bodies, coastal lagoons, or other environmentally sensitive areas necessary to comply with this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Discussion: CWA section 303(d) water bodies are water bodies which are not achieving the water quality objectives necessary to protect their beneficial uses. As discussed in Finding 3, urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. Since discharges which cause or contribute to an exceedance of water quality standards must be controlled and are prohibited (see section C.1. of Order No. 2001-01), discharges to CWA section 303(d) waterbodies of pollutants for which the waterbody is impaired must be controlled and are prohibited. Therefore, municipal areas and activities tributary to these water bodies must implement additional controls to ensure that they are not discharging the pollutants which are causing or contributing to the impairment of these water bodies.

With regards to coastal lagoons and other sensitive water bodies, additional controls are needed to protect these valuable and unique resources. In their Nonpoint Source Program Strategy and Implementation Plan, the SWRCB and California Coastal Commission support additional controls for critical coastal areas, stating "the State will seek to attain and maintain applicable water quality standards, and protect waters threatened by land uses, or by substantial expansion of existing land uses, by implementing additional management measures."

The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Program item F.3.a.(4)(c) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3.a.(5) Maintenance of Municipal Separate Storm Sewer System (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

(a) Each Copermittee shall implement a schedule of maintenance activities at all structural controls designed to reduce pollutant discharges to or from its MS4s and related drainage structures.

(b) Each Copermittee shall implement a schedule of maintenance activities for the municipal separate storm sewer system.

(c) The maintenance activities must, at a minimum, include:

i. Inspection and removal of accumulated waste (e.g. sediment, trash, debris and other pollutants) between May 1 and September 30 of each year;

ii. Additional cleaning as necessary between October 1 and April 30 of each year;

iii. Record keeping of cleaning and the overall quantity of waste removed;

iv. Proper disposal of waste removed pursuant to applicable laws;

v. *Measures to eliminate waste discharges during MS4 maintenance and cleaning activities.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: Maintenance is critical to the successful implementation of every URMP. The US EPA finds that "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices. […] The proposed program should provide for maintenance logs and identify specific maintenance activities for each class of control, such as removing sediment from retention ponds every five years, cleaning catch basins annually, and removing litter from channels twice a year. If maintenance activities are scheduled infrequently, inspections must be scheduled to ensure that the control is operating adequately. In cases where scheduled maintenance is not appropriate, maintenance should be based on inspections of the control structure or frequency of storm events. If maintenance depends on the results of

inspections or if it occurs infrequently, the applicant must provide an inspection schedule. The applicant should also identify the municipal department(s) responsible for the maintenance program" (1992). The maintenance schedule included in this item is based on the above US EPA recommendations. This maintenance schedule will help ensure that structural controls are in adequate condition to be effective year round but especially at the beginning of and throughout the rainy season.

Maintenance of municipal facilities, control structures, and the MS4 is considered so essential by US EPA that the requirement to conduct a maintenance program is specifically directed in both the Phase I and Phase II storm water regulations. In both cases, the maintenance programs must include a training component and have the ultimate goal of preventing pollutant runoff from municipal operations. Municipal activities should set a good example for all non-municipal personnel and the public.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.a.(5) in Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(6) Management of Pesticides, Herbicides, and Fertilizers (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

> *The Copermittees shall implement BMPs to reduce the contribution of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from municipal areas and activities to MS4s. Important municipal areas and activities include all municipal facilities, public rights-of-way, parks, recreational facilities, golf courses, cemeteries, botanical or zoological gardens and exhibits, landscaped areas, etc.*
>
> *Such BMPs shall include, at a minimum: (1) educational activities, permits, certifications and other measures for municipal applicators and distributors; (2) integrated pest management measures that rely on non-chemical solutions; (3) the use of native vegetation; (4) schedules for irrigation and chemical application; and (5) the collection and proper disposal of unused pesticides, herbicides, and fertilizers.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: Regarding the municipal use of pesticides, herbicides, and fertilizers, the US EPA finds that "The proposed program should include educational measures for the public and commercial applicators, and should include integrated pest management measures that rely on non-chemical solutions to pest control. The program should also describe how educational

materials will be developed and distributed. Applicants are encouraged to consider providing information for the collection and proper disposal of unused pesticides, herbicides, and fertilizers, or to establish their own program. […] In addition, applicants must include a discussion of controls for the application of pesticides, herbicides, and fertilizers in public rights-of-way and at municipal facilities. Planting low-maintenance vegetation, such as perennial ground covers, reduces pesticide and herbicide use. Native vegetation is often preferable because there is less need to apply fertilizers and herbicides, and to perform other forms of maintenance, such as mowing" (1992). Based on these US EPA recommendations, the SDRWQCB included Jurisdictional Urban Runoff Management Program item F.3.a.(6) in Order No. 2001-01. The SDRWQCB has discretion to include Jurisdictional Urban Runoff Management Program item F.3.a.(6) in Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(7) Inspection of Municipal Areas and Activities (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

> *At a minimum, each Copermittee shall inspect high priority municipal areas and activities annually. Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: The USEPA finds that the municipal areas and activities listed in section F.3.a.(3) of Order No. 2001-01 can be a significant source of pollutants in urban runoff (see Discussion for F.3.a.(3) above). Since these municipal areas and activities can be a significant source of pollutants, annual inspections are necessary to ensure that proper measures are being undertaken to reduce pollutant discharges to the maximum extent practicable. The USEPA supports inspections of municipal areas and activities, stating "Applicants must describe programs that identify measures to monitor and reduce pollutants in storm water discharges from facilities that handle municipal waste, including sewage sludge. […] The types of facilities that should be included are: active or closed municipal waste landfills; publicly owned treatment works, including water and wastewater treatment plants; incinerators; municipal solid waste transfer facilities; land application sites; uncontrolled sanitary landfills; maintenance and storage yards for waste transportation fleets and equipment; sites for disposing or treating sludge from municipal treatment works; and other treatment, storage, or disposal facilities for municipal waste" (1992). The

USEPA further states that "Procedures to evaluate, inspect, monitor, and establish control measures for municipal waste sites over the term of the NPDES permit should be described" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3.a.(7) in Order No. 2001-01 under the broad legal authority cited above.

F.3.a.(8) Enforcement of Municipal Areas and Activities (Municipal) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall enforce its storm water ordinance for all municipal areas and activities as necessary to maintain compliance with this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.a. Municipal (Existing Development) of Order No. 2001-01.

Discussion: When a Copermittee determines a violation of its storm water ordinance, it must pursue correction of the violation. A critical aspect of the correction of violations is enforcement of ordinances. Enforcement increases the probability of correction of a violation. Regarding inspection and enforcement measures, the US EPA states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3.a.(8) in Order No. 2001-01 under the broad legal authority cited above.

F.3.b. INDUSTRIAL (EXISTING DEVELOPMENT)

In addition to the underlying broad legal authority citations listed above in section VII. of this Fact Sheet/Technical Report, the following specific legal authority items also generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01. Other specific legal authority items applicable only to distinct directives of Jurisdictional Urban Runoff Management Program item F.3.b. are provided as necessary.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) provides that the proposed management program include "A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and

recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) provides that the Copermittee must "identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

F.3.b. Industrial (Existing Development) for the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement an Industrial (Existing Development) Component to reduce pollutants in runoff from all industrial sites. At a minimum the industrial component shall address:

F.3.b.(1) Pollution Prevention
F.3.b.(2) Source Identification
F.3.b.(3) Threat to Water Quality Prioritization
F.3.b.(4) BMP Implementation
F.3.b.(5) Monitoring of Industrial Sites
F.3.b.(6) Inspection of Industrial Sites
F.3.b.(7) Enforcement Measures for Industrial Sites
F.3.b.(8) Reporting of Non-compliant Sites

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Discussion: CWA sections 402(p)(3)(B)(ii-iii) require each Copermittee to prohibit non-storm water discharges into its MS4 and to reduce the discharge of pollutants to the maximum extent practicable for all urban land uses. The purpose of these two broad requirements is to minimize the short and long-term impacts of urban runoff on receiving water quality. Land used for industrial activities is clearly identified in the federal regulations as one of several high priority land uses from which pollutants in urban runoff discharges must be reduced to the maximum extent practicable by each Copermittee. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) requires the development of a proposed management program to reduce the discharge of pollutants in storm water to the maximum extent practicable. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) requires that this program include a component which addresses industrial sites.

Due to their numerous potential pollutant sources, industrial sites are relatively high risk areas for pollutant discharges to storm water. In order to control the discharge of pollutants from industrial sites to the maximum extent practicable, implementation of BMPs is necessary. As discussed in Finding 12, BMPs effectively reduce pollutants in urban runoff by emphasizing pollution prevention and source controls, followed by treatment controls. The industrial existing development component will provide a program for the development and implementation of BMPs to address pollutants in storm water discharges from industrial sites. The US EPA supports such a program, stating "NPDES permits for MS4s will establish responsibilities for municipal system operators to control pollutants from industrial storm water discharged through their system" (1992).

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.3.b. in Order No. 2001-01 under the broad legal authority cited above.

F.3.b.(1) Pollution Prevention (Industrial) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement pollution prevention methods in its Industrial (Existing Development) Component and shall require its use by industry.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Discussion: Each Copermittee must develop a program to reduce the discharge of pollutants to and from its MS4 to the maximum extent practicable for all urban land uses, including industrial land uses. In order to achieve this level of pollution reduction, BMPs must be implemented. Pollution prevention, the reduction or elimination of pollutant generation at its source, is an essential aspect of BMPs. By limiting the generation of pollutants, less pollutants are available to be washed from industrial sites, resulting in reduced pollutant loads in storm water discharges from these sites. In addition, there is no need to control or treat pollutants which are not initially generated. Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media. In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. Since pollution prevention is an effective and efficient means for reducing pollutant loads in storm water

runoff, pollution prevention methods are an important aspect of BMPs to be included in the industrial existing development component. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.a in Order No. 2001-01 under the broad legal authority cited above.

F.3.b.(2) Source Identification (Industrial) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall develop and update annually a watershed based inventory of all industrial sites within its jurisdiction regardless of site ownership. This requirement is applicable to all industrial sites regardless of whether the industrial site is subject to the California statewide General NPDES Permit for Storm Water Discharges Associated With Industrial Activities, Except Construction (hereinafter General Industrial Permit) or other individual NPDES permit.

The inventory shall include the following minimum information for each industrial site: name; address; and a narrative description including SIC codes which best reflects the principal products or services provided by each facility. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that the Copermittee "Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity."

Discussion: Due to their numerous potential pollutant sources, industrial sites are high risk areas for pollutant discharges to storm water. In order to prohibit non-storm water discharges, reduce industrial pollutant sources to the maximum extent practicable, and ensure that adequate BMPs are implemented, each Copermittee must first identify all industrial sites within their jurisdiction. Development of an inventory of industrial sites within a watershed will help identify potential industrial sources of pollutants in storm water. By assessing information provided in the inventory (such as principal products, services provided, and location), sites with the highest risk to receiving water quality can be identified, and priority for inspection, monitoring, and enforcement can be placed on those sites. By focusing inspection and monitoring on high priority sites, the effectiveness of limited inspection and monitoring resources can be maximized. The SDRWQCB

has discretion to require inventories of industrial sites in Jurisdictional Urban Runoff Program item F.3.b of Order No. 2001-01 under the broad and specific legal authority above.

F.3.b.(3) Threat to Water Quality Prioritization (Industrial) of the Jurisdictional Urban Runoff Management Program states the following:

> *(a) To establish priorities for industrial oversight activities under this Order, the Copermittee shall prioritize each watershed based inventory in F.3.b.(2) above by threat to water quality and update annually. Each industrial site shall be classified as high, medium, or low threat to water quality. In evaluating threat to water quality each Copermittee shall consider (1) type of industrial activity (SIC Code); (2) materials used in industrial processes; (3) wastes generated; (4) pollutant discharge potential; (5) non-storm water discharges; (6) size of facility; (7) proximity to receiving water bodies; (8) sensitivity of receiving water bodies; (9) whether the industrial site is subject to the statewide General Industrial Permit; and (10) any other relevant factors.*
>
> (b) *At a minimum the high priority industrial sites shall include industrial facilities that are subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA); industrial facilities tributary to a Clean Water Act section 303(d) impaired water body or other environmentally sensitive area (as defined in section F.1.b.(2)(a)(vii of this Order); facilities subject to the statewide General Industrial Permit; and all other industrial facilities that the Copermittee determines are contributing significant pollutant loading to its MS4, regardless of whether such facilities are covered under the statewide General Industrial Permit or other NPDES permit.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that the Copermittee "Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity."

Discussion: Due to their numerous pollutant sources, industrial sites are high risk areas for pollutant discharges to storm water. Development of an inventory of industrial sites within a watershed will help identify potential sources of pollutants in urban runoff. By assessing information provided in the inventory (such as principal products or services provided by the facility), sites can be prioritized by threat to water quality. Those sites

which pose the greatest threat can then be targeted for inspection and monitoring. This will allow for limited inspection and monitoring time to be most effective. Regarding industrial site priority designation, the US EPA states that "When municipalities develop criteria for identifying additional priority industrial facilities, they are advised to consider, at a minimum:

- The type of industrial activity (SIC codes can help characterize the type of industrial activity);
- The use and management of chemicals or raw products at the facility and the likelihood that storm water discharge from the site will be contaminated; and
- The size and location of the facility in relation to sensitive watersheds" (1992).

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.b.(3) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3.b.(4)(a) and F.3.b.(4)(b) BMP Implementation (Industrial) of the Jurisdictional Urban Runoff Management Program states the following:

(a) *Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality industrial sites (as determined under section F.3.b.(3)). The designated minimum BMPs for high threat to water quality industrial sites shall be industry and site specific as appropriate.*

(b) *Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the site's threat to water quality rating) at each industrial site within its jurisdiction. If particular minimum BMPs are infeasible at any specific site, each Copermittee shall implement, or require implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order including BMPs which are more stringent than those required under the statewide General Industrial Permit.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Discussion: Copermittees must reduce the discharge of pollutants to the MS4 from industrial sites to the maximum extent practicable. In order to achieve this level pollution reduction in storm water discharges from industrial sites, BMPs must be designated and implemented. To ensure that adequate BMPs are utilized at the industrial sites, each Copermittee shall designate and require implementation of a set of minimum BMPs for high,

medium, and low threat to water quality industrial sites. The designated minimum BMPs will provide guidance on level of water quality protection required. The US EPA recommends that Copermittees provide BMP guidance to industrial facilities, stating "the applicant should suggest procedures for requiring pollutant control measures in runoff from priority industrial facilities. Applicants should provide information to the industrial facilities that discharge to the MS4s and industry-specific guidance on appropriate control measures that industries discharging to the systems should follow" (1992).

In order to adequately protect receiving water quality and allow Copermittees to meet their permit responsibilities under Order No. 2001-01, additional BMPs may be required, including BMPs more stringent than those required under the state wide General Industrial Permit. Regarding additional BMP requirements of this type, the US EPA finds that "nothing in the Federal regulations would prohibit the municipality from requiring additional controls beyond the permit requirements for industrial activities. For this reason, the EPA recommends that municipal applicants incorporate a provision in the proposed storm water management program that allows the municipality to require priority industrial facilities to implement the controls necessary for the municipality to meet its permit responsibilities" (1992).

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program items F.3.b.(4)(a) and F.3.b.(4)(b) in Order No. 2001-01 under the broad legal authority cited above.

F.3.b.(4)(c) BMP Implementation (Industrial) of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall implement, or require implementation of, additional controls for industrial sites tributary to CWA Section 303(d) impaired water bodies, coastal lagoons, or other environmentally sensitive areas as necessary to comply with this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Discussion: CWA section 303(d) water bodies are water bodies which are not achieving the water quality objectives necessary to protect their beneficial uses. As discussed in Finding 3, urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. Since discharges which cause or contribute to an exceedance of water quality standards must be controlled and are also prohibited (see section C.1. of Order No. 2001-01), discharges to CWA section 303(d) water bodies of pollutants for which the waterbody is impaired must be controlled and prohibited. Therefore, municipal areas and activities tributary to these water bodies must implement additional controls to ensure that they are not discharging the pollutants which are causing or contributing to the impairment of these water bodies.

Regarding coastal lagoons and other sensitive water bodies, additional controls are needed to protect these valuable and unique resources. In their Nonpoint Source Program Strategy and Implementation Plan, the SWRCB and California Coastal Commission support additional controls for critical coastal areas, stating "the State will seek to attain and maintain applicable water quality standards, and protect waters threatened by land uses, or by substantial expansion of existing land uses, by implementing additional management measures."

The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Program item F.3.b.(4)(c) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3.b.(5) Monitoring of Industrial Sites (Industrial) of the Jurisdictional Urban Runoff Management Program item F.3.e. states the following:

(a) Each Copermittee shall conduct, or require industry to conduct, a monitoring program for runoff from each high threat to water quality industrial site (identified in F.3.b.(3) above).

(b) At a minimum, the monitoring program shall provide quantitative data from two storm events per year on the following constituents:

- *i. Any pollutant listed in effluent guidelines subcategories where applicable;*
- *ii. Any pollutant for which an effluent limit has been established in an existing NPDES permit for the facility;*
- *iii. Oil and grease or Total Organic Carbon (TOC);*
- *iv. pH;*
- *v. Total suspended solids (TSS);*
- *vi. Specific conductance; and*
- vii. *Toxic chemicals and other pollutants that are likely to be present in storm water discharges.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(2) provides that the proposed management program shall "Describe a monitoring program for storm water discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C) of this section, to be implemented during the term of the permit, including the submission of quantitative data on the following constituents: any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD, pH, BOD_5, TSS, total phosphorus, total Kjeldhal nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7)(iii) and (iv)."

Discussion: The purpose of the monitoring program is to provide the information needed by each Copermittee to assess the effectiveness of its Industrial BMP Program. Quantitative data is required for two storm events per year in order to identify potential trends and/or anomalies in the data. The Copermittee may be able to obtain this monitoring information from some industrial sites by requesting submittal of the Annual Reports required under the General Industrial Storm Water Permit. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.b.(5) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3.b.(6) Inspection of Industrial Sites (Industrial) of the Jurisdictional Urban Runoff Management Program states the following:

(a) Each Copermittee shall conduct industrial site inspections for compliance with its ordinances, permits, and this Order. Inspections shall include review of BMP implementation plans.

(b) Each Copermittee shall establish inspection frequencies and priorities as determined by the threat to water quality prioritization described in F.3.b.(3) above. Each Copermittee shall inspect high priority industrial sites, at a minimum:

i. Annually

OR

ii. Bi-annually for any site that the responsible Copermittee certifies in a written statement to the SDRWQCB all of the following (certified statements may be submitted to the SDRWQCB at any time for one or more sites):

- *Copermittee has record of industrial site's Waste Discharge Identification Number (WDID#) documenting industrial site's coverage under the statewide General Industrial Permit; and*
- *Copermittee has reviewed the industrial site's Storm Water Pollution Prevention Plan (SWPPP); and*
- *Copermittee finds SWPPP to be in compliance with all local ordinances, permits, and plans; and*
- *Copermittee finds that the SWPPP is being properly implemented on site.*

Each Copermittee shall inspect medium and low threat to water quality industrial sites as needed.

(c) Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

(d) To the extent that the SDRWQCB has conducted an inspection of a high priority industrial site during a particular year, the requirement for the responsible Copermittee to inspect this site during the same year will be satisfied.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Discussion: Routine inspections provide an effective means by which Copermittees can evaluate compliance with their ordinances. Inspections are especially important at high risk areas for pollutant discharges, such as industrial and construction sites. Industrial site inspection frequencies are to be based on threat to water quality prioritization. For example, industrial sites which are considered a high threat to water quality are to be given a high priority for inspection. This allows for limited inspection resources to be most effective. Annual or bi-annual inspection of high threat sites is necessary to ensure that changes to the site which may be detrimental to water quality are identified and addressed.

Review of a facility's Storm Water Pollution Prevention Plan (SWPPP) can be an effective tool in inspecting the facility's storm water controls. The US EPA recommends that municipalities review SWPPPs during inspections when it states "Municipalities are urged to evaluate pollution prevention plans and discharge monitoring data collected by the industrial facility to ensure that the facility is in compliance with its NPDES storm water permit. Site inspections should include (1) an evaluation of the pollution prevention plan and any other pertinent documents, and (2) an onsite visual inspection of the facility to evaluate the potential for discharges of contaminated storm water from the site and to assess the effectiveness of the pollution prevention plan" (1992).

Regarding industrial site inspections, the US EPA finds that "The proposed management program should describe the inspection procedures that will be followed.[…] Proposed management programs should address minimum frequency for routine inspections. For example, how often, how much of the site, and how long an inspection may take are appropriate to explain in this proposed management program component. Applicants

should also describe procedures for conducting inspections and provide an inspector's checklist" (1992). The US EPA also finds that follow-up actions are to be implemented based upon site inspection findings: "The results of inspection may be used as a basis for requiring storm water management controls and enhanced pollution prevention measures" (1992).

Due to the large number of industrial sites within the region, sites which have been inspected by the SDRWQCB do not need to be re-inspected by a Copermittee within the same year. This practice will increase collaboration between the SDRWQCB and the Copermittees for industrial site inspections. Collaboration between the SDRWQCB and the Copermittees can provide for more efficient and effective overall inspection of industrial sites within the region. Regarding collaboration for inspection of industrial sites, US EPA states "The storm water regulations envision that NPDES permitting authorities and municipal operators will cooperate to develop programs to monitor and control pollutants in storm water discharges to municipal systems from various sites that handle waste and certain industrial facilities" (1992).

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.b.(6) in Order No. 2001-01 under the broad legal authority cited above.

F.3.b.(7) Enforcement of Industrial Sites (Industrial) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall enforce its storm water ordinance at all industrial sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include sanctions to ensure compliance. Sanctions shall include for example: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Discussion: The Copermittee is ultimately responsible for discharges to and from their MS4. Each Copermittee must therefore develop and enforce storm water ordinances in order reduce pollutant discharges to the MS4 to the maximum extent practicable and comply with its permit responsibilities. These ordinances must be applied at all industrial sites to ensure that pollutant discharges to the MS4 are reduced to the maximum extent practicable and permit requirements are met. To this effect, the US EPA "recommends that municipal applicants incorporate a provision in the proposed management program that allows the municipality to require priority industrial facilities to implement the controls necessary for the municipality to meet its permit responsibilities" (1992). Regarding enforcement at industrial sites, the US EPA further states "The municipality, as a permittee, is responsible for compliance with its permit and must have authority to implement the conditions in its permit. To comply with its permit, a municipality must have the authority to hold dischargers accountable for their contributions to separate storm sewers" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.b.(7) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3.b.(8) Reporting of Non-compliant Sites (Industrial) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall provide oral notification to the SDRWQCB of non-compliant sites within its jurisdiction within 24 hours of the incidence of noncompliance, as required under section R.1 (and B.7 of Attachment C) of this Order. Such oral notification shall be followed up by a written report to be submitted to the SDRWQCB within 5 days of the incidence of non-compliance as required under section R.1 (and B.7 of Attachment C) of this Order. Sites are considered non-compliant when one or more violations of local ordinances, permits, plans, or this Order exist on the site.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(C) and 40 CFR 122.26(d)(2)(iv)(C)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.3.b. Industrial (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermitee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.44(I)(6) states "The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of non-compliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance."

Discussion: Follow-up with non-compliant industrial sites is essential to ensure that the site has taken adequate corrective measures to achieve compliance. To help ensure that compliance has been achieved, the Copermittees shall report non-compliant industrial sites to the SDRWQCB. The SDRWQCB can then participate in follow-up efforts to assure that the industrial site is in compliance. The US EPA supports this type of collaboration when it states "the municipality will help EPA and authorized NPDES states: [...] Inspect and monitor industrial facilities to verify that the industries discharging storm water to the municipal systems are in compliance with their NPDES storm water permit, if required" (1992). Notification of non-compliant sites is a common requirement of all NPDES permits under Federal NPDES regulation 40 CFR 122.44(I)(6). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.b.(7) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3.c. COMMERCIAL (EXISTING DEVELOPMENT)

In addition to the underlying broad legal authority citations listed above in section VII. of this Fact Sheet/Technical Report, the following specific legal authority item also generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.c. Commercial (Existing Development) of Order No. 2001-01. Other specific legal authority items applicable only to distinct directives of Jurisdictional Urban Runoff Management Program item F.3.c. are provided as necessary.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

F.3.c. Commercial (Existing Development) of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall implement a Commercial (Existing Development) Component to reduce pollutants in runoff from commercial sites. At a minimum the commercial component shall address:*
>
> > *F.3.c.(1) Pollution Prevention*
> > *F.3.c.(2) Source Identification*
> > *F.3.c.(3) BMP Implementation*
> > *F.3.c.(4) Inspection of Commercial Sites and Sources*
> > *F.3.c.(5) Enforcement Measures for Commercial Sites and Sources*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.c. Commercial (Existing Development) of Order No. 2001-01.

Discussion: CWA sections 402(p)(3)(B)(ii-iii) require each Copermittee to prohibit non-storm water discharges into its MS4 and to reduce the discharge of pollutants to the maximum extent practicable for all urban land uses. The purpose of these two broad requirements is to minimize the short and long-term impacts of urban runoff on receiving water quality. Land used for commercial activities is clearly identified in the federal regulations as one of several high priority land uses from which pollutants in urban runoff discharges must be reduced to the maximum extent practicable by each Copermittee. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) requires the development of a proposed management program to reduce the discharge of pollutants in storm water to the maximum extent practicable. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) requires that this program include a component which addresses commercial sites and sources.

Commercial sites and sources have the potential to be significant sources of pollutants in urban runoff. To reduce the discharge of pollutants in urban runoff from commercial sites to the maximum extent practicable, BMPs must be implemented. As discussed in Finding 12, BMPs effectively reduce pollutants in urban runoff by emphasizing pollution prevention and source controls, followed by treatment controls. The commercial existing development component will provide a program for the development and implementation of BMPs to address pollutants in storm water discharges from commercial sites and activities.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.c. in Order No. 2001-01 under the broad legal authority cited above.

F.3.c.(1) Pollution Prevention (Commercial) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement pollution prevention methods in its Commercial (Existing Development) Component and shall require its use by commerce.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.c. Commercial (Existing Development) of Order No. 2001-01.

Discussion: Each Copermittee must develop a program to reduce the discharge of pollutants to and from its MS4 to the maximum extent practicable. In order to achieve this level of pollution reduction, BMPs must be implemented. As discussed in Finding 12, pollution prevention (the reduction or elimination of pollutant generation at its source) is an essential aspect of BMP programs. By limiting the generation of pollutants, less pollutants are available to be washed from commercial sites and sources, resulting in reduced pollutant loads in storm water discharges from these sites and sources. In addition, there is no need to control or treat pollutants which are not initially generated. Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media. In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. Since pollution prevention is an effective and efficient means for reducing pollutant loads in storm water runoff, pollution prevention methods are an important aspect of BMPs to be included in the commercial existing development component of the Jurisdictional URMP. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.c.(1) in Order No. 2001-01 under the broad legal authority cited above.

F.3.c.(2) Source Identification (Commercial) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall develop and update annually an inventory of the following high priority threat to water quality commercial sites/sources:

(a) Automobile mechanical repair, maintenance, fueling, or cleaning;
(b) Airplane mechanical repair, maintenance, fueling, or cleaning;

(c) Boat mechanical repair, maintenance, fueling, or cleaning;
(d) Equipment repair, maintenance, fueling, or cleaning;
(e) Automobile & other vehicle body repair or painting;
(f) Mobile automobile or other vehicle washing;
(g) Automobile (or other vehicle) parking lots and storage facilities;
(h) Retail or wholesale fueling;
(i) Pest control services;
(j) Eating or drinking establishments;
(k) Mobile carpet, drape or furniture cleaning;
(l) Cement mixing or cutting;
(m) Masonry;
(n) Painting and Coating;
(o) Botanical or zoological gardens and exhibits;
(p) Landscaping;
(q) Nurseries and greenhouses;
(r) Golf courses, parks and other recreational areas/facilities;
(s) Cemeteries;
(t) Pool and fountain cleaning;
(u) Marinas;
(v) Port-a-Potty servicing;
(w) *Other commercial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4; and*
(x) *Any commercial site or source tributary to a Clean Water Act section 303(d) impaired water body or other environmentally sensitive area (as defined in F.1.b(2)(a)vii of this Order).*

The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.c. Commercial (Existing Development) of Order No. 2001-01.

Discussion: In order to prohibit non-storm water discharges, reduce commercial pollutant sources to the maximum extent practicable, and ensure that adequate BMPs are implemented, Copermittees must first identify all high priority threat to water quality commercial pollutant sources. Based on the number of complaints received by the SDRWQCB and the Copermittees, the types of commercial sites and activities listed in item F.3.c.(2) are potential high risk areas for pollutant discharges to storm water. The sites and activities are identified as such due to their frequent use of substances often found to be present as pollutants in urban runoff, combined with frequent mismanagement of runoff from the sites and activities. Therefore, development of an inventory of these commercial sites within a watershed will help identify the location of potential sources of pollutants in storm water. Pollutants found to be present in receiving waters can then be traced to the sites which frequently use such substances. In this manner an

inventory of commercial sites can help in targeting commercial sites for inspection, monitoring, and potential enforcement. This will allow for limited inspection, monitoring, and enforcement time to be most effective. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.c.(2) in Order No. 2001-01 under the broad legal authority cited above.

F.3.c.(3)(a) and F.3.c.(3)(b) BMP Implementation (Commercial) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall designate a set of minimum BMPs for the high priority threat to water quality commercial sites/sources (listed above in section F.3.c.(2)). The designated minimum BMPs for the high threat to water quality commercial sites shall be source and site specific as appropriate.

Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs at each high priority threat to water quality commercial site/source within its jurisdiction. If particular minimum BMPs are infeasible for any specific site/source, each Copermittee shall implement, or require the implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.c. Commercial (Existing Development) of Order No. 2001-01.

Discussion: Copermittees must reduce the discharge of pollutants in storm water from commercial sites and activities to the maximum extent practicable. To achieve this level of pollutant reduction, BMPs must be implemented (see Finding 11). Designation of a set of minimum BMPs for high threat commercial sites will help ensure that appropriate BMPs are implemented at the sites. These minimum BMPs will also serve as guidance as to the level of water quality protection required. While minimum BMPs will be required at all high threat commercial sites, implementation of particular minimum BMPs will be site and source specific in order to address different conditions at various sites. BMPs to be implemented must comply with Order No. 2001-01. As such, additional site specific BMPs may be necessary to comply with other aspects of Order 2001-01. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program items F.3.c.(3)(a) and F.3.c.(3)(b) in Order No. 2001-01 under the broad legal authority cited above.

F.3.c.(3)(c) BMP Implementation (Commercial) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement, or require implementation of, additional controls for commercial sites tributary to CWA section 303(d) impaired water bodies, coastal lagoons, or other environmentally sensitive areas as necessary to comply with this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.c. Commercial (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Discussion: CWA section 303(d) water bodies are water bodies which are not achieving the water quality objectives necessary to protect their beneficial uses. As discussed in Finding 3, urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. Since discharges which cause or contribute to an exceedance of water quality standards must be controlled and are also prohibited (see section C.1. of Order No. 2001-01), discharges to CWA section 303(d) water bodies of pollutants for which the waterbody is impaired must be controlled and prohibited. Therefore, commercial sites and activities tributary to these water bodies must implement additional controls to ensure that they are not discharging the pollutants which are causing or contributing to the impairment of these water bodies.

Regarding coastal lagoons and other sensitive water bodies, additional controls are needed to protect these valuable and unique resources. In their Nonpoint Source Program Strategy and Implementation Plan, the SWRCB and California Coastal Commission support additional controls for critical coastal areas, stating "the State will seek to attain and maintain applicable water quality standards, and protect waters threatened by land uses, or by substantial expansion of existing land uses, by implementing additional management measures."

The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Program item F.3.c.(3)(c) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3.c.(4) Inspection of Commercial Sites and Sources (Commercial) and F.3.c.(5) Enforcement of Commercial Sites and Sources (Commercial) of the Jurisdictional Urban Runoff Management Program state the following:

> *Each Copermittee shall inspect high priority commercial sites and sources as needed. Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.*
>
> *Each Copermittee shall enforce its storm water ordinance for all commercial sites and sources as necessary to maintain compliance with this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.c. Commercial (Existing Development) of Order No. 2001-01.

Discussion: BMPs must be implemented for commercial sites and activities to reduce the discharge of pollutants from the sites and activities to the maximum extent practicable. Inspection of commercial sites is necessary to ensure that implemented BMPs are adequate. As discussed in Finding 24, inspections provide a necessary means by which Copermittees can evaluate compliance with their ordinances and requirements of Order No. 2001-01. Inspections are especially important for high risk commercial sites and activities, such as commercial sites and activities where urban runoff is not properly managed. If inspections identify noncompliance conditions, enforcement of storm water ordinance is also necessary to ensure adequate BMP implementation. Regarding inspection and enforcement measures, the US EPA states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program items F.3.c.(4) and F.3.c.(5) in Order No. 2001-01 under the broad legal authority cited above.

F.3.d. RESIDENTIAL (EXISTING DEVELOPMENT)

In addition to the underlying broad legal authority citations listed above in section VII. of this Fact Sheet/Technical Report, the following specific legal authority item also generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.d. Residential (Existing Development) of Order No. 2001-01. Other specific legal authority items applicable only to distinct directives of

Jurisdictional Urban Runoff Management Program item F.3.d. are provided as necessary.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

F.3.d. Residential (Existing Development) of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement a Residential (Existing Development) Component to prevent or reduce pollutants in runoff from all residential land use areas and activities. At a minimum the residential component shall address:

F.3.d.(1) Pollution Prevention
F.3.d.(2) Threat to Water Quality Prioritization
F.3.d.(3) BMP Implementation
F.3.d.(4) Enforcement of Residential Areas and Activities

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.d. Residential (Existing Development) of Order No. 2001-01.

Discussion: CWA sections 402(p)(3)(B)(ii-iii) require each Copermittee to prohibit non-storm water discharges into its MS4 and to reduce the discharge of pollutants to the maximum extent practicable for all urban land uses. The purpose of these two broad requirements is to minimize the short and long-term impacts of urban runoff on receiving water quality. Land used for residential activities is clearly identified in the federal regulations as one of several high priority land uses from which pollutants in urban runoff discharges must be reduced to the maximum extent practicable by each Copermittee. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) requires the development of a proposed management program to reduce the discharge of pollutants in storm water to the maximum extent practicable. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) requires that this program include a component which addresses residential areas and activities.

Residential areas and activities have the potential to be significant sources of pollutants in urban runoff. To reduce the discharge of pollutants in urban

runoff from residential areas and activities to the maximum extent practicable, BMPs must be implemented. As discussed in Finding 12, BMPs effectively reduce pollutants in urban runoff by emphasizing pollution prevention and source controls, followed by treatment controls. The residential existing development component will provide a program for the development and implementation of BMPs to address pollutants in storm water discharges from residential areas and activities.

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.c. in Order No. 2001-01 under the broad legal authority cited above.

F.3.d.(1) Pollution Prevention (Residential) for the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall include pollution prevention methods in its Residential (Existing Development) Component and shall encourage their use by all residents.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.d. Residential (Existing Development) of Order No. 2001-01.

Discussion: Each Copermittee must develop a program to reduce the discharge of pollutants to and from its MS4 to the maximum extent practicable. In order to achieve this level of pollution reduction, BMPs must be implemented. As discussed in Finding 12, pollution prevention (the reduction or elimination of pollutant generation at its source) is an essential aspect of BMP programs. By limiting the generation of pollutants, less pollutants are available to be washed from residential areas and activities, resulting in reduced pollutant loads in storm water discharges from these areas and activities. In addition, there is no need to control or treat pollutants which are not initially generated. Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media. In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. Since pollution prevention is an effective and efficient means for reducing pollutant loads in storm water runoff, pollution prevention methods are an important aspect of BMPs to be included in the residential existing development component of the Jurisdictional URMP. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.d.(1) in Order No. 2001-01 under the broad legal authority cited above.

F.3.d.(2) Threat to Water Quality Prioritization (Residential) for the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall identify high priority residential areas and activities. At a minimum, these shall include:*
>
> - *Automobile repair and maintenance;*
> - *Automobile washing;*
> - *Automobile parking;*
> - *Home and garden care activities and product use (pesticides, herbicides, and fertilizers);*
> - *Disposal of household hazardous waste (e.g., paints, cleaning products);*
> - *Disposal of pet waste;*
> - *Disposal of green waste;*
> - *Any other residential source that the Copermittee determines may contribute a significant pollutant load to the MS4; and*
> - *Any residence tributary to a Clean Water Act section 303(d) impaired water body or other environmentally sensitive area (as defined in F.1.b.(2)(a)vii of this Order).*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.d. Residential (Existing Development) of Order No. 2001-01.

Discussion: The above residential areas and activities are identified as high priority threats to water quality due to their wide distribution, their association with pollutants of concern in urban runoff, and their historical mismanagement of associated urban runoff. Identification of high priority residential areas and activities will help focus BMP implementation efforts on these areas and activities. By focusing efforts on high priority areas and activities, the greatest potential for water quality improvements will result. Therefore, limited Copermittee staff time will be focused where it can be most effective. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.d.(2) in Order No. 2001-01 under the broad legal authority cited above.

F.3.d.(3)(a) and F.3.d.(3)(b) BMP Implementation (Residential) for the Jurisdictional Urban Runoff Management Program state the following:

> *(a) Each Copermittee shall designate a set of minimum BMPs for high threat to water quality residential areas and activities (as required under section F.3.d.(2)). The designated minimum BMPs for high threat to water quality municipal areas and activities shall be area or activity specific.*
>
> *(b) Each Copermittee shall require implementation of the designated minimum BMPs for high threat to water quality residential areas and activities. If particular minimum BMPs*

are infeasible for any specific site/source, each Copermittee shall require implementation of other equivalent BMPs. Each Copermittee shall also implement, or require implementation of, any additional BMPs as are necessary to comply with this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.d. Residential (Existing Development) of Order No. 2001-01.

Discussion: Copermittees must reduce the discharge of pollutants in storm water from residential areas and activities to the maximum extent practicable. To achieve this level of pollutant reduction, BMPs must be implemented (see Finding 11). Designation of a set of minimum BMPs for high threat residential areas and activities will help ensure that appropriate BMPs are implemented. These minimum BMPs will also serve as guidance as to the level of water quality protection required. While minimum BMPs will be required for all high threat residential areas and activities, implementation of particular minimum BMPs will be site and source specific in order to address different conditions for various areas and activities. BMPs to be implemented must comply with Order No. 2001-01. As such, additional site specific BMPs may be necessary to comply with other aspects of Order 2001-01. The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program items F.3.d.(3)(a) and F.3.d.(3)(b) in Order No. 2001-01 under the broad legal authority cited above.

F.3.d.(3)(c) BMP Implementation (Residential) for the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement, or require implementation of, any additional controls for residential areas and activities tributary to CWA Section 303(d) impaired water bodies, coastal lagoons, or other environmentally sensitive areas as necessary to comply with this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.d. Residential (Existing Development) of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either

conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Discussion: CWA section 303(d) water bodies are water bodies which are not achieving the water quality objectives necessary to protect their beneficial uses. As discussed in Finding 3, urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. Since discharges which cause or contribute to an exceedance of water quality standards must be controlled and are also prohibited (see section C.1. of Order No. 2001-01), discharges to CWA section 303(d) water bodies of pollutants for which the waterbody is impaired must be controlled and prohibited. Therefore, residential areas and activities tributary to these water bodies must implement additional controls to ensure that they are not discharging the pollutants which are causing or contributing to the impairment of these water bodies.

Regarding coastal lagoons and other sensitive water bodies, additional controls are needed to protect these valuable and unique resources. In their Nonpoint Source Program Strategy and Implementation Plan, the SWRCB and California Coastal Commission support additional controls for critical coastal areas, stating "the State will seek to attain and maintain applicable water quality standards, and protect waters threatened by land uses, or by substantial expansion of existing land uses, by implementing additional management measures."

The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Program item F.3.d.(3)(c) in Order No. 2001-01 under the broad and specific legal authority cited above.

F.3.d.(4) Enforcement of Residential Areas and Activities (Residential) for the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall enforce its storm water ordinance for all residential areas and activities as necessary to maintain compliance with this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) generally applies to all directives under Jurisdictional Urban Runoff Management Program item F.3.d. Residential (Existing Development) of Order No. 2001-01.

Discussion: As discussed in Finding 24, enforcement of storm water ordinances, permits, and plans is an essential aspect of a Jurisdictional URMP. Enforcement measures increase the probability that non-compliance situations will not occur or will be corrected. Regarding enforcement measures, the US EPA states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Program item F.3.d.(4) in Order No. 2001-01 under the broad legal authority cited above.

F.4. EDUCATION COMPONENT

F.4. Education Component of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement an Education Component using all media as appropriate to (1) measurably increase the knowledge of the target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to measurably change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment. At a minimum the education component shall address the following target communities:

- *Municipal Departments and Personnel*
- *Construction Site Owners and Developers*
- *Industrial Owners and Operators*
- *Commercial Owners and Operators*
- *Residential Community, General Public, and School Children*
- *Quasi-Governmental Agencies/Districts (i.e., educational institutions, water districts, sanitation districts, etc.)*

F.4.a. All Target Communities

At a minimum the Education Program for each target audience shall contain information on the following topics where applicable:

- *State and Federal water quality laws*
- *Requirements of local municipal permits and ordinances (e.g., storm water and grading ordinances and permits)*
- *Impacts of urban runoff on receiving waters*
- *Watershed concepts (i.e., stewardship, connection between inland activities and coastal problems, etc.)*
- *Distinction between MS4s and sanitary sewers*
- *Importance of good housekeeping (e.g., sweeping impervious surfaces instead of hosing)*
- *Pollution prevention and safe alternatives*
- *Household hazardous waste collection*
- *Recycling*
- *BMPs: Site specific, structural and source control*
- *BMP maintenance*
- *Non-storm water disposal alternatives (e.g., all wash waters)*
- *Pet and animal waste disposal*
- *Proper solid waste disposal (e.g., garbage, tires, appliances, furniture, vehicles)*

- *Equipment and vehicle maintenance and repair*
- *Public reporting mechanisms*
- *Green waste disposal*
- *Integrated pest management*
- *Native vegetation*
- *Proper disposal of boat and recreational vehicle waste*
- *Traffic reduction, alternative fuel use*
- *Water conservation*

F.4.b. Municipal, Construction, Industrial, Commercial, and Quasi-Governmental (educational institutions, water districts, sanitation districts) Communities

In addition to the topics listed in F.4.a. above, the Municipal, Construction, Industrial, Commercial, and Quasi-Governmental (Educational Institutions, Water Districts, Sanitation Districts) Communities shall also be educated on the following topics where applicable:

- *Basic urban runoff training for all personnel*
- *Additional urban runoff training for appropriate personnel*
- *Illicit Discharge Detection and Elimination observations and follow-up during daily work activities*
- *Lawful disposal of catchbasin and other MS4 cleanout wastes*
- *Water quality awareness for Emergency/First Responders*
- *California's Statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction).*
- *California's Statewide General NPDES Permit for Storm Water Discharges Associated with Construction Activities*
- *SDRWQCB's General NPDES Permit for Groundwater Dewatering*
- *401 Water Quality Certification by the SDRWQCB*
- *Statewide General NPDES Utility Vault Permit (NPDES No. CAG990002)*
- *SDRWQCB Waste Discharge Requirements for Dredging Activities*
- *Local requirements beyond statewide general permits*
- *Federal, state and local water quality regulations that affect development projects*
- *Water quality impacts associated with land development*
- *Alternative materials & designs to maintain peak runoff values*
- *How to conduct a storm water inspection*
- *Potable water discharges to the MS4*
- *Dechlorination techniques*
- *Hydrostatic testing*
- *Spill response, containment, & recovery*
- *Preventive maintenance*
- *How to do your job and protect water quality*

F.4.c. Residential, General Public, School Children Communities

In addition to the topics listed in F.4.a. above, the Residential, General Public, and School Children Communities shall be educated on the following topics where applicable:

- *Public reporting information resources*
- *Residential and charity car-washing*
- *Community activities (e.g., "Adopt a Storm Drain, Watershed, or Highway" Programs, citizen monitoring, creek/beach cleanups, environmental protection organization activities, etc.)*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the proposed management program include "A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Discussion: As discussed in Finding 23, implementation of an Education Component is a critical best management practice and an important aspect of the Jurisdictional URMP. The SWRCB Technical Advisory Committee "recognizes that education with an emphasis on pollution prevention is the fundamental basis for solving nonpoint source pollution problems." The US EPA finds that "An informed and knowledgeable community is critical to the success of a storm water management program since it helps ensure the following:

> Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important. […]
>
> Greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters" (2000).

Regarding target audiences, US EPA states "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children" (2000). The target communities included in Education item 7 are based on recommendations of the TAC, which states:

"Target Audiences should include:

1. Government: Educate government agencies and officials to achieve better communication, consistency, collaboration, and coordination at the federal, state and local levels.
2. K-12/Youth Groups: Establish statewide education programs, including curricula, on watershed awareness and nonpoint source pollution problems and solutions, based on a state lead role building upon and coordinating with existing local programs.
3. Development Community: Educate the development community, including developers, contractors, architects, and local government planners, engineers, and inspectors, on nonpoint source pollution problems associated with development and redevelopment and construction activities and involve them in problem definitions and solutions.
4. Business and Industrial Groups."

The required topics to be covered in the Education Component are based on topics of concern as discussed by the US EPA (1992) and the SWRCB Technical Advisory Committee. Additional education topics were also added based on the number of complaints received by the SDRWQCB and the Copermittees for various topics of concern.

US EPA identifies measurable goals for urban runoff education programs, including such goals as creation of a website, halting dumping of grease and other pollutants into the storm drain by a certain percentage of restaurants, and detecting a percent reduction in litter or animal waste in discharges (2000).

The SDRWQCB has the discretion to require item F.4 of the Jurisdictional URMP in Order No. 2001-01 under the broad and specific legal authority cited above.

F.5. ILLICIT DISCHARGE DETECTION AND ELIMINATION COMPONENT

In addition to the underlying broad legal authority citations listed above in section VII. of this Fact Sheet/Technical Report, the following specific legal authority items also generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge and Detection Elimination Component of Order No. 2001-01. Other specific legal authority items applicable only to distinct directives of Jurisdictional Urban Runoff Management Program item F.5. are provided as necessary.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) provides that the proposed management program "shall be based on a description of a program, including a schedule, to detect and remove (or require the

discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittee include in its proposed management program "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system." This regulation excludes prohibition of those non-storm water discharges listed in Section B.1 of Order 2001-01.

F.5. Illicit Discharge Detection and Elimination Component of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement an Illicit Discharge Detection and Elimination Component containing measures to actively seek and eliminate illicit discharges and connections. At a minimum the Illicit Discharge Detection and Elimination Component shall address:

F.5.a	*Illicit Discharges and Connections*
F.5.b	*Dry Weather Analytical Monitoring*
F.5.c	*Investigation / Inspection and follow-up*
F.5.d	*Elimination of Illicit Discharges and Connections*
F.5.e	*Enforce Ordinance*
F.5.f	*Prevent and Respond To Sewage Spills (Including from Private Laterals) and Other Spills*
F.5.g	*Facilitate Public Reporting of Illicit Discharges and Connections – Public Hotline*
F.5.h	*Facilitate Disposal of Used Oil and Toxic Materials*
F.5.i	*Limit Infiltration From Sanitary Sewer to MS4*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Discussion: Illicit discharges and connections can constitute a significant portion of urban runoff discharges from MS4s. US EPA states "A study conducted in 1987 in Sacramento, California, found that almost one-half of the water discharged from a local MS4 was not directly attributable to precipitation runoff. A significant portion of these dry weather flows were from illicit and/or inappropriate discharges and connections to the MS4" (2000).

MS4 discharges attributable to illicit discharges and connections can be a significant source of pollutant loading to receiving waters. The NURP study concluded that the quality of urban runoff can be adversely impacted by illicit discharges and connections (US EPA, 1983). Furthermore, US EPA states that illicit discharges and connections result in "untreated discharges that

contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic wildlife and human health" (2000).

For these reasons, CWA section 402(p)(3)(B)(ii) requires each Copermittee to prohibit non-storm water discharges into its MS4. The detection and elimination of illicit discharges and connections is also clearly identified in the federal regulations as a high priority (40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1)). As guidance for detecting and eliminating illicit discharges and connections, the US EPA suggests "The proposed management program must include a description of inspection procedures, orders, ordinances, and other legal authorities necessary to prevent illicit discharges to the MS4" (1992).

The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Management Program item F.5 in Order 2001-01 under the broad legal authority cited above.

F.5.a. Illicit Discharges and Connections of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement a program to actively seek and eliminate illicit discharges and connections into its MS4. The program shall address all types of illicit discharges and connections excluding those non-storm water discharges not prohibited by the Copermittee in accordance with Section B. of this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Discussion: See discussion for F.5 Illicit Discharge Detection and Elimination Component above.

F.5.b. Dry Weather Analytical Monitoring of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall conduct dry weather analytical monitoring of MS4 outfalls within its jurisdiction to detect illicit discharges and connections in accordance with Attachment E of this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) provides that the Copermittee include in its proposed management program "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Discussion: Since illicit discharges and connections can be significant sources of pollutants in urban runoff, and can cause receiving water degradation, the locations of all illicit discharges and connections need to be identified. An effective means for achieving this is analytical monitoring of dry weather urban runoff flows. By analytically monitoring dry weather urban runoff, results of the analytical monitoring can be used to identify locations potentially impacted by illicit discharges or connections. If results indicate that an illicit discharge or connection may be present, then follow-up procedures can be followed to pinpoint the source of the illicit discharge or connection. Once the illicit discharge or connection source is identified, steps may be taken to eliminate the discharge or connection. In this manner, dry weather analytical monitoring of urban runoff can lead to the elimination of illicit discharges and connections and the reduction of pollutants in urban runoff. The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Management Program item F.5.b in Order No. 2001-01 under the broad and specific legal authority cited above.

F.5.c. Investigation/Inspection and Follow-up of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall investigate and inspect any portion of the MS4 that, based on dry weather analytical monitoring results or other appropriate information, indicates a reasonable potential of illegal discharges, illicit connections, or other sources of non-storm water (including non-prohibited discharge(s) identified in Section B. of this Order). Each Copermittee shall establish criteria to identify portions of the system where such follow-up investigations are appropriate.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all

directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) provides that the Copermittee include in its proposed management program "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Discussion: The quality of urban runoff can be adversely impacted by illicit discharges and connections (US EPA, 1983). Elimination of these sources of pollutants can therefore result in a dramatic improvement in the quality of urban runoff discharges from MS4s, which in turn can result in improved receiving water quality. If field screening results indicate the presence of illicit discharges to the MS4, that portion of the MS4 must be investigated to eliminate the illicit discharge and prevent further potential degradation of receiving waters. To determine when follow-up procedures should be undertaken, US EPA states "Applicants should propose criteria to identify portions of the system where follow-up investigations are appropriate" (1992).

Procedures to investigate priority locations for illicit connections include sampling for such constituents as fecal coliform, fecal streptococcus, surfactants (MBAS), residual chlorine, flourides and potassium, inspection of the storm sewer system, use of remote-control cameras, on-site inspections and dye testing at priority or suspect facilities, and additional discharge monitoring to pinpoint pollutant sources.

The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Management Program item F.5.c in Order No. 2001-01 under the broad and specific legal authority cited above.

F.5.d. Elimination of Illicit Discharges and Connections of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall eliminate all detected illicit discharges, discharge sources, and connections immediately.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Water Quality Control Plan for the San Diego Basin Waste Discharge Prohibition 8 states "Any discharge to a storm water conveyance system that is not entirely composed of 'storm water' is prohibited unless authorized by the Regional Board." California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the SDRWQCB implement the Basin Plan.

Discussion: Under CWA section 402(p)(3)(B)(ii) and Water Quality Control Plan for the San Diego Basin Waste Discharge Prohibition 8 non-storm water discharges are prohibited. By definition, illicit discharges and connections are non-storm water discharges. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) also requires illicit discharges and connections to be detected and removed. Therefore, any detected illicit discharges or connections must be eliminated. US EPA supports elimination of detected illicit discharges and connections when it states "Once the source is identified, the offending discharger should be notified and directed to correct the problem. Education efforts and working with the discharger can be effective in resolving the problem before taking legal action." The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.5.d in Order No. 2001-01 under the broad and specific legal authority cited above.

F.5.e. Enforce Ordinances of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement and enforce its ordinances, orders, or other legal authority to prevent illicit discharges and connections to its MS4. Each Copermittee shall also implement and enforce its ordinance, orders, or other legal authority to eliminate detected illicit discharges and connections to it MS4.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Discussion: To prevent and eliminate illicit discharges and connections, the Copermittee must implement and enforce its ordinance, orders, or other legal authority over illicit discharges and connections. The US EPA states that this "proposed management program component should describe how the prohibition on illicit discharges will be implemented and enforced. The description could include a schedule and allocation of staff and resources. A direct linkage should exist between this program component and the adequate legal authority requirements for the ordinances and orders to

effectively implement the prohibition of illicit discharges" (1992). The SDRWQCB has the discretion to require Jurisdictional Urban Runoff Management Program item F.5.e in Order 2001-01 under the broad legal authority cited above.

F.5.f. Prevent and Respond to Sewage and Other Spills of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall prevent, respond to, contain and clean up all sewage and other spills that may discharge into its MS4 from any source (including private laterals). Spill response teams shall prevent entry of spills into the MS4 and contamination of surface water, ground water and soil to the maximum extent practicable. Each Copermittee shall coordinate spill prevention, containment and response activities throughout all appropriate departments, programs and agencies to ensure maximum water quality protection at all times.

Each Copermittee shall develop and implement a mechanism whereby it is notified of all sewage spills from private laterals into its MS4. Each Copermittee shall prevent, respond to, contain and clean up sewage from any such notification.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) provides that the Copermittee include in its proposed management program "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

Discussion: Sewage and other spills frequently enter the MS4, to be carried and discharged to receiving waters. Such spills into and from the MS4 can severely impair receiving water quality and pose a significant threat to public health. To avoid these negative impacts, the proposed management program must describe procedures that the Copermittee will implement to prevent, contain, and respond to spills that may discharge into the MS4. The US EPA states "The goal of a spill prevention program is to reduce the frequency and extent of spills of hazardous materials which can cause water quality impairment. Spill containment programs may establish minimum chemical storage and handling requirements, require users to submit prevention and control plans, and ensure site inspections. […] Spill response teams should attempt to prevent or minimize contamination of surface water, groundwater, and soil. Spill response programs often require a coordinated response from a number of municipal departments. Municipalities should describe how response procedures within these programs attempt to mitigate potential pollutant discharges to surface waters and the MS4"

(1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.5.f in Order No. 2001-01 under the broad and specific legal authority cited above.

F.5.g. Facilitate Public Reporting of Illicit Discharges and Connections – Public Hotline of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall promote, publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s. Each Copermittee shall facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by Copermittees. All storm water hotlines shall be capable of receiving reports in both English and Spanish 24 hours per day/ seven days per week. Copermittees shall respond to and resolve each reported incident. All reported incidents, and how each was resolved, shall be summarized in each Copermittee's individual Jurisdictional URMP Annual Report.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) provides that the Copermittee include in its proposed management program "a description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers."

Discussion: Regarding public reporting of illicit discharges or water quality impacts associated with discharges from MS4s, the US EPA states "Timely reporting by the public of improper disposal and illicit discharges are critical components of programs to control such sources. To enhance public awareness, programs may include setting up a public information hotline number, educating school students, community and volunteer watchdog groups, using inserts into utility bills, and newspaper, radio, and television announcements to inform the public about what to look for and how to report incidents" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.5.g in Order No. 2001-01 under the broad and specific legal authority cited above.

F.5.h. Facilitate Disposal of Used Oil and Toxic Materials of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall facilitate the proper management and disposal of used oil, toxic materials, and other household hazardous wastes. Such facilitation shall include educational*

activities, public information activities, and establishment of collection sites operated by the Copermittee or a private entity. Curbside collection of household hazardous wastes is encouraged.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the Copermittee include in its proposed management program "a description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Discussion: The US EPA states "If private individuals find the proper disposal of used oil or toxic materials difficult, incidents of improper disposal (such as into the MS4) increase" (1992). Therefore Copermittees are required to propose a program component that will facilitate the proper disposal of used oil and toxics from households by establishing municipally operated collection sites, or ensuring that privately operated collections sites are available. The US EPA suggests this program component "should describe outreach plans to handlers of used oil and to the public, and operating plans for oil and household waste collection programs" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.5.h in Order No. 2001-01 under the broad and specific legal authority cited above.

F.5.i. Limit Infiltration from Sanitary Sewer to MS4 of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall implement controls and measures to limit infiltration of seepage from municipal sanitary sewers to MS4s. Such controls shall include overall sanitary sewer and MS4 system surveys and thorough, routine preventive maintenance of both.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) and 40 CFR 122.26(d)(2)(iv)(B)(1) generally apply to all directives under Jurisdictional Urban Runoff Management Program item F.5. Illicit Discharge Detection and Elimination Component of Order No. 2001-01.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) provides that the Copermittee include in its proposed management program "a description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary."

Discussion: Regarding seepage from sanitary sewers, the US EPA states "Raw sewage can seep from sanitary sewage collection systems through leaks and cracks in aging pipes, poorly constructed manholes and joints, and main breaks. Sewage from a leaky sanitary system can flow to storm sewers or contaminate ground water supplies. Interaction between sanitary sewers and separate storm sewers may occur at manholes and where sanitary sewer laterals and storm sewer trenches cross. Separate storm sewers and sanitary sewers may share the same trench, which is generally filled with very porous material such as gravel" (1992). When raw sewage enters the storm water system, it can reach receiving waters untreated, posing a threat to water quality and public health. In order to prevent this condition, the SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.5.i in Order No. 2001-01 under the broad and specific legal authority cited above.

F.6. PUBLIC PARTICIPATION COMPONENT

F.6. Public Participation Component of the Jurisdictional Urban Runoff Management Program states the following:

Each Copermittee shall incorporate a mechanism for public participation in the implementation of the Jurisdictional URMP.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Discussion: Public participation can be an important tool for strengthening an urban runoff management program. US EPA strongly supports public participation when it states "An active and involved community is crucial to the success of a storm water management program because it allows for:

Broader public support since citizens who participate in the development and decision making process are partially responsible for the program and, therefore, may be less likely to raise legal challenges to the program and more likely to take an active role in its implementation;

Shorter implementation schedules due to fewer obstacles in the form of public and legal challenges and increased sources in the form of citizen volunteers;

A broader base of expertise and economic benefits since the community can be a valuable, and free, intellectual resource; and

A conduit to other programs as citizens involved in the storm water program development process provide important cross-connections and relationships with other community and government programs. This benefit is particularly valuable when trying to implement a storm water program on a watershed basis, as encouraged by EPA" (2000).

The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management Program item F.6 in Order No. 2001-01 under the broad legal authority cited above.

F.7. ASSESSMENT OF JURISDICTIONAL URMP EFFECTIVENESS COMPONENT

F.7. Assessment of Jurisdictional URMP Effectiveness Component of the Jurisdictional Urban Runoff Management Program states the following:

a. *As part of its individual Jurisdictional URMP, each Copermittee shall develop a long-term strategy for assessing the effectiveness of its individual Jurisdictional URMP. The long-term assessment strategy shall identify specific direct and indirect measurements that each Copermittee will use to track the long-term progress of its individual Jurisdictional URMP towards achieving improvements in receiving water quality. Methods used for assessing effectiveness shall include for example surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.*

b. *As part of its individual Jurisdictional URMP Annual Report, each Copermittee shall include an assessment of the effectiveness of its Jurisdictional URMP using the direct and indirect assessment measurements and methods developed in its long-term assessment strategy.*

c. *Individual Jurisdictional URMP Annual Reports shall also include each Copermittees' self-assessment of its "status of compliance" with this Order. Specifically, each Annual Report shall specify its self-assessment of its "percent compliance with each component of its Jurisdictional URMP" (sections F.1.-F.8.), as well as the Copermittees' self-assessment of its "overall percent compliance" with this Order in its entirety.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(v) provides that the Copermittees must include "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water." Under Federal NPDES regulation 40 CFR 122.42(c) applicants must provide annual reports on the progress of their storm water management programs.

Discussion: Regarding the assessment of the effectiveness of URMPs, the US EPA states that "At a minimum, applicants must submit estimated reductions in pollutant loads expected to result from implemented controls and describe known impacts of storm water controls on groundwater" (1992). The US EPA suggests that the assessments include direct and indirect measurements of effectiveness, stating that "Reductions in pollutant loads due to the implementation and maintenance of structural controls provide direct measurements of the effectiveness of the storm water management program. In addition, EPA encourages applicants to go beyond the minimum requirement and assess the effectiveness of their storm water management program through other direct measurements as well as indirect measurements" (1992). The US EPA also recommends that monitoring data be used to substantiate or refine the assessment, suggesting that "the estimated removal efficiencies can be refined through the monitoring program. […] Throughout the permit term, the municipality must submit refinements to its assessment or additional direct measurements of program effectiveness in its annual report" (1992). Finally, the US EPA suggests that the assessment be used for long-term assessment of progress when it states "The applicant should use direct measurements of program effectiveness as it begins to assess its long-term progress in improving water quality through storm water management practices. […] [A]pplicants are encouraged to use direct measurements of program effectiveness, such as annual pollutant loads, event mean concentrations, and seasonal pollutant loadings, to begin to estimate long-term trends" (1992). The SDRWQCB has discretion to require Jurisdiction Urban Runoff Management Program item F.7 in Order No. 2001-01 under the broad and specific legal authority cited above.

F.8. FISCAL ANALYSIS COMPONENT

F.8. Fiscal Analysis Component of the Jurisdictional Urban Runoff Management Program states the following:

> *Each Copermittee shall secure the resources necessary to meet the requirements of this Order. As part of its individual Jurisdictional URMP, each Copermittee shall develop a strategy to conduct a fiscal analysis of its urban runoff management program in its entirety. In order to demonstrate sufficient financial resources to implement the conditions of this Order, each Copermittee shall conduct an annual fiscal analysis as part of its individual Jurisdictional URMP Annual Report. This analysis shall, for each fiscal year covered by this Order, evaluate the expenditures (such as capital, operation and maintenance, education, and administrative expenditures) necessary to accomplish the activities of the Copermittee's urban runoff management program. Such analysis shall include a description of the source(s) of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(vi) provides that "[The Copermittee must submit] for each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2)(iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds."

Discussion: A fiscal analysis can be an important planning tool. The US EPA finds that "examining the levels of proposed spending and funding allows the permitting authority to gauge the ability of the applicant to implement the program and predict its effectiveness. The fiscal analysis also will help the [SDRWQCB] determine whether the applicant has met the statutory requirement of reducing the discharge of pollutants to the MS4 to the maximum extent practicable. Finally, the estimates help the applicant evaluate the feasibility and cost-effectiveness of its program" (1992). The SDRWQCB has discretion to require Jurisdictional Urban Runoff Management item F.8 in Order No. 2001-01 under the broad and specific legal authority cited above.

G. IMPLEMENTATION OF JURISDICTIONAL URMP

G. Implementation of Jurisdictional URMP states the following:

*Each Copermittee shall have completed full implementation of all requirements of the Jurisdictional URMP section of this Order no later than **180 days after adoption** of this Order, with the exception of the requirements included in the Land-Use Planning for New Development and Redevelopment Component of the Jurisdictional URMP section of this Order. Each Copermittee shall have completed full implementation of all requirements of the Land-Use Planning for New Development and Redevelopment Component of the Jurisdictional URMP section of this Order no later **than 365 days after adoption** of this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Discussion: The requirements of the NPDES regulations for urban runoff have been in place for many years. Falling under these regulations, the Copermittees should currently be implementing adequate urban runoff programs to be in compliance with the regulations. The requirements in Order No. 2001-01 are based on the NPDES regulations; therefore, the vast majority of the requirements in Order No. 2001-01 should already be implemented by the Copermittees. For this reason, implementation schedules of 180 days and 365 days should be more than adequate to meet the requirements of Order No. 2001-01. The SDRWQCB has discretion to require Implementation of Jurisdictional URMP item G. in Order No. 2001-01 under the broad legal authority cited above.

H. SUBMITTAL OF JURISDICTIONAL URMP DOCUMENT

H. Submittal of Jurisdictional URMP Document states the following:

The written account of the overall program to be conducted by each Copermittee within its jurisdiction during the five-year life of this Order is referred to as the "Jurisdictional URMP Document".

1. *Individual – Each Copermittee shall submit to the Principal Permittee an individual Jurisdictional URMP document which describes all activities it is undertaking to implement the requirements of each component of the Jurisdictional URMP section F. of this Order. Individual Jurisdictional URMP documents shall be submitted in two parts.*

    a. *The first submittal of the individual Jurisdictional URMP document shall address the requirements of the entire Jurisdictional URMP section of this Order, with the exception of the Land-Use Planning for New Development and Redevelopment Component (i.e., sections F.2. – F.8.) At a minimum, the first submittal of the individual Jurisdictional URMP document shall contain the following information for the following components:*

        (1) Construction Component

            (a) Which pollution prevention methods will be required for implementation and how they will be required
            (b) Updated grading ordinances
            (c) A description of the modified construction and grading approval process
            (d) Updated conditions of approval in local grading and construction permits
            (e) A completed watershed based inventory of all construction sites
            (f) A completed prioritization of all construction sites based on threat to water quality
            (g) Which BMPs will be implemented, or required to be implemented, for each priority category
            (h) How BMPs will be implemented, or required to be implemented, for each priority category
            (i) Planned inspection frequencies for each priority category
            (j) Methods for inspection
            (k) A description of enforcement mechanisms and how they will be used
            (l) A description of how non-compliant sites will be identified and the process for notifying the SDRWQCB, including a list of current non-compliant sites
            (m) A description of the construction education program and how it will be implemented

        (2) Municipal (Existing Development) Component

            (a) Which pollution prevention methods will be required for implementation and how they will be required
            (b) A completed watershed based inventory of all municipal land use areas and activities
            (c) A completed prioritization of all municipal areas and activities based on threat to water quality
            (d) Which BMPs will be implemented, or required to be implemented, for each priority category
            (e) How BMPs will be implemented, or required to be implemented, for each priority category
            (f) Municipal maintenance activities and schedules

(g) Planned inspection frequencies for the high priority category
(h) Methods for inspection
(i) A description of enforcement mechanisms and how they will be used

(3) Industrial (Existing Development) Component

(a) Which pollution prevention methods will be required for implementation and how they will be required
(b) A completed watershed based inventory of all industrial sites
(c) A completed prioritization of all industrial sites based on threat to water quality
(d) Which BMPs will be implemented, or required to be implemented, for each priority category
(e) How BMPs will be implemented, or required to be implemented, for each priority category
(f) A description of the monitoring program to be conducted, or required to be conducted
(g) Planned inspection frequencies for each priority category
(h) Methods for inspection
(i) A description of enforcement mechanisms and how they will be used
(j) A description of how non-compliant sites will be identified and the process for notifying the SDRWQCB, including a list of current non-compliant sites

(4) Commercial (Existing Development) Component

(a) Which pollution prevention methods will be required for implementation and how they will be required
(b) A completed watershed based inventory of high priority commercial sites
(c) Which BMPs will be implemented, or required to be implemented, for high priority sites
(d) How BMPs will be implemented, or required to be implemented, for high priority sites
(e) Planned inspection frequencies for high priority sites
(f) Methods for inspection
(g) A description of enforcement mechanisms and how they will be used

(5) Residential (Existing Development) Component

(a) Which pollution prevention methods will be encouraged for implementation and how they will be encouraged
(b) A completed inventory of high priority residential areas and activities
(c) Which BMPs will be implemented, or required to be implemented, for high priority areas and activities
(d) How BMPs will be implemented, or required to be implemented, for high priority areas and activities
(e) A description of enforcement mechanisms and how they will be used

(6) Education Component

(a) A description of the content, form, and frequency of education efforts for each target community

(7) Illicit Discharges Detection and Elimination Component

(a) A description of the program to actively seek and eliminate illicit discharges and connections
(b) A description of dry weather analytical monitoring to be conducted to detect illicit discharges and connections (see Attachment E)

(c) A description of investigation and inspection procedures to follow-up on dry weather analytical monitoring results or other information which indicate potential for illicit discharges and connections
(d) A description of procedures to eliminate detected illicit discharges and connections
(e) A description of enforcement mechanisms and how will they be used
(f) A description of methods to prevent, respond to, contain, and clean up all sewage (including spills from private laterals) and other spills in order to prevent entrance into the MS4
(g) A description of the mechanism to receive notification of spills from private laterals
(h) A description of efforts to facilitate public reporting of illicit discharges and connections, including a public hotline
(i) A description of efforts to facilitate proper disposal of used oil and other toxic materials
(j) A description of controls and measures to be implemented to limit infiltration of seepage from sanitary sewers to MS4s
(k) A description of routine preventive maintenance activities on the sanitary system and MS4

(8) Public Participation Component

(a) A description of how public participation will be included in the implementation of the Jurisdictional URMP

(9) Assessment of Jurisdictional URMP Effectiveness Component

(a) A description of strategies to be used for assessing the long-term effectiveness of the individual Jurisdictional URMP.

(10) Fiscal Analysis Component

(a) A description of the strategy to be used to conduct a fiscal analysis of the urban runoff management program.

b. The second submittal of the individual Jurisdictional URMP document shall address the requirements of the Land-Use Planning for New Development and Redevelopment Component of the Jurisdictional URMP section F.1. of this Order. At a minimum, the second submittal of the individual Jurisdictional URMP document shall contain the following information for the following components:

(1) General Plan or equivalent plan revisions, specifying water protection policies
(2) Conditions of project approval in local development permits
(3) Participation efforts conducted in the development of the Model SUSMP
(4) Environmental review processes and CEQA initial study checklist revisions
(5) A description of the planning education program and how it will be implemented

c. Each Copermittee shall submit to the Principal Permittee each part of its individual Jurisdictional URMP document by the dates specified by the Principal Permittee.

d. In addition to submittal of the two parts of the Jurisdictional URMP document, each Copermittee shall submit to the SDRWQCB its own adopted local SUSMP consistent with the approved Model SUSMP, as described in section F.1.b.(2). of this Order. Each Copermittee's own local SUSMP, along with its amended ordinances, shall be submitted to the SDRWQCB within 180 days of the SDRWQCB's approval of the Model SUSMP.

2. *Unified – The Principal Permittee shall submit the unified Jurisdictional URMP document to the SDRWQCB. The unified Jurisdictional URMP document shall be submitted in two parts.*

   a. *The first unified Jurisdictional URMP document submittal shall address the requirements of the entire Jurisdictional URMP sections F.2 – F.8. of this Order, with the exception of the Land-Use Planning for New Development and Redevelopment Component. The first unified Jurisdictional URMP document submittal shall contain a section covering common activities conducted collectively by the Copermittees, to be written by the Principal Permittee, and the twenty individual Jurisdictional URMP documents. The Principal Permittee shall submit the first unified Jurisdictional URMP document to the SDRWQCB within **180 days of adoption** of this Order.*

   b. *The second unified Jurisdictional URMP document submittal shall address the requirements of the Land-Use Planning for New Development and Redevelopment Component of the Jurisdictional URMP section of this Order. The second unified Jurisdictional URMP document submittal shall contain a section covering common activities conducted collectively by the Copermittees, to be written by the Principal Permittee, and the twenty individual Jurisdictional URMP documents. As part of the second unified Jurisdictional URMP document, the Principal Permittee shall be responsible for the development and writing of a stand alone Model SUSMP document meeting the requirements of section F.1.b.(2). of this Order. The Principal Permittee shall submit the second unified Jurisdictional URMP document, including the Model SUSMP, to the SDRWQCB within **365 days of adoption** of this Order.*

3. *Universal Reporting Requirements*

   All individual and unified Jurisdictional URMP document submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code section 13267 provides that "the regional board may require than any person who has discharged [...] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Discussion: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv) require each Copermittee to develop and implement an urban runoff management program. The SDRWQCB must assess the urban runoff management program to ensure that it is adequate to prohibit non-storm water discharges and reduce pollutant discharges to and from the MS4 to the maximum extent practicable. In order for the SDRWQCB to assess the urban runoff management program, each Copermittee must submit to the SDRWQCB a description of their program. The description must detail all activities the Copermitee is undertaking to implement the requirements of each component of the Jurisdictional URMP section of Order No. 2001-01.

The submittal schedule of 180 and 365 days for Jurisdictional URMP documents is designed to provide each Copermittee some time to develop its Jurisdictional URMP. However, this time is limited since the Jurisdictional URMP requirements are based on NPDES regulations which have been in place for many years. The vast majority of the requirements in the Jurisdictional URMP should already be implemented by each Copermittee. Therefore, the provided submittal schedule should be more than adequate for each Copermittee to rework its Jurisdictional URMP to meet the Jurisdictional URMP requirements of Order No. 2001-01.

Compilation of the individual Jurisdictional URMP documents into a unified Jurisdictional URMP document by the Principal Permittee will ease the effort needed to assess and digest the information contained in the documents. The Principal Permittee's provision of a summary covering common activities conducted collectively by the Copermittees will provide a useful overview of urban runoff management efforts within the County of San Diego. This type of compilation of the Copermittees' documents has been recommended by the Copermittees in the past.

The SDRWQCB has discretion to require Submittal of Jurisdictional URMP Document item H. in Order No. 2001-01 under the broad and specific legal authority cited above.

I. SUBMITTAL OF JURISDICTIONAL URMP ANNUAL REPORT

I. Submittal of Jurisdictional URMP Annual Report states the following:

1. *Individual - Each individual Jurisdictional URMP Annual Report shall be a documentation of the activities conducted by each Copermittee during the past annual reporting period. Each Jurisdictional URMP Annual Report shall, at a minimum, contain the following:*

    a. *Comprehensive description of all activities conducted by the Copermittee to meet all requirements of each component of the Jurisdictional URMP section of this Order;*
        - *F.1. Land-Use Planning for New Development and Redevelopment Component*
        - *F.2. Construction Component*
        - *F.3. Existing Development Component (Including Municipal, Industrial, Commercial, Residential, and Education)*
        - *F.4. Education Component*
        - *F.5. Illicit Discharge Detection and Elimination Component*
        - *F.6. Public Participation Component*
        - *F.7. Assessment of Jurisdictional URMP Effectiveness Component*
        - *F.8. Fiscal Analysis Component*

    b. *Each Copermittee's accounting of all:*
        - *(1) Reports of illicit discharges and how each was resolved (indicating referral source);*
        - *(2) Inspections conducted;*
        - *(3) Enforcement actions taken; and*
        - *(4) Education efforts.*

c. Public participation mechanisms utilized during the Jurisdictional URMP implementation process;

d. Proposed revisions to the Jurisdictional URMP;

e. A summary of all urban runoff related data not included in the annual monitoring report (e.g., special investigations);

f. Annual expenditures from previous year and budget for upcoming year;

g. Identification of management measures proven to be effective in reducing urban runoff pollutants and flow;

h. Identification of management measures proven to be ineffective in reducing urban runoff pollutants and flow;

i. Identification of water quality improvements or degradation; and

j. Self-assessment of Copermittees' "percent compliance with each component of its Jurisdictional URMP" and "overall percent compliance with this Order" in its entirety.

2. Unified - The unified Jurisdictional URMP Annual Report shall contain a section covering common activities conducted collectively by the Copermittees, to be written by the Principal Permittee, and the twenty individual Jurisdictional URMP Annual Reports. Each Copermittee shall submit to the Principal Permittee an individual Jurisdictional URMP Annual Report by the date specified by the Principal Permittee. The Principal Permittee shall submit a unified Jurisdictional URMP to the SDRWQCB by ***January 31, 2002 and every January 31 thereafter****. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2002 shall cover the reporting period July 1, 2000 to June 30, 2001.*

3. Universal Reporting Requirements

All individual and unified Jurisdictional URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout

the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

Discussion: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv) require each Copermittee to develop and implement an urban runoff management program. The SDRWQCB must assess the urban runoff management program to ensure that it is adequate to prohibit non-storm water discharges and reduce pollutant discharges to and from the MS4 to the maximum extent practicable. In order for the SDRWQCB to assess the urban runoff management program, each Copermittee must submit to the SDRWQCB an annual report describing all of the activities it undertook to meet the requirements of the Jurisdictional URMP section of Order No. 2001-01.

The Jurisdictional URMP Annual Reports can also be useful tools for the Copermittees. They provide a focus to review, update, or revise the URMPs on an annual basis. Successful and unsuccessful measures can be identified, helping to focus efforts on areas or issues which provide the greatest results. Areas or issues which have received insufficient efforts can also be identified and improved.

The SDRWQCB has the discretion to require Submittal of Jurisdictional URMP Annual Report item I. in Order No. 2001-01 under the broad and specific legal authority cited above.

J. WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM

J.1. Watershed Urban Runoff Management Program states the following:

Each Copermittee shall collaborate with other Copermittees within its watershed(s) as shown in Table 4. below to identify and mitigate the highest priority water quality issues/pollutants in the watershed(s).

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Discussion: Urban runoff does not follow municipality boundaries, and often travels through many municipalities while flowing towards receiving waters. The actions of various municipalities within a watershed regarding urban runoff can therefore have a cumulative impact upon shared receiving waters. Due to the interrelated nature of urban runoff management, Copermittee collaboration is necessary to minimize shared receiving water quality degradation (see Finding 31). Copermittee collaboration of this type focuses water quality protection on watersheds, which is effective because it "more clearly identif[ies] critical areas and practices which need to be targeted for pollution prevention and corrective actions" (SDRWQCB, 1994).

The highest priority water quality issues/pollutants in each watershed can be identified and addressed, providing the greatest water quality improvements for the amount of effort. The SWRCB Urban Runoff Technical Advisory Committee recommends Copermittee collaboration for watershed based water quality protection, stating "Municipal permits should have watershed specific components." The SDRWQCB has discretion to require Watershed Urban Runoff Management Program item J.1. in Order No. 2001-01 under the broad legal authority cited above.

J.2. Watershed Urban Runoff Management Program states the following:

Each Copermittee shall collaborate with all other Copermittees discharging urban runoff into the same watershed to develop and implement a Watershed Urban Runoff Management Program (Watershed URMP) for the respective watershed. Each Watershed URMP shall, at a minimum contain the following:

a. *An accurate map of the watershed (preferably in Geographical Information System [GIS] format) that identifies all receiving waters (including the Pacific Ocean); all Clean Water Act section 303(d) impaired receiving waters (including the Pacific Ocean); land uses; MS4s, major highways; jurisdictional boundaries; and inventoried commercial, construction, industrial, municipal sites, and residential areas.*

b. *An assessment of the water quality of all receiving waters in the watershed based upon (1) existing water quality data; and (2) annual watershed water quality monitoring that satisfies the watershed monitoring requirements of Attachment B;*

c. *An identification and prioritization of major water quality problems in the watershed caused or contributed to by MS4 discharges and the likely source(s) of the problem(s);*

d. *An implementation time schedule of short and long-term recommended activities (individual and collective) needed to address the highest priority water quality problem(s). For this section, "short-term activities" shall mean those activities that are to be completed during the life of this Order and "long-term activities" shall mean those activities that are to be completed beyond the life of this Order;*

e. *An identification of the Copermittee(s) responsible for implementing each recommended activity, including time schedule for implementation;*

f. *A mechanism for public participation throughout the entire watershed URMP process;*

g. *A watershed based education program;*

h. *A mechanism to facilitate collaborative "watershed-based" (i.e., natural resource-based) land use planning with neighboring local governments in the watershed;*

i. *An implementation schedule for collaborative watershed-based land use planning to begin no later than January 2005.*

j. *A long-term strategy for assessing the effectiveness of the Watershed URMP. The long-term assessment strategy shall identify specific direct and indirect measurements that will track the long-term progress of Watershed URMP towards achieving improvements in receiving water quality. Methods used for assessing effectiveness shall include for example: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in*

substantiating or refining the assessment.

Table 4. Copermittees by Watershed

RESPONSIBLE COPERMITTEE(S)	*WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM*	*HYDROLOGIC UNIT OR AREA*	*MAJOR RECEIVING WATER BODIES*
1. County of San Diego	*Santa Margarita River*	*Santa Margarita HU (902.00)*	*Santa Margarita River and Estuary, Pacific Ocean*
1. City of Escondido ***2. City of Oceanside*** *3. City of Vista* *4. County of San Diego*	*San Luis Rey River*	*San Luis Rey HU (903.00)*	*San Luis Rey River and Estuary, Pacific Ocean*
1. City of Carlsbad ***2. City of Encinitas*** *3. City of Escondido* *4. City of Oceanside* *5. City of San Marcos* *6. City of Solana Beach* *7. City of Vista* *8. County of San Diego*	*Carlsbad*	*Carlsbad HU (904.00)*	*Batiquitos Lagoon* *San Elijo Lagoon* *Agua Hedionda Lagoon* *Buena Vista Lagoon and Tributary Streams* *Pacific Ocean*
1. City of Del Mar ***2. City of Escondido*** *3. City of Poway* *4. City of San Diego* *5. City of Solana Beach* *6. County of San Diego*	*San Dieguito River*	*San Dieguito HU (905.00)*	*San Dieguito River and Estuary* *Pacific Ocean*
1. City of Del Mar ***2. City of Poway*** *3. City of San Diego* *4. County of San Diego*	*Peñasquitos*	*Miramar Reservoir HA (906.10)* *Poway HA (906.20)*	*Los Peñasquitos Creek* *Los Peñasquitos Lagoon* *Pacific Ocean*
1. City of San Diego	*Mission Bay*	*Scripps HA (906.30)* *Miramar HA(906.40)* *Tecolote HA (906.50)*	*Mission Bay* *Pacific Ocean*
1. City of El Cajon *2. City of La Mesa* *3. City of Poway* *4. City of San Diego* *5. City of Santee* *6. County of San Diego*	*San Diego River*	*San Diego HU (907.00)*	*San Diego River* *Pacific Ocean*
1. City of Chula Vista *2. City of Coronado* *3. City of El Cajon* *4. City of Imperial Beach* *5. City of La Mesa* *6. City of Lemon Grove* *7. City of National City* *8. City of San Diego* *9. County of San Diego* ***10. San Diego Unified Port District***	*San Diego Bay*	*Pueblo San Diego HU (908.00)* *Sweetwater HU (909.00)* *Otay HU (910.00)*	*San Diego Bay* *Sweetwater River* *Otay River* *Pacific Ocean*
1. City of Imperial Beach *2. City of San Diego* *3. County of San Diego*	*Tijuana River*	*Tijuana (911.00)*	*Tijuana River and Estuary* *Pacific Ocean*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Discussion: Management of urban runoff on a watershed basis is recommended by the SWRCB and the SDRWQCB. The SWRCB Urban Runoff Technical Advisory Committee (TAC) defines watershed based water quality protection as "the prevention/control of pollution and management of human activities in a geographically or other defined drainage area to protect, restore, and/or enhance the natural resources and beneficial uses within the watershed." The TAC recommends that "All NPDES permits and Waste Discharge Requirements should be considered for reissuance on a watershed basis." The SDRWQCB also recommends watershed based water quality protection, stating in its Basin Plan that "public agencies and private organizations concerned with water resources have come to recognize that a comprehensive evaluation of pollutant contributions on a watershed scale is the only way to realistically assess cumulative impacts and formulate workable strategies to truly protect our water resources. Both water pollution and habitat degradation problems can best be solved by following a basin-wide approach." The SDRWQCB has therefore required development of Watershed URMPs by the Copermittees. The various Watershed URMPs to be developed are based on Hydrologic Units or Areas defined by the SWRCB.

Development and implementation of Watershed URMPs will provide for more effective receiving water quality protection. Watershed URMPs provide for threatened or impaired receiving waters, including their pollutants or concern, to be identified. The entire watershed for the receiving water can then be assessed, allowing for critical areas and practices to be targeted for corrective actions. Known sources of pollutants of concern can be investigated for potential water quality impacts. Problem areas can then be addressed, leading to eventual improvements in receiving water quality. Management of urban runoff on a watershed basis allows for specific water quality problems to be targeted so that efforts result in maximized water quality improvements.

Regarding watershed-based land-use planning, see the discussion of Finding 30.

The SDRWQCB has discretion to require Watershed Urban Runoff Management Program item J.2. in Order No. 2001-01 under the broad legal authority cited above.

K. IMPLEMENTATION OF WATERSHED URMP

K. Implementation of Watershed URMP states the following:

Each Copermittee shall have completed full implementation of all requirements of the Watershed URMP section of this Order no later than January 31, 2003.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Discussion: As discussed above in section J.2, the SDRWQCB finds watershed based urban runoff management to be an effective means for managing urban runoff. Watershed based urban runoff management focuses on the most pressing water quality concerns, so that management efforts result in the greatest water quality improvements. The SDWQCB is seeking to expand watershed based urban runoff management, including the potential for reissuance of municipal storm water permits on a watershed basis. In order to work towards this goal, the SDRWQCB is requiring implementation of Watershed URMPs by the Copermittees. The SWRCB Urban Runoff Technical Advisory Committee supports watershed management of urban runoff, stating "Municipal permits should have watershed specific components" and "All NPDES permits and Waste Discharge Requirements should be considered for reissuance on a watershed basis." The SDRWQCB foresees the shift to extensive watershed management of urban runoff to be gradual; it is therefore providing the Copermittees with several years before Watershed URMP implementation is required. The SDRWQCB has discretion to require Watershed Urban Runoff Management Program item K. in Order No. 2001-01 under the broad legal authority cited above.

L. SUBMITTAL OF WATERSHED URMP DOCUMENT

L. Submittal of Watershed URMP Document states the following:

The written account of the overall watershed program to be conducted by each Copermittee during the remaining life of this Order is referred to as the "Watershed URMP Document". The Watershed URMP is conducted concurrently with the Jurisdictional URMP.

1. *Watershed Specific - Each Watershed Specific URMP document shall state how the member Copermittees within each watershed will develop and implement the requirements of the Watershed URMP section J. of this Order. The Copermittees responsible for each of the nine Watershed URMPs are specified in Table 4. above. The Lead Watershed Copermittee for each watershed is highlighted. Each Lead Watershed Copermittee shall be responsible for producing its respective Watershed URMP document, as well as for coordination and meetings amongst all member watershed Copermittees. Each Lead Watershed Copermittee is further responsible for the submittal of the Watershed URMP document to the Principal Permittee by the date specified by the Principal Permittee.*

    a. *Each Watershed specific URMP document shall include:*

        (1) *A completed watershed map*
        (2) *A water quality assessment and watershed monitoring needed*
        (3) *Prioritization of water quality problems*
        (4) *Recommended activities (short and long term)*
        (5) *Individual Copermittee implementation responsibilities and time schedules for implementation*

(6) A description of watershed public participation mechanisms
(7) A description of watershed education mechanisms
(8) A description of the mechanism and implementation schedule for watershed-based land use planning
(9) A strategy for assessing the long-term effectiveness of the Watershed URMP

2. *Unified - The unified Watershed URMP document shall contain a section covering common activities conducted collectively by the Copermittees, to be written by the Principal Permittee, and the nine Watershed Specific URMP documents. The Principal Permittee shall submit the unified Watershed URMP document to the SDRWQCB by* ***January 31, 2003****.*

3. *Universal Reporting Requirements*

All individual and unified Watershed URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code section 13267 provides that "the regional board may require than any person who has discharged [...] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Discussion: Order No. 200-128 requires each Copermittee to participate in the development and implementation of applicable Watershed URMPs under Federal NPDES regulation 40 CFR 122.26(d)(2)(iv). The SDRWQCB must assess the Watershed URMPs to ensure that they are adequate to assess and address the specific water quality problems within each watershed. In order for the SDRWQCB to assess the Watershed URMPs, descriptions of the Watershed URMPs must be submitted to the SDRWQCB. The descriptions must detail all activities the applicable Copermittees are undertaking to implement the requirements of Watershed URMP section of Order No. 2001-01.

The submittal schedule for Watershed URMP documents is designed to provide the Copermittees adequate time to develop their Watershed URMPs. Several years are provided for the Copermittees to shift the focus of their urban runoff management efforts from a jurisdictional basis to a watershed basis. The provided submittal schedule should be more than adequate for the Copermittees to collaborate for the development and implementation of Watershed URMPs.

Compilation of the specific Watershed URMP documents into a unified Watershed URMP document by the Principal Permittee will ease the effort needed to assess and digest the information contained in the documents. The Principal Permittee's provision of a summary covering common activities conducted collectively by the Copermittees will provide a useful overview of

watershed efforts within the County of San Diego. This type of compilation of the Copermittees' documents has been recommended by the Copermittees in the past.

The SDRWQCB has discretion to require Submittal of Watershed URMP Document item L. in Order No. 2001-01 under the broad and specific legal authority cited above.

M. SUBMITTAL OF WATERSHED URMP ANNUAL REPORT

M. Submittal of Watershed URMP Annual Report states the following:

1. *Watershed Specific - Each Watershed Specific URMP Annual Report shall be a documentation of the activities conducted by watershed member Copermittees during the previous annual reporting period to meet the requirements of all components of the Watershed URMP section of this Order. Each Watershed URMP Annual Report shall, at a minimum, contain the following:*

    a. *Comprehensive description of all activities conducted by the watershed member Copermittees to meet all requirements of each component of Watershed URMP section J. of this Order;*

    b. *Public participation mechanisms utilized during the Watershed URMP implementation process;*

    c. *Mechanism for watershed based land use planning;*

    d. *Assessment of effectiveness of Watershed URMP;*

    e. *Proposed revisions to the Watershed URMP;*

    f. *A summary of watershed effort related data not included in the annual monitoring report (e.g., special investigations);*

    g. *Identification of water quality improvements or degradation;*

2. *Unified - The Unified Watershed URMP Annual Report shall contain a section covering common activities conducted collectively by the Copermittees, to be written by the Principal Permittee, and the nine Watershed Specific URMP Annual Reports. Each Lead Watershed Copermittee shall submit to the Principal Permittee a Watershed Specific URMP Annual Report by the date specified by the Principal Permittee. The Principal Permittee shall submit the Unified Watershed URMP Annual Report to the SDRWQCB by January 31, 2004 and every January 31 thereafter. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2004 shall cover the reporting period July 1, 2002 to June 30, 2003.*

3. *Universal Reporting Requirements*

    All individual and unified Watershed URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code section 13267 provides that "the regional board may require than any person who has discharged [...] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

Discussion: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv) require the Copermittees to develop and implement urban runoff management programs, of which the Watershed URMPs are a part. The SDRWQCB must assess the Watershed URMPs to ensure that they are adequate to assess and address the specific water quality problems within each watershed. In order for the SDRWQCB to assess the Watershed URMPs, the Copermittees must submit to the SDRWQCB annual reports describing all of the activities undertaken to meet the requirements of the Watershed URMP section of Order No. 2001-01.

The Watershed URMP Annual Reports can also be useful tools for the Copermittees. They provide a focus to review, update, or revise the URMPs on an annual basis. Successful and unsuccessful measures can be identified, helping to focus efforts on areas or issues which provide the greatest results. Areas or issues which have received insufficient efforts can also be identified and improved.

The SDRWQCB has the discretion to require Submittal of Watershed URMP Annual Report item M. in Order No. 2001-01 under the broad and specific legal authority cited above.

N. ALL COPERMITTEE COLLABORATION

N. All Copermittee Collaboration states the following:

> 1. *Each Copermittee shall collaborate with all other Copermittees regulated under this Order to address common issues, promote consistency among Jurisdictional Urban Runoff Management Programs (Jurisdictional URMPs) and Watershed Urban Runoff Management Programs (Watershed URMPs), and to plan and coordinate activities required under this Order.*
>
>   a. *Management Structure - All Copermittees shall jointly execute and submit to the SDRWQCB no later than **180** days after adoption of this Order, a Memorandum of Understanding, Joint Powers Authority, or other instrument of formal agreement which at a minimum provides a management structure for the following:*
>
>   - *Designation of joint responsibilities;*
>   - *Cost sharing (monitoring, education, fees, common equipment purchase, etc.);*
>   - *Decision making;*
>   - *Watershed activities;*
>   - *Information management of data and reports, including the requirements under this Order; and*
>   - *Any and all other collaborative arrangements for compliance with this Order.*
>
>   b. *All Copermittees shall jointly develop a standardized format(s) for all reports required under this Order (e.g., annual reports, monitoring reports, fiscal analysis reports, and program effectiveness reports, etc.). The standardized reporting format(s) shall be used by all Copermittees and shall include protocols for electronic reporting. The Principal Permittee shall submit the standardized format(s) to the SDRWQCB no later **than 180 days after adoption** of this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Discussion: Storm water runoff does not follow municipality boundaries, and often travels through many municipalities while flowing towards receiving waters. Municipalities' actions towards storm water can therefore have a cumulative impact upon shared receiving waters. Due to the interrelated nature of storm water management, Copermittee collaboration is necessary.

Copermittee collaboration results in more effective storm water management, while also aiding the process of complying with permit requirements. For example, formal agreements between Copermittees can help define Copermittee roles and ensure that all permit requirements are addressed. Agreements can also be made to share the costs necessary to maintain compliance with the permit. In addition, designation of a Principal

Permittee, through which reporting tasks can be coordinated, provides for standardization and compilation of required reports, thereby easing reporting efforts. This in turn improves digestion and assessment of report information, making the reports more useful to the Copermittees, which in turn can result in more effective urban runoff management.

The US EPA recommends Copermittee collaboration when it suggests "Coapplicants [...] may use interjurisdictional agreements to show adequate legal authority and to ensure planning, coordination, and the sharing of the resource burden of permit compliance. When more than one entity is submitting an application for a MS4 (either as coapplicants or as individual applicants for different parts of a system), the role of each party must be well defined. Each applicant or coapplicant must show the ability to fulfill its responsibilities, including legal authority for the separate storm sewers it owns or operates" (1992).

The SDRWQCB has discretion to require All Copermittee Collaboration item N. in Order 2001-01 under the broad and specific legal authority cited above.

O. PRINCIPAL PERMITTEE RESPONSIBILITIES

O. Principal Permittee Responsibilities states the following:

The Principal Permittee shall be the City of San Diego. The Principal Permittee shall, at a minimum:

1. *Serve as liaison between the Copermittees and the SDRWQCB on general permit issues.*

2. *Ensure coordination of permit activities among the Copermittees and facilitate collaboration on the development and implementation of programs required under this Order;*

3. *Integrate individual Copermittee documents and reports required under this Order into single unified documents and reports for submittal to the SDRWQCB as described below. If a reporting date falls on a non-working day or State Holiday, then the report is to be submitted on the following working day.*

   a. *Unified Jurisdictional URMP Document – The Principal Permittee shall submit the unified Jurisdictional URMP document to the SDRWQCB. The first part of the unified Jurisdictional URMP document (as described in section H.2.a.) shall be submitted within **180 days of adoption** of this Order. The second part of the unified Jurisdictional URMP document (as described in section H.2.b.) shall be submitted **within 365 days of adoption** of this Order.*

      The Principal Permittee shall be responsible for producing the sections of the unified Jurisdictional URMP document submittals covering common activities conducted by the Copermittees. As part of the second unified Jurisdictional URMP document submittal, the Principal Permittee shall be responsible for the development and writing of a stand alone Model SUSMP document meeting the requirements of section F.1.b.(2). of this Order. The Principal Permittee shall also be responsible for collecting and assembling the individual Jurisdictional URMP document submittals

covering the activities conducted by each individual Copermittee.

b. *Unified Jurisdictional URMP Annual Reports – The Principal Permittee shall submit unified Jurisdictional URMP Annual Reports to the SDRWQCB by January 31 of each year, beginning on* ***January 31, 2002****. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2002 shall cover the reporting period July 1, 2000 to June 30, 2001.*

   The Principal Permittee shall be responsible for producing the section of the unified Jurisdictional URMP Annual Reports covering common activities conducted by the Copermittees. The Principal Permittee shall also be responsible for collecting and assembling the individual Jurisdictional URMP Annual Reports covering the activities conducted by each individual Copermittee.

c. *Unified Watershed URMP Document – The Principal Permittee shall submit the unified Watershed URMP document to the SDRWQCB by* ***January 31, 2003****. The Principal Permittee shall be responsible for producing the section of the unified Watershed URMP document covering common activities conducted by the Copermittees. The Principal Permittee shall also be responsible for collecting and assembling the watershed specific Watershed URMP documents covering the activities conducted by each individual Copermittee.*

d. *Unified Watershed URMP Annual Report - The Principal Permittee shall submit unified Watershed URMP Annual Reports to the SDRWQCB by January 31 of each year, beginning on* ***January 31, 2004****. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 3, 2004 shall cover the reporting period July 1, 2002 to June 30, 2003.*

   The Principal Permittee shall be responsible for producing the section of the unified Watershed URMP Annual Reports covering common activities conducted by the Copermittees. The Principal Permittee shall also be responsible for collecting and assembling the watershed specific Watershed URMP Annual Reports covering the activities conducted by each individual Copermittee.

e. *Receiving Waters Monitoring and Reporting Program - The Principal Permittee shall be responsible for the writing and submittal of the Previous Monitoring and Future Recommendations Report. The report shall be submitted to the SDRWQCB within 180 days of adoption of this Order.*

f. *Receiving Waters Monitoring and Reporting Program - The Principal Permittee shall be responsible for the development and writing of the Receiving Waters Monitoring Program as it is outlined in Attachment B. The Principal Permittee shall submit the Receiving Waters Monitoring Program to the SDRWQCB within 180 days of adoption of this Order.*

g. *Receiving Waters Monitoring and Reporting Program - The Principal Permittee shall submit the Receiving Waters Monitoring Annual Report to the SDRWQCB on January 31 of each year, beginning on January 31, 2002.*

h. *Formal Agreements/Standardized Formats - The Principal Permittee shall submit to the SDRWQCB, within 180 days of adoption of this Order, a formal agreement between the Copermittees which provides a management structure for meeting the requirements of this Order (as described in section N.1.a.). The Principal Permittee shall submit to the SDRWQCB, within 180 days of adoption of this Order, standardized formats for all reports and documents required under this Order.*

i. Dry Weather Analytical Monitoring - The Principal Permittee shall collectively submit the Copermittees' dry weather analytical monitoring maps and procedures to the SDRWQCB within 180 days of adoption of this Order.

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(iii)(C) provides that "A regional authority may be responsible for submitting a permit application."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Discussion: Intergovernmental coordination is necessary in urban runoff management, given the transitory nature of urban runoff problems. A Principal Permittee will facilitate intergovernmental coordination, which will improve the development, implementation, and effectiveness of urban runoff management efforts within the region. One way in which a Principal Permittee will improve urban runoff management efforts is through the coordination of reporting tasks. This provides for the standardization and compilation of required reports, which in turn increases the ease with which report information can be digested and assessed. Standardized documents provide for easier assessment and application of report data, making reports more useful for Copermittees, which can result in more effective storm water management. The SDRWQCB has discretion to require Principal Permittee Responsibilities item O. in Order No. 2001-01 under the broad and specific legal authority cited above.

P. RECEIVING WATERS MONITORING AND REPORTING PROGRAM

P. Receiving Waters Monitoring and Reporting Program states the following:

1. *Pursuant to California Water Code section 13267, each Copermittee shall comply with Monitoring and Reporting Program for No. 2001-01 contained in **Attachment B** of this Order.*

2. *Each Copermittee shall also comply with standard provisions, reporting requirements, and notifications contained in **Attachment C** of this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Copermittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.26(d)(2)(iii). Standard provisions, reporting requirements, and notifications included in Attachment C are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41 (Federal NPDES regulation citations are provided in the Attachment).

Discussion: A comprehensive monitoring program is an important aspect of an urban runoff management program. The primary objectives of the monitoring program include, but are not limited to: 1) assessing compliance with Order No. 2001-01; 2) measuring the effectiveness of Urban Runoff Management Plans; 3) assessing the chemical, physical, and biological impacts to receiving waters resulting from urban runoff; and 4) assessing the overall health and evaluating long-term trends in receiving water quality. The monitoring and reporting requirements in Attachment B and C address this need for a comprehensive, flexible, iterative monitoring approach that is focused on compliance issues relevant to the different conditions existing in each watershed covered under this permit. A number of monitoring tools and approaches are available to achieve the objectives of this compliance oriented monitoring program. Order No. 2001-01 may be modified for a specified period of time to direct the Copermittees to participate in comprehensive regional monitoring activities conducted in the Southern California Bight during the term of the permit. This provision is consistent with other NPDES permits issued by the SDRWCB. Such participation maximizes scientific and financial resources using a wide ranging and cost-effective monitoring design to assess the chemical, physical and biological impacts of urban runoff on receiving waters throughout the Southern California Bight.

Using data collected from a monitoring program, urban runoff management efforts can be prioritized, helping limited resources be most effective in improving receiving water quality. For example, a monitoring program can provide data that can allow for specific receiving waters and watersheds to be targeted for urban runoff management efforts based on their need. Particular pollutants and their sources can also be identified and targeted using monitoring data. In addition, monitoring data can be useful in assessing the effectiveness of an urban runoff management program. Successful efforts that have resulted in receiving water quality improvements can be analyzed for application elsewhere, while areas that need greater efforts can also be identified. In general, a comprehensive monitoring program can supply a wealth of data that can be used in a wide range of applications for improving water quality.

The following is a discussion of each of the principal aspects of the proposed monitoring program required in Attachment B of Order No. 2001-01:

I. Previous Monitoring and Future Recommendations Report

The San Diego Copermittees have conducted wet weather monitoring since 1993. In addition, numerous other studies have been conducted in the Southern California Bight that bear on the issue of impacts to receiving waters resulting from municipal storm water discharge. The Receiving Waters Monitoring Program should be based on a sound understanding of storm water issues and the results of previous monitoring efforts to avoid duplicative or unproductive monitoring and to ensure that the data collected is the most scientifically valid and useful as practicable.

II. Receiving Waters Monitoring Program – Year Round

The objective of this program includes, but is not limited to, discharge characterization, source identification, and assessment of the chemical, physical, and biological impacts to receiving waters resulting from municipal urban runoff discharges.

A. Urban Stream Bioassessment Monitoring.
Bioassessment is the direct measurement of the biological and physical condition of receiving waters, such as rivers and streams, using benthic macroinvertebrates. This methodology utilizes in situ biological endpoints as an integrative measure of receiving water integrity. Because bioassessment focuses on living systems as integrators of cumulative impacts resulting from water quality degradation, it defines the ecological risks resulting from urban runoff that are as important to human health and well-being as the more obvious threats of toxic pollution or pathogens. Bioassessment not only identifies that an impact has occurred, but also measures the affect of the impact and tracks recovery when control or restoration measures have been taken.

B. Long-Term Mass Loading Monitoring
Wet weather monitoring by the Copermittees has focused on estimations of pollutant loadings in storm water runoff. Although this approach has drawbacks, it continues to represent the best long-term trend assessment of pollutant discharges to receiving waters from municipal storm water sewer systems.

C. Coastal Storm Drain Outfall Monitoring.
One of the primary impacts to coastal receiving waters is the loss of recreational beneficial uses resulting from urban runoff. This component of the monitoring program is meant to be integrated and coordinated with similar monitoring programs to address this issue.

D. Ambient Bay, Lagoon, and Coastal Receiving Water Monitoring
This monitoring program component addresses the overall health of the receiving waters and assesses the impact on these water bodies

from urban runoff. The Copermittees will develop a specific program for each bay, lagoon, and coastal area that integrates measures of the physical, chemical, and biological conditions of the water bodies as a function of urban runoff.

E. Toxic Hot Spots Monitoring in San Diego Bay
The Copermittees will develop a program to address the issue of the effects of urban runoff on toxic hot spots within San Diego Bay.

The SDRWQCB has discretion to require Receiving Waters Monitoring and Reporting Program item P. in Order No. 2001-01 under the broad and specific legal authority cited above.

Q. TASKS AND SUBMITTAL SUMMARY

Q. Tasks and Submittal Summary states the following:

The tasks and submittals required under this Order are summarized in Tables 5 and 6 below:

Table 5. Task Summary

Task No.	*Task*	*Permit Section*	*Completion Date*	*Frequency*
1	*Identify discharges not to be prohibited and BMPs required for treatment of discharges not prohibited*	*B.3.*	*180 days after adoption of Order*	*One Time*
2	*Examine field screening results to identify water quality problems resulting from non-prohibited non-storm water discharges, including follow-up of problems*	*B.5*	*January 31, 2002*	*Annually*
3	*Notify SDRWQCB of discharges causing or contributing to an exceedance of water quality standards*	*C.2.a.*	*Immediate*	*As Needed*
4	*Establish adequate legal authority to control pollutant discharges into and from MS4*	*D.1.*	*90 days after adoption of Order*	*One Time*
5	*Revise General Plan to incorporate water quality and watershed protection principles*	*F.1.a.*	*365 days after adoption of Order*	*One Time*
6	*Include conditions of approval in local permits*	*F.1.b.(1).*	*365 days after adoption of Order*	*One Time*
7	*Develop Model SUSMP*	*F.1.b.(2).*	*365 days after adoption of Order*	*One Time*
8	*Develop and adopt individual local SUSMP and amended ordinances*	*F.1.b.(2).*	*180 days after approval of Model SUSMP by SDRWQCB*	*One Time*
9	*Implement individual jurisdictional SUSMP*	*F.1.b.(2).*	*180 days after approval of Model SUSMP by SDRWQCB*	*Continuous*
10	*Revise environmental review processes and CEQA checklists*	*F.1.c.(1).*	*365 days after adoption of Order*	*One Time*
11	*Conduct education program for municipal planning and development review staff, project applicants, developers, contractors, and property owners*	*F.1.d.(1). and F.1.d.(2).*	*365 days after adoption of Order*	*Ongoing*

12	*Implement all requirements of Construction Component of Jurisdictional URMP*	*F.2.a. – F.2.h.*	*180 days after adoption of Order*	*Ongoing*
13	*Notify SDRWQCB of non-compliant construction sites*	*F.2.i*	*Within 24 hours of incidence of noncompliance*	*As Needed*
14	*Implement all requirements of Municipal Existing Development Component of Jurisdictional URMP*	*F.3.a.(1). – F.3.a.(8).*	*180 days after adoption of Order*	*Ongoing*
15	*Implement all requirements of Industrial Existing Development Component of Jurisdictional URMP*	*F.3.b.(1) – F.3.b.(8)*	*180 days after adoption of Order*	*Ongoing*
16	*Notify SDRWQCB of non-compliant industrial sites*	*F.3.b.8*	*Within 24 hours of incidence of noncompliance*	*As Needed*
17	*Implement all requirements of Commercial Existing Development Component of Jurisdictional URMP*	*F.3.c.(1) – F.3.c.(5)*	*180 days after adoption of Order*	*Ongoing*
18	*Implement all requirements of Residential Existing Development Component of Jurisdictional URMP*	*F.3.d.(1) – F.3.d.(3)*	*180 days after adoption of Order*	*Ongoing*
19	*Implement all requirements of Education Component of Jurisdictional URMP*	*F.4.a. – F.4.c.*	*180 days after adoption of Order*	*Ongoing*
20	*Implement all requirements of Illicit Connections/Illegal Discharges Component of Jurisdictional URMP*	*F.5.a. – F.5.i.*	*180 days after adoption of Order*	*Ongoing*
21	*Implement all requirements of Public Participation Component of Jurisdictional URMP*	*F.6.*	*180 days after adoption of Order*	*Ongoing*
22	*Develop strategy for assessment of Jurisdictional URMP effectiveness*	*F.7.a.*	*180 days after adoption of Order*	*One Time*
23	*Assess Jurisdictional URMP effectiveness*	*F.7.b.*	*January 31, 2002*	*Annually*
24	*Develop strategy for fiscal analysis of urban runoff management program*	*F.8.*	*180 days after adoption of Order*	*One Time*
25	*Conduct fiscal analysis of urban runoff management program in entirety*	*F.8.*	*January 31, 2002*	*Annually*
26	*Develop and implement Watershed URMP*	*J.2.*	*January 31, 2003*	*Ongoing*
27	*Execute formal agreement which provides management structure for meeting Order requirements*	*N.1.a.*	*180 days after adoption of Order*	*One Time*
28	*Develop standardized formats for all required reports of this Order*	*N.1.b.*	*180 days after adoption of Order*	*One Time*
29	*Develop Previous Monitoring and Future Recommendations Report*	*Attachment B*	*180 days after adoption of Order*	*One Time*
30	*Develop Receiving Waters Monitoring Program*	*Attachment B*	*180 days after adoption of Order*	*One Time*
31	*Implement Receiving Waters Monitoring Program*	*Attachment B*	*180 days after adoption of Order*	*Continuous*
32	*Develop dry weather analytical monitoring map and procedures*	*Attachment E*	*180 days after adoption of Order*	*One Time*
33	*Conduct dry weather analytical monitoring*	*Attachment E*	*January 31, 2002*	*Annually*
34	*Complete NPDES applications for issuance of renewal watershed based permits*	*Attachment C*	*At least 180 days prior to expiration of Order*	*One Time*
35	*Notify SDRWQCB of any incidence of non-compliance with this Order*	*R1, B.7 of Attachment C*	*Within 24 hours of incidence of non-compliance*	*As Needed*

Table 6. Submittal Summary

Submittal No.	*Submittal*	*Permit Section*	*Completion Date*	*Frequency*
1	*Submit identification of discharges not to be prohibited and BMPs required for treatment of discharges not prohibited*	*B.3.*	*180 days after adoption of Order*	*One Time*
2	*Report on discharges causing or contributing to an exceedance of water quality standards, including description of BMP implementation*	*C.2.a.*	*With individual Jurisdictional URMP Annual Reports*	*As Needed*
3	*Submit Certified Statement of Adequate Legal Authority*	*D.2.*	*90 days after adoption of Order*	*One Time*
4	*Submit certified statement if particular high priority construction sites are to be inspected monthly rather than weekly in the rainy season*	*F.2.g.(2).*	*180 days after adoption of Order and as needed thereafter*	*As Needed*
5	*Submit report on non-compliant construction sites*	*F.2.i.*	*Within 5 Days of incidence of non-compliance*	*As Needed*
6	*Submit report on non-compliant industrial sites*	*F.3.b.7.*	*Within 5 days of incidence of non compliance*	*As Needed*
7	*Submit to Principal Permittee first part of individual Jurisdictional URMP document covering requirements for all Components, excluding the Land-Use for New Development and Redevelopment Component*	*H.1.a.*	*Prior to 180 days after adoption of Order (Principal Permittee specifies date of submittal)*	*One Time*
8	*Submit to Principal Permittee second part of individual Jurisdictional URMP document covering Land-Use Planning for New Development and Redevelopment Component requirements*	*H.1.b.*	*Prior to 365 days after adoption of Order (Principal Permittee specifies date of submittal)*	*One Time*
9	*Principal Permittee shall submit to SDRWQCB first part of unified Jurisdictional URMP document covering requirements for all Components, excluding the Land-Use for New Development and Redevelopment Component*	*H.2.a.*	*180 days after adoption of Order*	*One Time*
10	*Principal Permittee shall submit to SDRWQCB second part of unified Jurisdictional URMP document covering Land-Use Planning for New Development and Redevelopment Component requirements, including Model SUSMP*	*H.2.b.*	*365 days after adoption of Order*	*One Time*
11	*Submit to SDRWQCB local SUSMP and amended ordinances*	*F.1.b.(2). and H.1.d.*	*180 days after approval of Model SUSMP*	*One Time*
12	*Submit to Principal Permittee individual Jurisdictional URMP Annual Report*	*I.1.*	*Prior to January 31, 2002 (Principal Permittee specifies date of submittal)*	*Annually*
13	*Principal Permittee shall submit 1st unified Jurisdictional URMP Annual Report to SDRWQCB*	*I.2.*	*January 31, 2002*	*One Time and Annually Thereafter*
14	*Submit to Principal Permittee Watershed Specific URMP document*	*L.1.*	*Prior to January 31, 2003 (Principal Permittee specifies date of submittal)*	*One Time*
15	*Principal Permittee shall submit unified Watershed Specific URMP document to*	*L.2.*	*January 31, 2003*	*One Time*

	SDRWQCB			
16	*Principal Permittee shall submit 2nd unified Jurisdictional URMP Annual Report to SDRWQCB*	*I.2.*	*January 31, 2003*	*One Time*
17	*Submit to Principal Permittee Watershed Specific URMP Annual Report*	*M.1.*	*Prior to January 31, 2004 (Principal Permittee specifies date of submittal)*	*Annually*
18	*Principal Permittee shall submit 1st unified Watershed Specific URMP Annual Report to SDRWQCB*	*M.2.*	*January 31, 2004*	*One Time and Annually Thereafter*
19	*Principal Permittee shall submit 3rd unified Jurisdictional URMP Annual Report to SDRWQCB*	*I.2.*	*January 31, 2004*	*One Time*
20	*Principal Permittee shall submit 2nd unified Watershed Specific URMP Annual Report to SDRWQCB*	*M.2.*	*January 31, 2005*	*One Time*
21	*Principal Permittee shall submit 4th unified Jurisdictional URMP Annual Report to SDRWQCB*	*I.2.*	*January 31, 2005*	*One Time*
22	*Principal Permittee shall submit 3rd unified Watershed Specific URMP Annual Report to SDRWQCB*	*M.2.*	*January 31, 2006*	*One Time*
23	*Principal Permittee shall submit 5th unified Jurisdictional URMP Annual Report to SDRWQCB*	*I.2.*	*January 31, 2006*	*One Time*
24	*Principal Permittee shall submit formal agreement between Copermittees which provides management structure for meeting Order requirements*	*N.1.a.*	*180 days after adoption of Order*	*One Time*
25	*Principal Permittee shall submit standardized formats for all reports required under this Order*	*N.1.b.*	*180 days after adoption of Order*	*One Time*
26	*Principal Permittee submits Previous Monitoring and Future Recommendations Report to SDRWQCB*	*Attachment B*	*180 days after adoption of Order*	*One Time*
27	*Principal Permittee submits Receiving Waters Monitoring Program document to SDRWQCB*	*Attachment B*	*180 days after adoption of Order*	*One Time*
28	*Principal Permittee submits Receiving Waters Monitoring Annual Report to SDRWQCB*	*Attachment B*	*January 31, 2002*	*Annually*
29	*Submit to Principal Permittee dry weather analytical monitoring map and procedures*	*Attachment E*	*Prior to 180 days after adoption of Order*	*One Time*
30	*Principal Permittee submits collective dry weather analytical monitoring maps and procedures*	*Attachment E*	*180 days after adoption of Order*	*One Time*
31	*Submit to Principal Permittee dry weather analytical monitoring results as part of individual Jurisdictional URMP Annual Report*	*Attachment E*	*Prior to January 31, 2002, as part of individual Jurisdictional URMP Annual Report*	*Annually*
32	*Principal Permittee shall submit NPDES applications for issuance of renewal watershed based permits*	*Attachment C*	*At least 180 days prior to expiration of this Order*	*One Time*
33	*Submit reports of any incidence of non-compliance with this Order*	*R.1, B.7 of Attachment C*	*Within 5 days of incidence of non compliance*	*As Needed*

Discussion: See the legal authority citations and discussions of the applicable permit sections.

R. STANDARD PROVISIONS, REPORTING REQUIREMENTS AND NOTIFICATIONS

R. Standard Provisions, Reporting Requirements and Notifications states the following:

1. *Each Copermittee shall comply with Standard Provisions, Reporting Requirements, and Notifications contained in **Attachment C** of this Order. This includes 24 hour/5day reporting requirements for any instance of non-compliance with this Order as described in section B.7 of Attachment C.*

2. *All plans, reports and subsequent amendments submitted in compliance with this Order shall be implemented immediately (or as otherwise specified) and shall be an enforceable part of this Order upon submission to the SDRWQCB. All submittals by Copermittees must be adequate to implement the requirements of this Order.*

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications included in Attachment C are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41 (Federal NPDES regulation citations are provided in the Attachment).

Federal NPDES regulation 40 CFR 122.44(l)(6) states "The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of non-compliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance."

Discussion: Implementation of plans, reports, and subsequent amendments by the Copermittees is an important requirement of Order No. 2001-01. Many of the requirements of Order No. 2001-01 rely upon the Copermittees' development and implementation of plans and programs. Without implementation, plans and programs will not improve water quality. For this reason, the plans must be implemented and shall be enforceable upon submission to the SDRWQCB. Incidences of noncompliance with the requirements of this Order must be reported to the SDRWCB within 24 hours, as required for all NPDES permits under Federal NPDES regulation 40 CFR 122.44(l)(6). The SDRWQCB has discretion to require Standard Provisions,

Reporting Requirements and Notifications item R. in Order No. 2001-01 under the broad and specific legal authority cited above.

VIII. REFERENCES

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U.S. Environmental Protection Agency. 2000. Storm Water Phase II Compliance Assistance Guide. Washington D.C. EPA 833-R-00-002.

Attachment 1

NPDES Municipal Storm Water Permit Justifications

Copermittee	Large or Medium MS4?	Contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the U.S[1]?
Carlsbad	Yes, by interrelationship[2] to Escondido, Oceanside, & Co. of San Diego.	Yes, Pacific Ocean Shoreline, Buena Vista Creek HA 904.20; Pine Street (Carlsbad), Carlsbad Village Pkwy (Carlsbad); Agua Hedionda Lagoon; and Buena Vista Lagoon;
Chula Vista	Yes, by population.[3]	Yes, San Diego Bay Shoreline, Telegraph HSA 909.11; Chula Vista Marina.
Coronado	No.	Yes, Pacific Ocean Shoreline, Coronado HA 910.10; North Beach, Loma Avenue, Pine Street, Sunset Park (Coronado); San Diego Bay, Near Coronado Bridge;
Del Mar	Yes, by interrelationship[2] to City of San Diego & Co. of San Diego.	Yes, Pacific Ocean Shoreline, San Dieguito HU 905.00; Del Mar (Anderson Canyon), San Dieguito Lagoon Mouth.
El Cajon	Yes, by interrelationship[2] to City of San Diego & Co. of San Diego.	Yes, Pacific Ocean Shoreline, San Diego HU 907.00, San Diego River Mouth, (Ocean Beach).
Encinitas	Yes, by interrelationship[2] to Escondido, Oceanside, & Co. of San Diego.	Yes, Pacific Ocean Shoreline, San Marcos HA 904.50; Moonlight State Beach.
Escondido	Yes, by population.[3]	No.
Imperial Beach	Yes, by interrelationship[2] to Chula Vista, City of San Diego & Co. of San Diego.	Yes, Pacific Ocean Shoreline, Tijuana HU 911.00; Tijuana River; and Tijuana River Estuary.
La Mesa	Yes, by interrelationship[2] to Chula Vista, City of San Diego & Co. of San Diego.	Yes, Pacific Ocean Shoreline, San Diego HU 907.00, San Diego River Mouth, (Ocean Beach); and Chollas Creek.
Lemon Grove	Yes, by interrelationship[2] to Chula Vista, City of San Diego & Co. of San Diego.	Yes, Chollas Creek.
National City	Yes, by interrelationship[2] to Chula Vista, City of San Diego & Co. of San Diego.	Yes, San Diego Bay, San Diego Naval Station; Seventh Street Channel; North of 24th Street Marine Terminal;
Oceanside	Yes, by population.[3]	Yes, Pacific Ocean Shoreline, San Luis Rey HU 903.00, San Luis Rey Rivermouth; Guajome Lake; Pacific Ocean Shoreline, Loma Alta Creek Mouth; and Loma Alta Slough.
Poway	Yes, by interrelationship[1] to City of San Diego & Co. of San Diego.	Yes, Pacific Ocean Shoreline, San Dieguito HU 905.00; Del Mar (Anderson Canyon), San Dieguito Lagoon Mouth; Mission Bay; and Los Penasquitos Lagoon.
San Diego, City	Yes, by population.[3]	Yes, see Attachment 2, 1998 Clean Water Act Section 303(d) List, specifically San Dieguito WMA, Mission Bay WMA, San Diego River WMA, San Diego Bay WMA, and Tijuana River WMA.
San Diego, Co.	Yes, by population.[3]	Yes, see Attachment 2, 1998 Clean Water Act Section 303(d) List, all WMAs.
San Diego Unified Port Dist.	Yes, by interrelationship[2] to Chula Vista, City of San Diego & Co. of San Diego.	Yes, see Attachment 2, 1998 Clean Water Act Section 303(d) List, specifically San Diego Bay WMA and Tijuana River WMA.
San Marcos	Yes, by interrelationship[2] to Escondido, Oceanside, & Co. of San Diego.	Yes, Agua Hedionda Lagoon.
Santee	Yes, by interrelationship[2] to City of San Diego & Co. of San Diego.	Yes, Pacific Ocean Shoreline, San Diego HU 907.00, San Diego River Mouth, (Ocean Beach).
Solana Beach	Yes, by interrelationship[2] to Escondido, Oceanside, City of San Diego & Co. of San Diego.	Yes, San Elijo Lagoon; and Pacific Ocean Shoreline, Escondido Creek HA 904.60, Solana Beach, San Elijo Lagoon.
Vista	Yes, by interrelationship[2] to Escondido, Oceanside & Co. of San Diego.	Yes, Buena Vista Lagoon; Pacific Ocean Shoreline, Buena Vista Creek HA 904.20, Pine Street, Carlsbad Village Pkwy; and Agua Hedionda Lagoon.

[1] See Attachment 2, 1998 Clean Water Act Section 303(d) List.

[2] See 40 CFR 122.26(b)(4)(iii) and (7)(iii).

[3] See Attachment 3, Copermittee Populations.

Attachment 2 1998 Clean Water Act Section 303(d) Impaired Waterbody List

Waterbody[1]	Watershed Management Area	HU, HA, or HSA[2]	Total Size[3]	Non Support[4]	Partially Support[5]	Exceeds Standard[6]	Sources[7]	Impairment[8]	Beneficial Uses[9]	TMDL Priority[10]	Level [11]	Start[12]	End[13]
Aliso Creek	Aliso Creek WMA	901.13	7.2 mi			1 mi	Point/ Nonpoint	Coliform	Rec-1, Rec-2	Medium	1	7/97	7/01
Aliso Creek, mouth of	Aliso Creek WMA	901.13	0.3 ac			0.3 ac	Point/ Nonpoint	Coliform	Rec-1, Rec-2	Medium	1	7/97	7/01
Pacific Ocean Shoreline, Aliso Beach HSA 901.13; Aliso Beach	Aliso Creek WMA	901.13	1 mi		0.01 mi		Point/ Nonpoint	Coliform	Rec-1, Rec-2	Medium	1	7/97	7/01
Agua Hedionda Lagoon	Carlsbad WMA	904.31	320 ac		5 ac		Point/ Nonpoint	Sediment	Aquatic life	Medium	3	7/04	7/07
						5 ac	Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/99	7/09
					5 ac		Point/ Nonpoint	Coliform	Shellfish harvest	Low	2	7/99	7/09
Buena Vista Lagoon	Carlsbad WMA	904.21	350 ac		350 ac		Point/ Nonpoint	Sediment	Aquatic life	Medium	3	7/04	7/07
					150 ac		Point/ Nonpoint	Nutrients	Aquatic life	Low	3	7/04	7/07
						350 ac	Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/99	7/09
Loma Alta Slough	Carlsbad WMA	904.10	8 ac	8 ac			Nonpoint	Eutrophication	Aquatic life	Low	2	7/99	7/09
						8 ac	Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/99	7/09
Pacific Ocean Shoreline, Loma Alta HA 904.10; Loma Alta Creek Mouth	Carlsbad WMA	904.10	1.5 mi	0.01 to 1 mi*			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
Pacific Ocean Shoreline, Buena Vista Creek HA 904.20; Pine Street (Carlsbad), Carlsbad Village Pkwy (Carlsbad)	Carlsbad WMA	904.20	2.2 mi	0.02 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
Pacific Ocean Shoreline, San Marcos HA 904.50; Moonlight State Beach	Carlsbad WMA	904.50	5.8 mi	0.01 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
Pacific Ocean Shoreline, Escondido Creek HA 904.60; Solana Beach, San Elijo Lagoon	Carlsbad WMA	904.60	3.0 mi	0.02 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09

Waterbody[1]	Watershed Management Area	HU, HA, or HSA[2]	Total Size[3]	Non Support[4]	Partially Support[5]	Exceeds Standard[6]	Sources[7]	Impairment[8]	Beneficial Uses[9]	TMDL Priority[10]	Level [11]	Start[12]	End[13]
San Elijo Lagoon	Carlsbad WMA	904.61	330 ac	330 ac			Point/ Nonpoint	Eutrophication	Aquatic life	Low	2	7/99	7/09
					150 ac		Point/ Nonpoint	Sediment	Aquatic life	Medium	3	7/04	7/07
						150 ac	Point/ Nonpoint	Coliform	Rec-1,Rec-2, Shellfish harvest, Fish consumption	Low	2	7/99	7/09
Famosa Slough	Mission Bay WMA	906.40	28 ac		28 ac		Nonpoint	Eutrophication	Aquatic life	Medium	3	7/05	7/08
Los Penasquitos Lagoon	Mission Bay WMA	906.10	385 ac	385 ac			Point/ Nonpoint	Sediment	Aquatic life	Medium	3	7/05	7/08
Mission Bay	Mission Bay WMA	906.30	1540 ac	1 ac			Point/ Nonpoint	Eutrophication, Lead	Aquatic life	Medium	3	7/05	7/08
		906.40 906.50		1540 ac			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
Pacific Ocean Shoreline, Scripps HA 906.30, El Paseo Grande, Del Oro, Vallecitos, Avenida de la Playa, Coast Blvd, Children's Pool, Ravina, Vista de la Playa, Bonair, Playa del Norte, Palomar (La Jolla); Tourmaline, Grand Avenue (Pacific Beach)	Mission Bay WMA	906.30	13 mi	0.13 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
Tecolote Creek	Mission Bay WMA	906.50	6 mi		6 mi		Point/ Nonpoint	Stormwater (Cadmium, Copper, Lead, Zinc, Toxicity)	Aquatic life	Medium	3	7/05	7/08
						6 mi	Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/99	7/09
Chollas Creek	San Diego Bay WMA	908.22	4.8 mi		1 mi		Point/ Nonpoint	Stormwater (Cadmium, Copper, Lead, Zinc, Toxicity)	Aquatic life	High	1	1/98	7/03
						1 mi	Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/99	7/09

Waterbody[1]	Watershed Management Area	HU, HA, or HSA[2]	Total Size[3]	Non Support[4]	Partially Support[5]	Exceeds Standard[6]	Sources[7]	Impairment[8]	Beneficial Uses[9]	TMDL Priority[10]	Level [11]	Start[12]	End[13]
Pacific Ocean Shoreline, Coronado HA 910.10; North Beach, Loma Avenue, Pine Street, Sunset Park (Coronado)	San Diego Bay WMA	910.00	10.2 mi	.04 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
San Diego Bay; Near Sub Base	San Diego Bay WMA	900.00	12000 ac	16 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03
San Diego Bay; Shelter Island Yacht Basin	San Diego Bay WMA	900.00	12000 ac			50 ac	Point/ Nonpoint	Dissolved copper	Aquatic life	High	1	1/98	7/03
San Diego Bay; Near Grape Street	San Diego Bay WMA	900.00	12000 ac	7 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03
San Diego Bay; Downtown Piers	San Diego Bay WMA	900.00	12000 ac	10 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03
San Diego Bay; Near Switzer Creek	San Diego Bay WMA	900.00	12000 ac	6 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03
San Diego Bay; Near Coronado Bridge	San Diego Bay WMA	900.00	12000 ac	30 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03
San Diego Bay; Near Chollas Creek	San Diego Bay WMA	900.00	12000 ac	14 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03
San Diego Bay; San Diego Naval Station	San Diego Bay WMA	900.00	12000 ac	76 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03
San Diego Bay; Seventh Street Channel	San Diego Bay WMA	900.00	12000 ac	9 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03

Waterbody[1]	Watershed Management Area	HU, HA, or HSA[2]	Total Size[3]	Non Support[4]	Partially Support[5]	Exceeds Standard[6]	Sources[7]	Impairment[8]	Beneficial Uses[9]	TMDL Priority[10]	Level [11]	Start[12]	End[13]
San Diego Bay; North of 24th Street Marine Terminal	San Diego Bay WMA	900.00	12000 ac	10 ac			Point/ Nonpoint	Benthic community degradation*, Toxicity*	Aquatic life	High	1	1/98	7/03
San Diego Bay Shoreline, Lindbergh HSA 908.21; G St, B St Pier	San Diego Bay WMA	908.21	8.7 mi	0.2 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/99	7/09
San Diego Bay Shoreline, Telegraph HSA 909.11; Chula Vista Marina	San Diego Bay WMA	909.11	0.5 mi	0.01 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/99	7/09
Pacific Ocean Shoreline, San Diego HU 907.00, San Diego River Mouth, (Ocean Beach)	San Diego River WMA	907.00	1.4 mi	0.02 to 0.5 mi*			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
Pacific Ocean Shoreline, San Dieguito HU 905.00; Del Mar (Anderson Canyon), San Dieguito Lagoon Mouth	San Dieguito River WMA	905.00	3.0 mi	0.02 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
Pacific Ocean Shoreline, Laguna Beach HSA 901.12; Laguna Beach, Irvine Cove-Riveria, Heisler Park -North, Main Beach (large), Laguna Ave, Cleo Street, Bluebird Canyon Road, Ocean Way, Dumond Dr, Lagunita/ Blue Lagoon, South Coast Hwy at Hospital, West St,	San Juan Creek WMA	901.12	2.5 mi		0.15 mi		Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/00	7/10
1000 Steps, Table Rock													
Pacific Ocean Shoreline, Dana Point HSA 901.14, Salt Creek (large), Salt Creek Service Rd, Dana Strand, North Beach Creek, Capo Beach	San Juan Creek WMA	901.14	6.5 mi		0.06 mi		Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/00	7/10
Pacific Ocean Shoreline, Lower San Juan HSA 901.27; San Juan Creek (large)	San Juan Creek WMA	901.3	1 mi		0.02 mi		Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/00	7/10

Waterbody[1]	Watershed Management Area	HU, HA, or HSA[2]	Total Size[3]	Non Support[4]	Partially Support[5]	Exceeds Standard[6]	Sources[7]	Impairment[8]	Beneficial Uses[9]	TMDL Priority[10]	Level [11]	Start[12]	End[13]
Pacific Ocean Shoreline, San Clemente HA 901.30; Poche Beach (large), Pico Drain (large), El Portal Stairs, Mariposa, Linda Lane, South Linda Lane, Lifeguard Headquarters, Trafalgar Canyon, Under Pier, La Ladera, Riveria Beach, Salem Tressel,	San Juan Creek WMA	901.30	7 mi		0.15 mi		Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/00	7/10
Cypress Shores													
San Juan Creek, Lower	San Juan Creek WMA	901.20	3.4 mi			1 mi	Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/00	7/10
San Juan Creek, Mouth	San Juan Creek WMA	901.20	2 ac			2 ac	Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/00	7/10
Guajome Lake	San Luis Rey River WMA	903.11	25 ac	25 ac			Point/ Nonpoint	Eutrophication	Aquatic life	Medium	3	7/08	7/11
Pacific Ocean Shoreline, San Luis Rey HU 903.00; San Luis Rey River Mouth	San Luis Rey River WMA	903.00	1 mi	0.01 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Shellfish harvest	Low	2	7/99	7/09
Rainbow Creek	Santa Margarita River WMA	902.20	11 mi	5 mi			Point/ Nonpoint	Rec-1, Rec-2, Eutrophication	Aquatic life	High	1	7/98	7/00
Santa Margarita Lagoon	Santa Margarita River WMA	902.11	268 ac	1 ac			Point/ Nonpoint	Eutrophication	Aquatic life, Rec-1, Rec-2	High	2	7/96	7/05
Pacific Ocean Shoreline, Tijuana HU 911.00; Tijuana	Tijuana River WMA	911.00	3.2 mi	3.2 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2	Low	2	7/98	7/11
River			3.2 mi		3.2 mi		Point/ Nonpoint	Coliform	Shellfish harvest, Fish consumption	Low	2	7/98	7/11
Tijuana River	Tijuana River WMA	911.11	7 mi	7 mi			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Fish consumption	Low	2	7/98	7/11
				7 mi			Point/ Nonpoint	Eutrophication, Low dissolved oxygen, Solids, Trace metals, Synthetic organics, Pesticides	Aquatic life	Low	3	7/98	7/11

Waterbody[1]	Watershed Management Area	HU, HA, or HSA[2]	Total Size[3]	Non Support[4]	Partially Support[5]	Exceeds Standard[6]	Sources[7]	Impairment[8]	Beneficial Uses[9]	TMDL Priority[10]	Level [11]	Start[12]	End[13]
				7 mi			Point/ Nonpoint	Eutrophication, Trash, Pesticides, Synthetic organics, Trace metals	Fish consumption	Low	3	7/98	7/11
Tijuana River Estuary	Tijuana River WMA	911.11	150 ac		1 ac		Point/ Nonpoint	Nickel, Thallium, Lead, Pesticides, Eutrophication, Trash	Aquatic life	Low	3	7/98	7/11
				1 ac			Point/ Nonpoint	Pesticides	Fish consumption	Low	3	7/98	7/11
				150 ac			Point/ Nonpoint	Coliform	Rec-1, Rec-2, Fish consumption, Shellfish harvest	Low	2	7/98	7/11

Attachment 3

Copermittee Populations (1990 U.S. Census Bureau)

Copermittee	Population
Carlsbad	63,126
Chula Vista	135,163
Coronado	26,540
Del Mar	4,860
El Cajon	88,693
Encinitas	55,386
Escondido	108,635
Imperial Beach	26,512
La Mesa	52,931
Lemon Grove	23,984
National City	54,249
Oceanside	128,398
Poway	43,516
San Diego, City	1,110,549
San Diego, County	398,764
San Diego Unified Port District	0
San Marcos	38,974
Santee	52,902
Solana Beach	12,962
Vista	71,872

Attachment 4

Discussion of Municipal Storm Water Permitting and the Watershed Approach

Municipal Storm Water Requirements, Order No. 2001-01

Under the municipal storm water requirements, municipalities are responsible for pollutant discharges into and out of storm water conveyance systems from land uses within their jurisdiction and watershed. This responsibility is based in large part on land use and permitting authority, and underscores the direct link between land use decisions and the resulting long-term water quality consequences of those decisions. Accordingly, the municipal storm water requirements require municipalities to impose controls on existing and future development as necessary to reduce pollutant discharges. A critical requirement of your municipal storm water requirements is to obtain and enforce your legal authorities (i.e., local ordinances, permits) as necessary to maintain (or restore) your compliance with your municipal storm water requirements.

Municipal storm water requirements also specifically direct permittees to prohibit illicit discharges[96] from entering into their storm water conveyance systems. This means requirements to detect (actively seek out) polluted runoff entering your system, identify the source(s) causing the problem, and eliminate the problem(s).

SDRWQCB's Watershed Approach

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[96] The term "illicit discharge" is defined in the federal storm water regulations at 40 CFR 122.26 in very board terms. An illicit discharge is any discharge which is not composed entirely of "storm water". Storm water is one of two components of "urban runoff". Urban runoff is the correct term for any and all flows in a municipal storm water conveyance system. Storm water is defined as any flow that originated from precipitation only. Non-storm water is the "catch-all" phrase referring to all flows in the system that originated from any source other than precipitation.

Technically, uncontaminated rainwater is the only "allowable" flow in the storm water conveyance system. As a practical matter, we are currently assuming a rather lenient enforcement position against municipalities for discharging precipitation that has picked up urban pollutants. We have however assumed a much more aggressive enforcement position against municipalities that have failed to enforce their own legal authorities or implement appropriate source control and structural best management practices (BMPs) to the maximum extent practicable. Such BMPs must effectively reduce or eliminate pollutants that would otherwise be available for transport to receiving waters by precipitation. The SDRWQCB has also taken a much more stringent view of runoff originating from sources other than precipitation (e.g., excess irrigation, car washing, etc.) which convey urban pollutants. Such non-storm water flows are prohibited under the municipal storm water requirements. In all cases, the SDRWQCB looks to see if the responsible municipality(s) have truly demonstrated a "good faith" and thorough effort to find, reduce or eliminate pollutants, and their sources. Such good faith efforts must include enforcement of local ordinances and permits, education efforts that are focused on pollutant(s) of concern, and implementation of effective source control and structural BMPs. These efforts should concentrate on man-made, man-accelerated, or "controllable" sources, rather than on uncontrollable sources (e.g., focus on eliminating pet waste rather than wild animal waste).

The term "watershed approach" can mean different things to different people. It often involves several agencies, organizations, and communities addressing numerous environmental concerns. When the SDRWQCB defines a watershed approach, as it has in the document entitled "Watershed Management Approach for the San Diego Region,"[97] it is limiting its concerns exclusively to water quality issues.

The SDRWQCB's watershed approach considers each geographic watershed (or subwatershed) as a whole and seeks to identify and mitigate all sources of pollutants (both point and non-point sources) throughout the watershed which contribute to the impairment of common downstream receiving waters. This definition emphasizes the important contribution (of pollutants and flow) from "inland sources" to "coastal problems", such as those that have historically plagued San Diego are Beaches. Like the municipal storm water requirements, one of the most important steps in the SDRWQCB's watershed effort is the identification and elimination of the sources causing such water quality impairments.

A word about what a watershed approach is "not" is also in order. The SDRWQCB's (or any one else's) watershed approach is not: a reduction in the responsibility or authority of the SDRWQCB; an abdication of responsibility or authority by the SDRWQCB; a reduction in the tools at the disposal of the SDRWQCB; or a reduction in or limit on the discretion of the SDRWQCB.

Nexus Between Municipal Storm Water Permit and Watershed Approach

The municipal storm water requirements and the SDRWQCB's watershed approach are fully consistent with each other. Both have the same overall objectives and both direct many of the same specific actions; for example identification and elimination sources of pollutants. The municipal storm water requirements is a traditional regulatory measure. The "watershed approach" is, at the moment, largely a non-regulatory measure.

It is important to understand that regulatory and non-regulatory measures are not mutually exclusive. The premise that the watershed approach "contrasts" with regulation is incorrect. The best way to explain the relationship between the two is to say that a "watershed approach" includes, (but is not limited to) regulation. Waste discharge requirements may or may not include a watershed effort. A community watershed effort often involves issues beyond the scope of complying with waste discharge requirements, but compliance with applicable requirements is always an essential component of any watershed effort. Furthermore, because urban runoff pollution is inextricably linked to cumulative pollutants in runoff

97 "Watershed Management Approach for the San Diego Region"; Sixth version (draft). Regional Water Quality Control Board, San Diego Region; January 7, 2000.

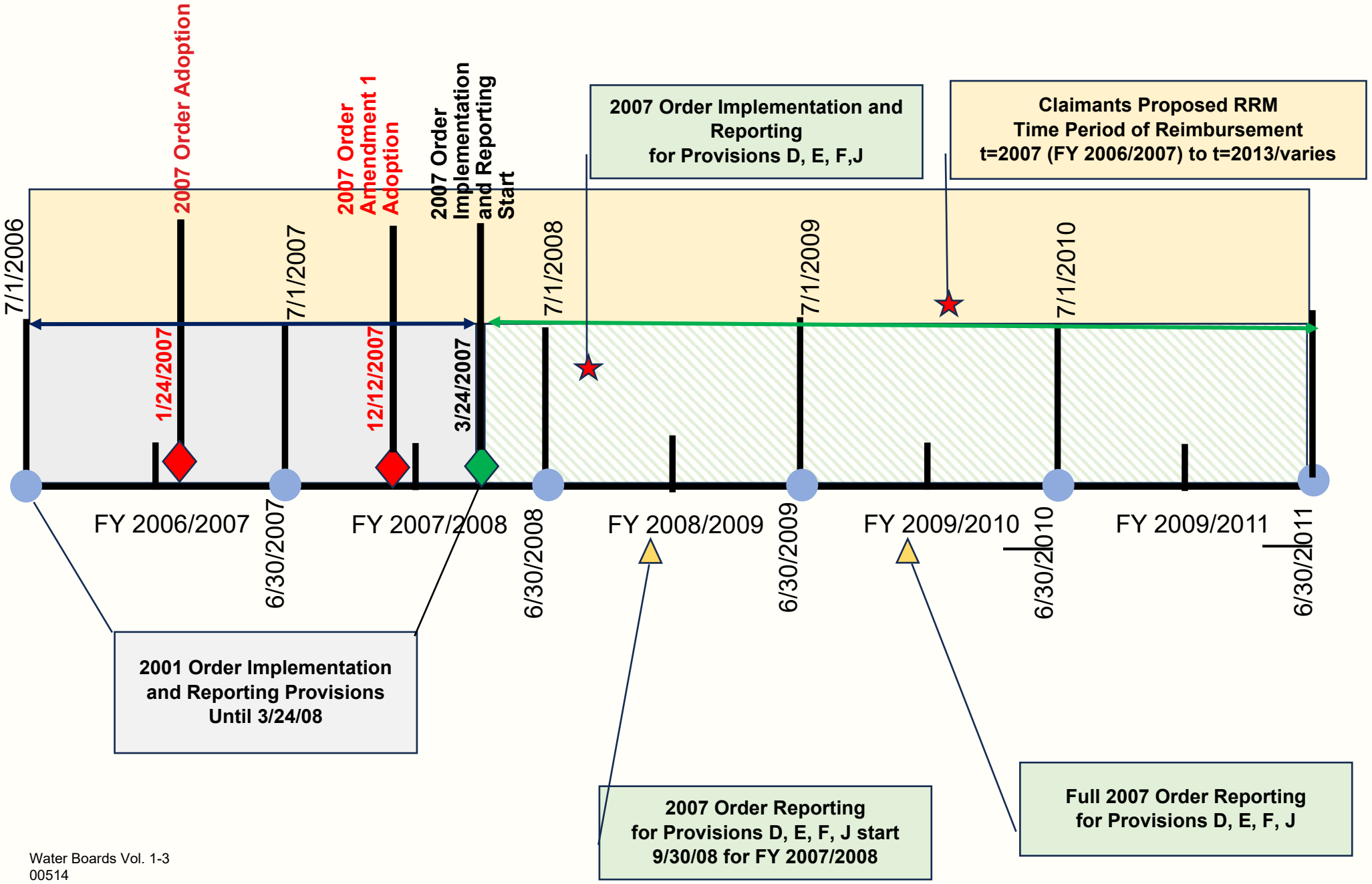
contributed by all sources in a watershed, it makes a great deal of sense that permittees would choose to implement the requirements of the municipal storm water permit in the context of a watershed approach. However, whether or not you choose to use a watershed approach to do so, it is each permittees responsibility to comply with the municipal storm water requirements.

In addition to fully supporting a watershed approach for protecting water quality, our agency is in a gradual process of shifting our regulatory efforts towards a watershed (rather than programmatic[98]) basis. This means that in the future waste discharge requirements may be issued on a watershed basis. At this time, a few waste discharge requirements "encourage" required activities to be conducted on a watershed basis. In the future, it is likely that waste discharge requirements will "require" that activities be conducted on a watershed basis by all dischargers within the watershed in order to address common water quality problems. The fact that many watershed efforts today are voluntary, but may soon be required under waste discharge requirements, illustrates the "three-tiered" watershed approach described in the SDRWQCB's "Watershed Management Approach for the San Diego Region". The three-tiered concept embodies the gradual shift from "tier one" stakeholder driven voluntary watershed efforts to "tier three" efforts mandated by waste discharge requirements.

To the extent that a watershed stakeholder is also subject to waste discharge requirements, a tier one, or voluntary watershed effort can only exist in conjunction with, and acknowledgment of, the mandatory requirements of the waste discharge requirements. This is the current situation for San Diego area Copermittees. It is the responsibility of the SDRWQB to ensure that you are complying with your municipal storm water requirements and to the extent that you are not, to take appropriate enforcement action.

98 Our office is currently organized into discrete program units e.g., ground water unit, surface water unit, storm water unit, landfill unit, etc.

Attachment 2
Summary Timeline of Order 2007 Implementation Dates for Claimant Reimbursable Activities A- H



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California 92123

MINUTES OF MEETING
DECEMBER 12, 2007

At 9:00 a.m. Chairwoman Ritschel called to order the meeting of the California Regional Water Quality Control Board, San Diego Region at the Regional Water Quality Control Board, 9174 Sky Park Court, San Diego, California.

Chairwomen Ritschel introduced and welcomed two new members on the Board, Wayne Rayfield and Kris Weber. She also congratulated Mr. Anderson on his reappointment.

Item 1 – Roll Call and Introductions: Board Members Present: Susan Ritschel, Richard Wright, Eric Anderson, Elizabeth Pearson Schneider, Kris Weber, and Wayne Rayfield.

Staff Present: John Robertus, Michael McCann, David Barker, Lori Costa, John Odermatt, Brian Kelley, Mark Alpert, John Anderson, Julie Chan, Bob Morris, Jimmy Smith, Chiara Clemente, Craig Carlisle, Dave Gibson, DiAnne Broussard, Michelle Mata, Kristin Schwall, Frank Melbourn, Rebecca Stewart, Anthony Felix, Ben Neill, Chris Means, Christina Arias, Tom Alo, Mike Porter, Phil Hammer, Ben Tobler, Wayne Chiu, Jeremy Haas, Amy Mecklenborg, Jody Ebsen, Ben James, Helen Yu, Robert Pierce, Amy Grove, Carol Tamaki, Pete Peuron, Lynn Berlad, Linda Halabi, and Marleen Carvajal. Others Present on behalf of the Regional Board: State Water Resources Control Board – Catherine George, Jorge Leon, and Frances Spivy-Weber. Kennedy Court Reporters: Lori Anzalone.

Public Attendance: Paul Cline – self; Dick Runge – South Coast Water District; Sue Kalena – Hunsaker; Tara Michie – Hulo Source; Kevin Carr, Pat Dennis, Patrick Owen – SeaWorld; Daniel Johnson, Harry Bishop, Ryan Marcos, Cristobal Ramirez, Andy Zahurack, Tracy Thompson – SCS Engineers; Don Trueblood, Anthony Kouzen – Brown & Caldwell; Robert Mooney – Merkel & Assoc. Glenn Pruim – Carlsbad; James O'Day, Joseph DeStefano, Sara Agahi, Barry Pulver, Jason Forat, Chris Hanger – County of San Diego; Mark Gold – Heal the Bay; Cora Long – City of Lemon Grove; Jerry Marcotte, Gian Villarreal, Laurie Berman, Susanne Glasgow, Con Kontast – Caltrans; Elaine Lukey – City of Carlsbad; Patrick Millich – Lee & Assoc.; Mayor Paul Glaab, Nancy Palmer – City of Laguna Niguel; Khosro Aminpour, Dave Meyer – City of Chula Vista; Stefanie Warren – San Diego Unified School District; Bob Jordan – SMWD; Jayne Joy – EMWD; Cindy Lin – USEPA; Jaime Campos – City of El Cajon; Susan Given, Mary Anne Skorpanich, Chris Crompton, Amanda Carr – County of Orange; Ruth Kolb, Drew Kleis, Fritz Orlieb – City of San Diego; Patti Krebs – IEA; Peggy Strand – Best, Best & Krieger; Erik Steenblock – City of Encinitas; Will Holoman – City of

Laguna Beach; Greg Hulsizer, Lorenzo Garrido – South Bay Expressway; Jacqueline Dompe – EDWA; Terry Rodgers – San Diego Union Tribune; Cheryl Filar – City of Escondido; Jayne Strommer – City of Vista; Mo. Lahsaie, Cynthia Mallett – City of Oceanside; Lisa Zawaski, Brad Fowler – City of Dana Point; Gabriel Solmer, Livia Borak – San Diego Coastkeeper; Marco Gonzalez – Coast Law Group; Ariadna Wall – self; Ed Kimura – Sierra Club; Peter Olah, John Bergin – Ashby; Linda Mitrovich – Solution Strategies; Don Bullock – North County Transit District; Ann McCann – self.

Item 2 – Public Forum
Sara Agahi, Country of San Diego, invited the Board to a copermittees meeting on December 13 to hear State Board Member Gary Wolff give a presentation on Low Impact Development and Watershed Management.

Gabriel Solmer, San Diego Coastkeeper, welcomed the new Board Members. Ms. Solmer also congratulated Mr. Wright on being awarded the Ronald F. Abler Honors for Distinguished Service of the Association of American Geographers for 2008.

Chairwoman Ritschel announced that Items 13, 16, and 17 were postponed.

Item 5 – Recognition: Resolution of Appreciation for Daniel Johnson (tentative Resolution No. R9-2007-0220) *(John Robertus)*

Ms. Schneider made a motion to adopt Resolution R9-2007-0220. The motion was seconded by Mr. Wright and approved by unanimous vote.

Chairwoman Ritschel presented the Resolution of Appreciation to Mr. Johnson.

Board Member King arrived at 9:15 a.m.

Item 3 – Minutes of Board Meeting of November 14, 2007
This record of the minutes of the meeting on this date is not intended as the official record of events and is solely for administrative convenience. A more detailed account of the proceedings is available upon request, consisting of a tape recording and a court reporter transcribed record. Please contact the Regional Board office for assistance.

Mr. Robertus noted three corrections included in an errata:

1) Page 3, Item 7, the acronym "SDR" should be corrected to read "WDR."
2) Page 6, Item 11, the sentence "This Closed Session was held" should be added at the end of the item.
3) Page 6, Items 12-14, the words "The Closed Sessions, Items 12-14, were not held" should be added at the end of Item 14.

Mr. Anderson moved approval of the November 14, 2007 minutes with errata. The motion was seconded by Mr. King and approved with abstention by Ms. Schneider, Mr. Weber, and Mr. Rayfield.

Consent Calendar: Items 6 through 11 are considered non-controversial issues. (NOTE: If there is public interest, concern or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

Item 10 was removed from the consent calendar due to public request.

Staff Counsel, Catherine George, said that Item 6 was a rescission of a Cease and Desist Order therefore needed a roll call vote.

Item 7 – New Waste Discharge Requirements: California Department of Transportation (Caltrans), Tecate Truck Inspection Station. The San Diego Regional Board will consider adoption of a tentative Order which would establish waste discharge requirements for the discharge of up to 500 gallons per day of waste from a conventional septic tank and leach field at the Tecate Truck Inspection Station, San Diego County. (Tentative Order No. R9-2007-0148) (*Michelle Mata*)

Item 8 – Administrative Assessment of Civil Liability against the San Diego Unified School District for violations of Statewide General Construction Storm Water Permit, at the Scripps Ranch Middle School, San Diego, California. The Regional Board will consider comments received during the public review period and decide on an order accepting the discharger's waiver of hearing and payment in full of the $128,000 recommended liability. (Tentative Order No. R9-2007-0210) *(Pete Peuron)*

Item 9 – Administrative Assessment of Civil Liability against Eastern Municipal Water District, for violation of the Statewide General WDR for Sanitary Sewer Systems for the discharge of 1.07 million gallons of untreated sewage to Murrieta Creek, Temecula, Calif. The Regional Board will consider comments received during the public review period and decide on an order accepting the discharger's waiver of hearing and payment in full of the $53,500 recommended liability. (Tentative Order No. R9-2007-0217) *(Charles Cheng)*

Item 11 – NPDES Permit Addendum: The Regional Board will consider adoption of Tentative Addendum No. 1 to Order No. R9-2007-0001, NPDES Permit No. CAS0108758, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District and the San Diego County Regional Airport Authority. Tentative Addendum No. 1 to Order No. R9-2007-0001 will extend the deadlines of certain permit requirements by 60 days. The extension of the deadlines is necessitated by the recent wildfires of October 2007 and the unforeseeable delays in previously scheduled work required by Order No. R9-2007-0001 that has resulted from the wildfires. *(Christina Arias)*

Ms. Schneider made a motion to approve Items 7,8,9, and 11. The motion was seconded by Mr. Anderson and approved by unanimous vote.

Item 6 – Rescission of Cease and Desist Order No. 98-39 and addenda thereto: San Marcos Landfill, San Diego County (tentative Order No. R9-2007-0206) *(Amy Grove)*

Ms. Schneider made a motion to approve Item 6. The motion was seconded by Mr. Anderson and approved by a 7-0 vote.

Remainder of the Agenda (Non-Consent Items):

Item 10 – NPDES Permit Revision: SeaWorld San Diego. The Regional Board will consider amending SeaWorld's existing NPDES permit to establish waste discharge requirements for discharges of waste from SeaWorld's aerial fireworks displays to Mission Bay, San Diego. (Tentative Addendum No. 1 to Order No. 2005-0091, NPDES No. CA0107336) *(Michelle Mata)*

Staff member Michelle Mata gave the presentation.

Other speakers included:
Cindy Lin – US EPA
Marco Gonzalez – Coast Law Group
Ariadna Wall
Pat Dennis – represented SeaWorld

Board Members asked questions of staff.

Ms. Schneider made a motion to approve the Order with errata adding language explaining the special circumstances as to why WDRs for aerial fireworks displays were being required. The motion did not have a second therefore the motion failed.

Mr. Rayfield made a motion to approve the Order with errata to require testing within 24 hours after the fireworks display and require a third test within 24 hours of the Labor Day holiday display. In his motion, Mr. Rayfield also included the language suggested by Ms. Schneider in her previous motion. The motion was seconded by Mr. Wright.

Ms. George asked staff to write the revised language for Board Members to review before a vote was taken.

After a brief recess, senior staff member Brian Kelley read the errata to the Board:

Finding 2, end of first paragraph: "Mission Bay is unique due to the restricted circulation of waters within the Bay, the shallow depth of the Bay in the vicinity of the fireworks events, and because of the high frequency of fireworks events discharged by SeaWorld in that area."

The motion was then approved with opposition by Ms. Schneider.

Item 12 – Total Maximum Daily Loads for Indicator Bacteria, Project I - Beaches and Creeks in the San Diego Region. The Regional Board will deliberate and consider adopting and amendment incorporating the TMDLs into the Basin Plan. (Tentative Resolution No. R9-2007-0044) *(Benjamin Tobler)*

Staff member Ben Tobler gave the presentation.

Board Members asked questions of staff. Mr. Robertus, Mr. Tobler, Ms. Julie Chan, and Mr. David Barker addressed their questions.

Other speakers included:
Mayor Paul Glaab – City of Laguna Niquel
Nancy Palmer – City of Laguna Niguel
Cindy Lin – US EPA
Drew Kleis – City of San Diego
Mark Gold – Heal the Bay
Marco Gonzalez – Coast Law Group
Gabriel Solmer – San Diego Coastkeeper
Livia Borak – San Diego Coastkeeper
Will Holoman – City of Laguna Beach
Lisa Zawaski – City of Dana Point
Brad Fowler – City of Dana Point
Ed Kimura – Sierra Club
Chris Crompton – County of Orange
Mary Anne Skorpanich – County of Orange

Ms. Chan made closing comments.

The meeting was recessed for Closed Session and lunch at 12:27 p.m.

Item 20 – *Closed Session* - Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The Regional Board may meet in closed session to discuss ongoing litigation for the following cases:

Litigation Filed against the Regional Water Board

Schutte & Koerting, Inc. and Ametek, Inc. v. California State Water Resources Control Board and Regional Water Quality Control Board, San Diego Region, Verified Petition for Writ of Mandate for Breach of Contract. San Diego County Superior Court, Case No. GIC 822750 (filed December 2003). *(John Anderson)*

Schutte & Koerting, Inc. and Ametek, Inc. v. California State Water Resources Control Board and Regional Water Quality Control Board, San Diego Region,

Verified Petition for Writ of Mandate for Breach of Contract. San Diego County Superior Court, Case No. GIC 824706 (filed January 2004). *(John Anderson)*

Bajagua, LLC v. California State Water Resources Control Board, California Water Quality Control Board, San Diego Region, et al., Petition for Writ of Mandate. San Diego County Superior Court, Case No. 37-2007-00067722-CU-WM-CTL (filed June 2007). *(John Robertus)*

Surfrider Foundation v. California Regional Water Quality Control Board -- San Diego Region and California State Water Resources Control Board; (Cabrillo Power I, LLC, Real Party-in-Interest), Petition for Writ of Mandate. San Diego County Superior Court, Case No. 37 2007-00069621-CU-PT-CTL (filed July 2007). *(John Odermatt)*

William G. Dickerson and Heidi Dickerson, Husband and Wife; Larry Gunning and Penelope L. Gunning, Husband and Wife; and Perry & Papenhausen, Inc., a California Corporation v. San Diego Regional Water Quality Control Board, a Public Entity, Petition for Writ of Mandate. San Diego County Superior Court, Case No. 37-2007-00075846-CU-WM-CTL (filed September 2007). *(Frank Melbourn)*

Litigation filed by the Regional Water Board against other parties

People of the State of California Ex Rel. the Regional Water Quality Control Board, San Diego Region v. Robert Ortega, an individual in his capacity as Acting Commissioner of the International Boundary and Water Commission, United States Section, et al., Complaint for Violations of the Clean Water Act and Related State Law Claims. United States District Court, Southern District of California, Case No. 01-CV-027BTM(JFS) (filed February 2001). *(John Robertus)*

This Closed Session was held.

The meeting reconvened at 1:40 p.m.

Item 12 - Continued

Board Members asked questions of staff.

Ruth Kolb, City of San Diego, responded to a Board Member question.

After further questions of staff, Chairwoman Ritschel closed the Pubic Hearing then moved to Board Member deliberation.

After Board Member deliberation and discussions with staff, Ms. George requested that the item be continued after a brief break to allow staff to discuss changes to the language. Board Members concurred.

Item 18 – STATUS REPORT: State Route 125 Toll Road - Caltrans and South Bay Expressway; the Toll Road, scheduled to open on November 19, 2007, lacks fully vegetated post-construction Best Management Practices (BMPs) to prevent erosion and manage sediment and achieve an 80% removal efficiency for total metals and suspended solids. Such BMPs are required pursuant to Resolution No. 2001-51, Clean Water Act Section 401 Water Quality Certification for the State Route 125 South Toll Road Project, which was adopted by the Regional Board on April 23, 2001. The Regional Board will hear a report on the status of the implementation of the post-construction BMPs. *(Christina Arias)*

Staff member Christina Arias gave the presentation.

Laurie Berman, Caltrans, and Greg Hulsizer, South Bay Expressway, also gave a presentation.

Jacqueline Dompe, EDWA, gave an update on the South Bay Expressway.

Lorenzo Garrido, South Bay Expressway, answered a question asked by Mr. Wright about the use of reclaimed water.

Mr. Rayfield expressed his concern with them being so far out of compliance with the permit. Mr. Robertus made comments.

Mr. Wright asked that monthly status reports be included in the Executive Officer's Report and for a status report by staff approximately every third meeting.

Item 19 – Approval of Year 2008 Board Meeting Schedule *(John Robertus)*

Chairwoman Ritschel made a motion to approve the schedule. The motion was seconded by Mr. Rayfield and approved by unanimous vote.

Item 4 – Chairman's, Board Members', State Board liaison's and Executive Officer's Reports: These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

Mr. Robertus reported that State Board Member Gary Wolff would be visiting Regional Board staff to discuss various issues such as once through cooling and the regulation of storm water.

Mr. McCann reported on the fire recovery efforts in San Diego County.

Mr. Robertus briefly spoke about the 303d List of Impaired Waters and the San Diego Bay Shipyard Sediment Site Cleanup Status.

Chairwoman Ritschel asked about a spill listed on the SSO Report by the Naval Station Palmer Hall Barracks. Senior staff member Mark Alpert responded.

Mr. King asked a question about Poseidon Resources' proposed Carlsbad Desalinization Project. Mr. Robertus and staff member Eric Becker responded.

Mr. Wright reported that he, Mr. Anderson, Mr. King, and Mr. Robertus attended the WQCC on December 10 & 11 in Sacramento. He said they all spoke on regional issues. The three members reported on some of the other issues discussed at the meeting.

Item 12 – Continued

Ms. George provided the Board with the recommended changes. Board Members were in agreement with the changes.

Chairwoman Ritschel reopened the Public Hearing to allow the public to comment on the proposed changes.

Speakers included:
Chris Hanger – County of San Diego
Gabriel Solmer – San Diego Coastkeeper
Nancy Palmer – City of Laguna Niguel

Mr. Tobler recommended closing the Public Hearing, adopting the Resolution with errata, adding new Finding No. 23, and replacing Resolution Paragraph No. 2.

Ms. Schneider made a motion to adopt Resolution No. R9-2007-0044 with the errata and amendment recommended by staff. The motion was seconded by Mr. Rayfield and approved by unanimous vote.

Item 13 – Reissuance of Waste Discharge Requirements and NPDES Permit CAG919002 for discharge from Groundwater Extraction waste to Surface Waters within the San Diego Region Except for San Diego Bay. If adopted, Tentative Order No. R9-2007-0071, would supersede the current SDR Order No. R9-2001-0096. (Tentative Order No. R9-2007-0071) *(Vicente Rodriguez)*

This item was postponed.

Item 14 – PUBLIC HEARING: Administrative Assessment of Civil Liability against Ashby USA, LLC for violation of its Clean Water Act Section 401 Water Quality Certification for the Roripaugh Ranch Residential Development, Temecula, California. The Regional Board will consider whether to raise, lower, or reject assessment of

$546,250 civil liability recommended in Complaint No. R9-2007-0064. If the discharger elects to waive their right to a hearing, the Regional Board will consider comments received during the public review period and decide on an order accepting payment of the proposed liability and waiver of hearing. (Tentative Order No. R9-2007-0221) *(Rebecca Stewart)*

Mr. Weber recused himself from the item.

Assistant Executive Officer, Michael McCann, explained the split functions of staff on enforcement items.

Other speakers included:
Peter Olah Ashby USA
Linda Mitrovich – Solution Strategies, Inc., requested a continuance.

Staff member Rebecca Stewart explained why staff felt the item should not be continued to a later date.

Mr. Robertus recommended that the Board proceed with the Public Hearing.

Board Members asked questions of staff.

Jorge Leon, State Board, recommended the Board move forward with a decision as to whether or not to hold the Public Hearing.

Chairwoman Ritschel ruled that the Public Hearing would be held. Ms. Stewart then proceeded with her presentation.

Other speakers included:
John Bergin – Ashby USA
Linda Mitrovich – Solution Strategies, Inc.
Peter Olah – Ashby USA

Ms. Stewart made closing comments.

Mr. Olah and Mr. Bergin made additional comments.

Jorge Leon, State Board enforcement attorney, made closing comments and recommended to the Board that they approve the order.

Mr. Olah made additional comments.

Mr. Robertus concurred with staff on the reductions in number of days and gave details of his recommendation for each allegation. He recommended imposing a fine of $434,561.

Ms. Ritschel closed the Public Hearing and moved to Board Member deliberation.

After Board Member discussion, Ms. Schneider made a motion to impose the fine of $434,561 but to allow them to pay $46,411 within 30 days and defer the remaining balance due until August 30, 2008.

Ms. George drafted revised language for Board consideration that would impose the full liability making it payable within 30 days but directed the Executive Officer to defer attempts to collect to remaining $388, 150 until after August 30, 2008.

Ms. Schneider amended her motion to include the errata recommended by Ms. George. The motion was seconded by Mr. Rayfield and approved by unanimous vote.

Item 15 – PUBLIC HEARING: Administrative Assessment of Civil Liability against North County Transit District, violations of Statewide General Construction Storm Water Permit at the Sprinter Rail Project Site, San Diego County. The Regional Board will consider whether to raise, lower, or reject assessment of $160,000 civil liability recommended in Complaint No. R9-2007-0093. If the discharger elects to waive their right to a hearing, the Regional Board will consider comments received during the public review period and decide on an order accepting payment of the proposed liability and waiver of hearing. (Tentative Order No. R9-2007-0219) *(Ben Neill)*

Mr. McCann announced that the North County Transit District waived their right to a hearing and paid the full amount of the civil liability. Staff member Ben Neill gave a brief presentation and recommended adopting the Order accepting the $160,000 payment.

Other speakers included:
Paul Cline – resident near project
Mo. Lahsaie – City of Oceanside
Peggy Strand – North County Transit District

Mr. King asked Ms. Strand why they agreed to pay the maximum fine. Ms. Strand responded.

Ms. Schneider made a motion to approve Order No. R9-2007-0219. The motion was seconded by Chairwoman Ritschel and approved with opposition by Mr. King.

Item 16 – PUBLIC HEARING: Administrative Assessment of Civil Liability against the Cities of Vista and Carlsbad, for violation of the Statewide General WDR for Sanitary Sewer Systems for the discharge of 7.3 million gallons of untreated sewage to Buena Vista Lagoon. The Regional Board will consider whether to raise, lower, or reject assessment of $1,095,000 civil liability recommended in Complaint No. R9-2007-0099. If the discharger elects to waive their right to a hearing, the Regional Board will consider comments received during the public review period and decide on an order accepting payment of the proposed liability and waiver of hearing. (Tentative Order No. R9-2007-0215) *(Eric Becker)*

This item was postponed.

Item 17 – PUBLIC HEARING: Administrative Assessment of Civil Liability against Fallbrook Public Utility District, for violation of Regional Board General WDR for Sanitary Sewer Systems for the discharge of 146,000 gallons of untreated sewage to Fallbrook Creek, San Diego County. The Regional Board will consider whether to raise, lower, or reject assessment of $29,300 civil liability recommended in Complaint No. R9-2007-0101. If the discharger elects to waive their right to a hearing, the Regional Board will consider comments received during the public review period and decide on an order accepting payment of the proposed liability and waiver of hearing. (Tentative Order No. R9-2007-0216) *(Joann Cofrancesco)*

This item was postponed.

Item 21 – *Closed Session* - Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The Regional Board may meet in closed session to consider initiating criminal prosecution against persons who are alleged to have violated the Porter-Cologne Water Quality Control or the federal Clean Water Act or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)] *(John Robertus)*

Item 22 – *Closed Session* - Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The Regional Board may meet in closed session to consider evidence received in an adjudicatory hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)]

Item 23 – *Closed Session* - Personnel
The Regional Board may meet in closed session to consider personnel matters involving exempt employees [Authorized under Government Code Section 11126(a)]

The Closed Sessions, Items 21-23, were not held,

Item 24 – Arrangements for Next Meeting and Adjournment

Wednesday, February 13, 2008 - 9:00 a.m.
Water Quality Control Board
Regional Board Meeting Room
9174 Sky Park Court
San Diego, California

With there being no further business, the meeting was adjourned at 5:45 p.m.

These minutes were prepared by:

Lori Costa
Executive Assistant

Signed by:

John H. Robertus
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE ADDENDUM NO. 1 TO ORDER NO. R9-2007-0001
NPDES PERMIT NO. CAS0108758

AN ADDENDUM EXTENDING SELECTED DUE DATES FOR ORDER NO. R9-2007-0001 AS A RESULT OF THE OCTOBER 2007 WILDFIRES IN SAN DIEGO COUNTY

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board) finds that:

1. Regional Board Order No. R9-2007-0001 (NPDES Permit No. CAS0108758), *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority*, prescribes requirements for the control of pollutant discharges from MS4s within San Diego County.

2. Order No. R9-2007-0001 requires the Copermittees to submit reports and plans on prescribed dates to ensure compliance with the directives of Order No. R9-2007-001.

3. On October 21, 2007, the Governor proclaimed a regional disaster area in the San Diego Region. As of November 13, 2007, wildfires had reportedly burned an estimated 400,000 acres, destroyed or damaged over 3,100 structures, and caused the evacuation of over 500,000 residents in San Diego County.

4. On November 13, 2007, the County of San Diego, on behalf of the San Diego Region Municipal Copermittees, provided the Regional Board with a written request for an extension of due dates for a period of up to eight weeks, for the submittal and implementation of selected deliverables, required by Order No. R9-2007-0001. The Copermittees emergency response to the wildfires has resulted in the reassignment of hundreds of staff whose expertise is needed to submit the deliverables by the prescribed due dates.

5. The Regional Board has notified all known interested parties of its intent to modify Order No. R9-2007-0001 to reflect the extension of due dates for selected required deliverables.

6. The Regional Board in a public hearing heard and considered all comments pertaining to the modification of Order No. R9-2007-0001.

IT IS HEREBY ORDERED THAT

1. Order No. R9-2007-0001 is modified as the following:

   a. Jurisdictional Urban Runoff Management Program, Section D, page 15 – "Each Copermittee shall implement all requirements of section D of this Order no later than ~~365~~ **425** days after adoption of the Order, unless otherwise specified in this Order. Prior to ~~365~~ **425** days after adoption of the Order each Copermittee shall at a minimum implement is Jurisdictional URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01."

   b. Construction Component Ordinance Update and Approval Process, Section D.2.a.(1), page 28 – "Within ~~365~~ **425** days of adoption of this Order, each Copermittee shall review and update its grading ordinances and other ordinances as necessary to achieve full compliance with this Order, including requirements for the implementation of all designated BMPs and other measures."

   c. Watershed Urban Runoff Management Program, Section E.1, page 46 – "Each Copermittee shall implement all requirements of section E of this Order no later than ~~365~~ **425** days after adoption of this Order, unless otherwise specified in this Order. Prior to ~~365~~ **425** days after adoption of this Order, each Copermittee shall collaborate with the other Copermittees within its Watershed Management Area(s) (WMA) to at a minimum implement its Watershed URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01."

   d. Regional Urban Runoff Management Program, Section F, page 50 – "The Copermittees shall implement all requirements of section F of this Order no later than ~~365~~ **425** days after adoption of this Order, unless otherwise specified in this Order."

   e. Reporting, Urban Runoff Management Plans, Jurisdictional Urban Runoff Management Plans, Section J.1.a.(2), page 58 – "Principal Permittee – The Principal Permittee shall be responsible for collecting and assembling the individual JURMPs which cover the activities conducted by each individual Copermittee. The Principal Permittee shall submit the JURMPs to the Regional Board ~~365~~ **425** days after adoption of this Order."

   f. Reporting, Urban Runoff Management Plans, Watershed Urban Runoff Management Plans, Section J.1.b.(3), page 62 – "Principal Permittee – The Principal Permittee shall assemble and submit the WURMPs to the Regional Board ~~365~~ **425** days after adoption of this Order."

g. Reporting, Urban Runoff Management Plans, Regional Urban Runoff Management Plan, Section J.1.c.(2), page 64 – "The Principal Permittee shall be responsible for creating and submitting the RURMP. The Principal Permittee shall submit the RURMP to the Regional Board ~~365~~ **425** days after adoption of this Order."

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Addendum adopted by the California Regional Water Quality Control Board, San Diego Region, on December 12, 2007.

TENTATIVE
JOHN H. ROBERTUS
Executive Officer

U.S. Environmental Protection Agency

NPDES Permit Writers' Manual

U.S. Environmental Protection Agency
Office of Wastewater Management, Water Permits Division
State and Regional Branch

EPA-833-K-10-001 • September 2010

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United States
Environmental Protection
Agency

Office of Water
Washington, DC

United States
Environmental Protection Agency

National Pollutant Discharge Elimination System (NPDES) Permit Writers' Manual

This guidance was developed by staff within the U.S. Environmental Protection Agency's (EPA's) Office of Wastewater Management and addresses development of wastewater discharge permits under the National Pollutant Discharge Elimination System (NPDES). NPDES permit development is governed by existing requirements of the Clean Water Act (CWA) and the EPA NPDES implementing regulations. CWA provisions and regulations contain legally binding requirements. This document does not substitute for those provisions or regulations. Recommendations in this guidance are not binding; the permitting authority may consider other approaches consistent with the CWA and EPA regulations. When EPA makes a permitting decision, it will make each decision on a case-by-case basis and will be guided by the applicable requirements of the CWA and implementing regulations, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the situation. This guidance incorporates, and does not modify, existing EPA policy and guidance on developing NPDES permits. EPA may change this guidance in the future.

Water Permits Division
Office of Wastewater Management
Washington, DC 20460
(4203)
www.epa.gov/npdes

EPA-833-K-10-001
September 2010

Acknowledgements

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Many individuals assisted in this effort, including the following:

EPA, Office of Water, Office of Wastewater Management, Water Permits Division, Washington, DC

- Mohammed Billah
- Pat Bradley
- Elaine Brenner
- Jennifer Chan
- Kawana Cohen
- Juhi Saxena
- Louis Eby
- Jack Faulk
- Sara Hilbrich
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- Meghan Hessenauer, Office of Science and Technology, Engineering and Analysis Division
- Carey Johnston, Office of Science and Technology, Engineering and Analysis Division
- Dick Reding, Office of Science and Technology, Engineering and Analysis Division
- Marla Smith, Office of Science and Technology, Engineering and Analysis Division

Additional EPA Contributors

- Robert Hargrove, Office of Enforcement and Compliance Assurance, Office of Federal Activities, Washington, DC
- Robert Klepp, Office of Enforcement and Compliance Assurance, Office of Civil Enforcement, Washington, DC
- Doug Corb, Region 1 New England NPDES Municipal Permit Branch, Boston, MA

Jennifer Duckworth and **Gregory Currey**, *Tetra Tech, Inc., Permits and Regulatory Support, Fairfax, VA* managed production and technical support for development of the manual.

Additional contributors from Tetra Tech, Inc. for development, design, and final production of this document include

- Krista Carlson
- Jim Collins
- Chuck Durham
- Steve Geil
- Shari Goodwin
- John Kosco
- I-Hsin Lee
- Gregory Mallon
- Betty Peterson
- Gregory Savitske
- Peter Sherman
- Kristin Schatmeyer
- Jeff Strong

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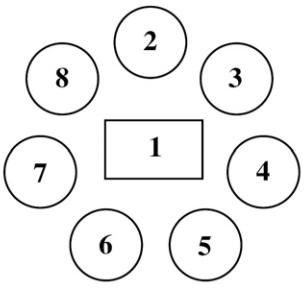
4. Concentrated Animal Feeding Operation—USDA NRCS
5. Incidental Vessel Discharges—Smithsonian Environmental Research Center, National Ballast Information Clearinghouse
6. Non-Municipal (Industrial)—EPA
7. Construction Stormwater—Barry Tonning, Tetra Tech, Inc.
8. Combined Sewer Overflow—EPA



Contents

Exhibits

Introduction to the Manual

This manual reviews the statutory and regulatory framework of the National Pollutant Discharge Elimination System (NPDES) program and examines technical considerations for developing NPDES permits for wastewater discharges. The manual is designed, primarily, for new permit writers becoming acquainted with the NPDES program and the process of permit writing, but can also serve as a reference for experienced permit writers or anyone interested in learning about the legal and technical aspects of developing NPDES permits. This manual replaces the *1996 U.S. EPA NPDES Permit Writers' Manual*[1] <www.epa.gov/npdes/pubs/owm0243.pdf>, which updated the *1993 Training Manual for NPDES Permit Writers*[2] <www.epa.gov/npdes/pubs/owm0339.pdf>.

To assist the reader, acronyms and abbreviations are defined for the first use in each chapter and in Appendix A of the manual. Endnotes are provided at the end of each chapter.

Purpose of this Manual

The purpose of this *NPDES Permit Writers' Manual* (manual) is to provide a general reference for permitting authorities that outlines and explains the core elements of the NPDES permit program. The core elements form the foundation of the NPDES program on which guidance for specific areas of the program (e.g., stormwater, concentrated animal feeding operations) can be built. While the guidance for these core program areas will be applicable in many cases, the U.S. Environmental Protection Agency (EPA) recognizes that each EPA Regional Office or authorized state, territory, or tribe (hereafter *state*) will tailor specific aspects of its NPDES permitting procedures to address state and local laws and site-specific concerns and conditions.

The specific objectives and functions of this manual are as follows:

- Provide an overview of the scope and the statutory and regulatory framework of the NPDES program.
- Describe the essential components of a permit and provide an overview of the permitting process.
- Describe the different types of effluent limitations and the legal and technical considerations involved in developing effluent limitations.
- Describe the legal and technical considerations involved in developing other permit conditions including
  - Monitoring and reporting requirements.
  - Special conditions.
  - Standard conditions.
- Describe other permitting considerations including
  - Variances.
  - Anti-backsliding.
  - Other applicable statutes.

- Explain the administrative process for issuing, modifying, revoking and terminating NPDES permits.

This manual is not intended to be a standalone reference document. Rather, it establishes the framework for NPDES permit development and should be supplemented, where necessary, by additional EPA and state regulations, policy, and detailed guidance applicable to specific types of dischargers and circumstances. To that end, this manual identifies and references relevant regulations, policy, and other guidance documents throughout the text.

Publications Referenced

This manual provides links to publications available online that supplement the information in the manual. All documents available electronically were accessed and available as of the date of this manual's publication. Some documents are not available in an electronic format. In those instances, readers should check the following sources to determine the availability of and to obtain printed copies of the documents:

- Office of Water Resource Center (OWRC) <www.epa.gov/safewater/resource/>
  OWRC is a contractor-operated facility providing document delivery, information/referral, and reference services to public users and EPA staff interested in Office of Water Program information
  phone: 202-566-1729 or 800-832-7828, fax: 202-566-1736, e-mail: <center.water-resource@epa.gov>.
- EPA Library Services and Repositories <www.epa.gov/natlibra/libraries.htm>
  EPA's library services and repositories provide access to information about the environment and related scientific, technical, management, and policy information. Library services <www.epa.gov/natlibra/library_services.html> are delivered through the National Library Network <www.epa.gov/natlibra/index.html>.
- National Service Center for Environmental Publications (NSCEP) <www.epa.gov/ncepihom/>
  NSCEP, formerly NCEPI, maintains and distributes EPA publications in hardcopy, CD ROM and other multimedia formats. The publication inventory includes more than 7,000 titles
  phone: 513-489-8190 or 800-490-9198, fax: 513-489-8695, e-mail: ncepimal@one.net.
- National Technical Information Service (NTIS) <www.ntis.gov/>
  NTIS is the largest central resource for government-funded scientific, technical, engineering, and business related information covering more than 350 subject areas from more than 200 federal agencies
  phone: 703-605-6050 or 888-584-8332, fax: 703-605-6900, e-mail: customerservice@ntis.gov.

Legislative and Regulatory Citations

There are a number of different conventions used to cite legislation and regulations. In this manual, the following conventions have been used:

- When citing the *United States Code*, the abbreviation U.S.C. is used. The abbreviation is preceded by the Title of the U.S.C. and then followed by the section number.
  Example: 16 U.S.C. 1531 *et seq*. and 33 U.S.C. §§ 1251-1387.

- When citing the Clean Water Act, the abbreviation CWA is used. The abbreviation is followed by the word *section* and then the section number.
  Example: CWA section 402 and CWA section 402(o).
- When citing the *Code of Federal Regulations* (CFR), the convention depends on the location of the reference. For first references, the abbreviation CFR is preceded by the title number of the CFR and followed either by the word *Part* (if it is a part—a whole number) or the number of the subsection (if it is a subpart/subsection). For subsequent references, the title and CFR are omitted and just the word *Part* or the section symbol (§) is used.
  Example: First citation: 40 CFR Part 136 or 40 CFR 122.44
  Subsequent citations: Part 136 or § 122.44.

Almost all the regulatory citations in this manual are for Title 40 of the CFR (with the exception of the other federal laws referenced in section 11.1 of this manual). Any other Titles are explicitly referenced and in the format for the first regulatory citation (e.g., 50 CFR Part 402).

Electronic NPDES Information

Websites and electronically stored publications and data are available to help permit writers draft NPDES permits. Tools have been created to assist permit writers with specific aspects of permit development and are discussed in their respective sections. The electronic tools listed below apply to all aspects of permit development and serve as valuable references for the permit writer.

NPDES Website and Resources

The Water Permits Division (WPD) within the EPA Office of Water (OW), Office of Wastewater Management, has developed a comprehensive NPDES Website <www.epa.gov/npdes> with technical and regulatory information about the NPDES permit program, information on related programs and initiatives, and documents published by WPD. Where applicable, this manual references the NPDES Website and provides links to relevant documents on that site. This manual also references other EPA and non-EPA websites that contain information that might be helpful to NPDES permit writers. Note, however, that EPA is not responsible for information provided on websites outside the EPA Website <www.epa.gov>.

WPD also has prepared several websites and other resources to help permit writers draft permits. This manual references those websites and resources in the appropriate section of this manual.

Electronic Permitting Tools

Many EPA Regions and authorized states have developed tools to help them manage the permit issuance process. Electronic permitting tools range from spreadsheets and word processing applications to sophisticated Web-based systems that enable permitting authorities to manage their entire environmental program. For example, some states have built systems that enable dischargers to electronically sign and submit discharge reports; create, track, and store permit documents; and manage enforcement, compliance, and inspections related to permits. As technologies continue to evolve, many permitting authorities are likely to begin using more information technology applications to manage the process of permitting.

ICIS-NPDES

Together with OW, the Office of Enforcement and Compliance Assurance (OECA) is responsible for oversight of implementation of the NPDES program. OW is responsible for the NPDES implementing regulations and oversight of permit issuance by states and EPA Regions. OECA, along with its regional, state, tribal and local counterparts, is responsible for tracking and maintaining enforcement and compliance activities, monitoring and enforcement and compliance status of the regulated community, and reviewing and evaluating program performance. OECA also maintains national data systems to support program management and oversight of the NPDES program.

The Permit Compliance System (PCS), one of two national NPDES electronic databases, supports the management and oversight of the NPDES program. Since the last modernization of PCS in 1985, the NPDES program has evolved significantly to include additional program requirements, such as the NPDES program for stormwater and implementation of the Combined Sewer Overflow Control Policy. Because of limitations to PCS, OECA is working to phase out this system and move to a more modern data management system described below.

The Integrated Compliance Information System for NPDES permits (ICIS-NPDES) <https://icis.epa.gov/icis>, the successor to PCS, provides an updated system that enables national program management and oversight activities such as

- Permit tracking and management.
- Compliance monitoring.
- NPDES program management.
- Enforcement actions.

ICIS-NPDES is a Web-based system with an electronic database capable of handling the large amount of data generated by and about the NPDES program. Section 11.5.1.1 of this manual provides more information on ICIS-NPDES as it relates to NPDES permit compliance.

Hyperlinks in this Document

Where a website provides supplementary information or is referenced in this manual, the actual site or higher level site address appears in the symbols < > so that readers will have a reference to the address even in a printed version of this document. In the electronic version of the manual, the text in carats is also the hyperlink to the referenced website. Care has been taken to provide the correct Web addresses and hyperlinks; however, these references can change or become outdated after this manual's publication.

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[1] U.S. Environmental Protection Agency. 1996. *U.S. EPA NPDES Permit Writers' Manual*. EPA-833-B-96-003. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0243.pdf>. Separate sections of this document are also available on the NPDES Website by going to <www.epa.gov/npdes>, clicking on Publications and entering NPDES Permit Writers' Manual in the Search box.

[2] U.S. Environmental Protection Agency. 1993. *Training Manual for NPDES Permit Writers*. EPA-833-B-93-003. U.S. Environmental Protection Agency, Office of Wastewater Management, Washington, DC. <www.epa.gov/npdes/pubs/owm0339.pdf>.

CHAPTER 1. Development of the Clean Water Act and the NPDES Program

This chapter presents an overview of the history of water pollution control in the United States and the evolution and accomplishments of the National Pollutant Discharge Elimination System (NPDES) Program.

1.1 History of Water Pollution Control in the United States

Major water pollution control legislation in the United States dates back to the end of the 19th century. Exhibit 1-1 presents a summary of key legislative and executive actions in the history of clean water program development in the United States.

Exhibit 1-1 Important milestones of clean water program development

1899 Rivers and Harbors Act
1948 Federal Water Pollution Control Act (FWPCA)
1965 Water Quality Act
1970 Executive Order–U.S. Environmental Protection Agency (EPA) established
1970 Refuse Act Permit Program (RAPP)
1972 FWPCA Amendments
1977 Clean Water Act (CWA)
1987 Water Quality Act (WQA)

The first major water pollution control statute was the **1899 Rivers and Harbors Act**, which established permit requirements to prevent unauthorized obstruction or alteration of any navigable water of the United States. That act focused on navigation rather than water quality.

The **1948 Federal Water Pollution Control Act (FWPCA)** initiated the federal government's involvement in water pollution control for public health protection. The act allotted funds to state and local governments for water pollution control and emphasized the states' role in controlling and protecting water resources with few federal limitations or guidelines. The act, however, did charge the U.S. Surgeon General with developing comprehensive programs to eliminate or reduce the pollution of interstate waters.

Over the next two decades, Congress became increasingly interested in the problem of water quality degradation. From 1956 through 1966, it enacted four major laws to strengthen the federal role in water pollution control, including the FWPCA Amendments of 1956 and the FWPCA Amendments of 1961. Those statutes focused primarily on providing funding to municipalities to construct wastewater treatment plants.

Just a few years later, Congress further strengthened federal water pollution control laws by enacting the **1965 Water Quality Act**. This law created the Federal Water Pollution Control Administration and

represented a major regulatory advancement in water pollution control by requiring states to develop water quality standards for interstate waters by 1967. The Water Quality Act also called for states to quantify the amount of pollutants that each discharger could release without exceeding the water quality standards (i.e., pollutant loadings). Despite escalating public concern and increased public spending, only about half of the states developed water quality standards by 1971. Furthermore, enforcement of the federal statute was minimal because the regulatory agencies had to demonstrate a direct link between a discharge and a health or water quality problem, and the scientific data to make such demonstrations were often lacking. Finally, there were no criminal or civil penalties for violations of statutory requirements.

Growing concern about the environment prompted President Nixon to form the **U.S. Environmental Protection Agency (EPA**) in 1970 to enforce environmental compliance and consolidate federal pollution control activities. That year, the President also created the **Refuse Act Permit Program (RAPP)** through Executive Order 11574 and under the authority of section 13 of the 1899 Rivers and Harbors Act (a section also known as the Refuse Act). This new permitting program was focused on controlling industrial water pollution. EPA and the U.S. Army Corps of Engineers (Corps) would prepare the program requirements and the Corps would administer the program. EPA was tasked with developing *guidelines on effluent quality* for 22 different categories of sources. A discharger would apply for a permit, and the Corps would ask EPA if the proposed effluent levels were consonant with state water quality standards and with the newly developed guidelines on effluent quality. States would be asked to examine permit applications and advise EPA whether existing or proposed treatment processes would ensure that established water quality standards would be met. EPA would review the state's response for interstate waters and instruct the Corps whether to issue the permit. However, the U.S. District Court for the District of Columbia struck down RAPP (*Kalur v. Resor*, Civ. Action No. 1331-71 [D.D.C. Dec. 21, 1971]) because the program would allow the issuance of permits to discharge refuse to non-navigable tributaries of navigable waterways, which the Court said exceeded the authority given in the Act, and because the regulations implementing the program did not require compliance with certain procedural requirements of the National Environmental Policy Act.

Because of the perceived need for a discharge permit program, and to rectify the problems encountered in earlier water pollution control legislation, Congress enacted the **FWPCA Amendments of 1972**. This legislation, which was passed over a Presidential veto in November 1972, provided a comprehensive re-codification and revision of past federal water pollution control law. The 1972 amendments marked a distinct change in the philosophy of water pollution control in the United States and marked the beginning of the present water programs, including the NPDES permit program. Under those amendments, the federal government assumed a major role in directing and defining water pollution control programs. In establishing the basis for clean water programs, Congress sought a balance between economics (considering both the costs and benefits of cleanup) and ecology (setting deadlines and ambitious requirements for reducing discharges and restoring water quality).

The FWPCA Amendments of 1972 established a series of goals in section 101. Perhaps the most notable goal was that the discharge of pollutants into navigable waters be eliminated by 1985. Although that goal remains unmet, it underlies the CWA approach to establishing the technology standards that are implemented through technology-based effluent limitations (TBELs) in NPDES permits. The FWPCA Amendments of 1972 also set an interim goal of achieving, "water quality [that] provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water" by July 1, 1983. That goal is commonly referred to as the *fishable, swimmable* goal of the act and is one

of the factors that states must consider in the development of their water quality standards. The water quality standards are implemented in NPDES permits through water quality-based effluent limitations (WQBELs). By prohibiting the discharge of a pollutant or pollutants from a point source to waters of the United States—except as in compliance with the statute, the FWPCA Amendments of 1972 also established the important principle that the discharge of pollutants to navigable waters is not a right.

Since 1972, the FWPCA has been further amended on several occasions, including the **1977 Clean Water Act** (CWA), which is now the name for the statute, and the **1987 Water Quality Act** (WQA). Both of these statutes are discussed further in section 1.2 below with regard to their impact on the evolution of the NPDES program. Exhibit B-1, Index to Sections of the CWA, in Appendix B of this document matches the key sections of the CWA to their appropriate reference in the *United States Code* (U.S.C.). This information is at U.S.C., Title 33 (Navigation and Navigable Waters), Chapter 26 (Water Pollution Prevention and Control), 1251-1387 (33 U.S.C. §§ 1251-1387) <www.epa.gov/lawsregs/laws/cwa.html>.

1.2 Evolution of the NPDES Program

Section 402 of Title IV of the FWPCA, Permits and Licenses, created today's system for permitting wastewater discharges, known as the NPDES program. Under the requirements of the program, a point source may be authorized to discharge pollutants into waters of the United States by obtaining a permit. Section 1.3 below discusses this basic statutory framework in detail. A permit provides two types of control: technology-based limitations (based on the technological and economic ability of dischargers in the same category to control the discharge of pollutants in wastewater) and water quality-based limitations (to protect the quality of the specific waterbody receiving the discharge).

The FWPCA Amendments of 1972 established several important requirements and deadlines. Municipal facilities were required to meet secondary treatment standards by July 1, 1977. Industrial facilities were required to meet two levels of technology standards: *Best Practicable Control Technology Currently Available* (BPT) and *Best Available Technology Economically Achievable* (BAT), which would bring them further toward the goal of eliminating the discharge of all pollutants. [CWA section 301 (b)(2)(A)]. Compliance deadlines for BPT and BAT were established as of July 1, 1977, and July 1, 1983, respectively.

In addition to BPT and BAT requirements for industrial categories, the 1972 FWPCA Amendments established *new source performance standards* (NSPS) or best available demonstrated control technology including where practicable a standard permitting no discharge of pollutants [CWA section 306(a)]. The Legislative History indicates that Congress believed that technologies would be more affordable for new dischargers who could plan control technologies at the design phase. The standards represent state-of-the-art control technologies for new sources because the permittees have the opportunity to install the most efficient production processes and the latest in treatment technologies during construction. NSPS are effective on the date the facility begins operation, and the facility must demonstrate compliance within 90 days of start-up.

EPA tried to set national, uniform effluent limitations guidelines and standards (effluent guidelines) as a basis for technology-based limitations; however, most effluent guidelines were not in place when the first set of permits was issued between 1973 and 1976. About 75 percent of the first round permits were issued

under a section of the act that allows a permit writer to use his or her best professional judgment to establish case-by-case limitations. Using that approach, a single permit writer developed effluent limitations for a specific facility using his or her knowledge of the industry and the specific discharge, rather than using a set of national standards and limitations developed by EPA for the entire industry.

This first round of permitting focused on *conventional pollutants*, which generally are found in sanitary waste from households, businesses, and industries. CWA section 304(a)(4) and Title 40 of the *Code of Federal Regulations* (CFR) 401.16 designate the conventional pollutants with oil and grease added to § 401.16 in 1979. The following are formally designated as conventional pollutants:

- Five-day Biochemical Oxygen Demand (BOD_5).
- Total Suspended Solids (TSS).
- pH.
- Fecal Coliform.
- Oil and Grease.

The 1972 FWPCA Amendments, however, also required that EPA publish a list of toxic pollutants within 90 days and propose effluent standards for those pollutants 6 months later. EPA was not able to meet those requirements because of the lack of information on treatability. The Natural Resources Defense Council (NRDC) sued EPA, resulting in a court supervised *consent decree* (*NRDC et al. v. Train, 8 E.R.C. 2120*, DDC 1976) that identified the following:

- Toxic (priority) pollutants to be controlled.
- Primary industries for technology-based control.
- Methods for regulating toxic discharges through the authorities of the FWPCA Amendments.

The provisions of the consent decree were incorporated into the framework of the 1977 FWPCA Amendments, formally known as the CWA. This statute shifted the emphasis of the NPDES program from controlling conventional pollutants to controlling toxic pollutant discharges. CWA section 307(a)(1) required EPA to publish a list of toxic pollutants or combination of pollutants. Those pollutants often are called the priority pollutants and are listed in § 401.15. The terms *toxic pollutant* and *priority pollutant* are used interchangeably throughout this document.

CWA section 307(a) originally identified 65 toxic pollutants and classes of pollutants for 21 major categories of industries (known as *primary industries*). That list was later further defined as the current list of 126 toxic pollutants. The priority pollutants are listed in Appendix C of this document and in Appendix A of Part 423. Note that the list goes up to 129; however, there are only 126 priority pollutants because 017, 049, and 050 were deleted.

The 1977 CWA adjusted technology standards to reflect the shift toward control of toxics, clarified and expanded the concept of BAT controls, created a new level of control for conventional pollutants, and made changes to strengthen the industrial pretreatment program. The 1977 law created a new pollutant category, nonconventional pollutants, that included pollutants (such as chlorine and ammonia) not specifically categorized as conventional or toxic. The CWA clarified that BAT covers both toxic and nonconventional pollutants, extended the compliance deadline for BAT for toxic pollutants to July 1, 1984, established a three-year deadline for compliance with BAT for newly listed toxics, and gave industries until as late as July 1, 1987 to meet BAT requirements for nonconventional pollutants. In addition, conventional pollutants, controlled by BPT and BAT in the first round of permitting, were now

subject to a new level of control termed *Best Conventional Pollutant Control Technology* (BCT). The CWA established a compliance deadline for BCT of July 1, 1984. BCT was not an additional performance standard, but replaced BAT for the control of conventional pollutants. Finally, among other changes, the 1977 CWA authorized EPA to approve local pretreatment programs and required authorized states to modify their programs to provide for local pretreatment program oversight.

The 1977 CWA recognized that the technology-based limitations were not able to prevent the discharge of toxic substances in toxic amounts in all waterways. To complement its work on technology-based limitations, EPA initiated a national policy in February 1984 to control toxics using a water quality approach. On February 4, 1987, Congress amended the CWA with the 1987 WQA that outlined a strategy to accomplish the goal of meeting state water quality standards. The 1987 WQA required all states to identify waters that were not expected to meet water quality standards after technology-based controls on point source were imposed. Each state then had to prepare individual control strategies to reduce toxics from point and nonpoint sources to meet the water quality standards. Among other measures, those plans were expected to address control of pollutants beyond technology-based levels.

The 1987 WQA further extended the compliance deadline for BAT- and BCT-based effluent limitations, this time to a new deadline of March 31, 1989. The 1987 WQA also established new schedules for issuing NPDES permits to industrial and municipal stormwater dischargers. In addition to meeting water quality-based standards, industrial stormwater discharges must meet the equivalent of BAT and BCT effluent quality standards. *Municipal separate storm sewer systems* (MS4s) were required to have controls to reduce pollutant discharges to the *maximum extent practicable* (MEP), including management practices, control techniques and system design and engineering methods, and such other provisions as the Administrator deems appropriate for the control of such pollutants [CWA section 402(p)(3)(B)]. The 1987 WQA also required EPA to identify toxics in sewage sludge and establish numeric limitations to control such toxics. A statutory *anti-backsliding* requirement in the WQA specified the circumstances under which an existing permit can be modified or reissued with less stringent effluent limitations, standards, or conditions than those already imposed.

Since 1987, there have been minor revisions to the CWA (e.g., Combined Sewer Overflow program requirements). However, the basic structure of the NPDES program remains unchanged from the framework established in the 1972 FWPCA Amendments.

1.3 NPDES Statutory Framework

As noted in section 1.2 above, under the NPDES program any point source that discharges or proposes to discharge pollutants into waters of the United States is required to obtain an NPDES permit. Understanding how each of these terms (i.e., permit, pollutant, waters of the United States, and point source) is defined is the key to defining the scope of the NPDES program.

1.3.1 Permit

A permit is a license, issued by the government to a person or persons granting permission to do something that would otherwise be illegal without the permit. An NPDES permit typically is a license for a facility to discharge a specified amount of a pollutant into a receiving water under certain conditions; however, NPDES permits can also authorize facilities to process, incinerate, landfill, or beneficially use

biosolids (sewage sludge). A discharger does not have a right to receive a permit, and permits may be revoked for cause such as noncompliance with the conditions of the permit.

1.3.2 Pollutant

The term *pollutant* is defined in CWA section 502(6) and § 122.2. The statute defines pollutant very broadly and includes any type of industrial, municipal, or agricultural waste (including heat) discharged into water. For regulatory purposes, pollutants are grouped into three categories under the NPDES program: conventional, toxic, and nonconventional.

- **Conventional** pollutants are those defined in CWA section 304(a)(4) and § 401.16 (BOD_5, TSS, fecal coliform, pH, and oil and grease).
- **Toxic (priority)** pollutants are those defined in CWA section 307(a)(1) (and listed in § 401.15 and Appendix A of Part 423) and include 126 metals and manmade organic compounds (see Exhibit C-1 in Appendix C of this document).
- **Nonconventional** pollutants are those that do not fall under either of the above categories (conventional or toxic pollutants) and include parameters such as chlorine, ammonia, nitrogen, phosphorus, chemical oxygen demand (COD), and whole effluent toxicity (WET).

Sewage from vessels and, under certain conditions, water, gas, or other material injected into wells to facilitate production of oil or gas or water derived in association with oil and gas production and disposed of in a well are specifically excluded from the definition of pollutant under the NPDES program.

1.3.3 Waters of the United States

The CWA regulates discharges to *navigable waters*. CWA section 502(7) defines navigable waters as "waters of the United States, including the territorial seas." NPDES regulations define *waters of the United States* to mean,

- Waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters subject to the ebb and flow of the tide.
- Interstate waters including interstate *wetlands*.
- Other waters that could affect interstate or foreign commerce.
- Impoundments of waters of the United States.
- Tributaries of the above categories of waters.
- Territorial seas.
- Wetlands adjacent to other waters (except wetlands themselves) in the above categories.

Wetlands are further defined in § 122.2. In addition, the definition of waters of the United States contains exclusions for waste treatment systems (other than certain cooling ponds) designed to meet the requirements of the CWA and also for *prior converted croplands*, which is mostly relevant to the CWA section 404 permitting program administered by the Corps.

Waters of the United States covers a broad range of surface waters. The CWA does not give EPA the authority to regulate ground water quality through NPDES permits. If a discharge of pollutants to ground water reaches waters of the United States, however, it could be a discharge to the surface water (albeit indirectly via a direct hydrological connection, i.e., the ground water) that needs an NPDES permit.

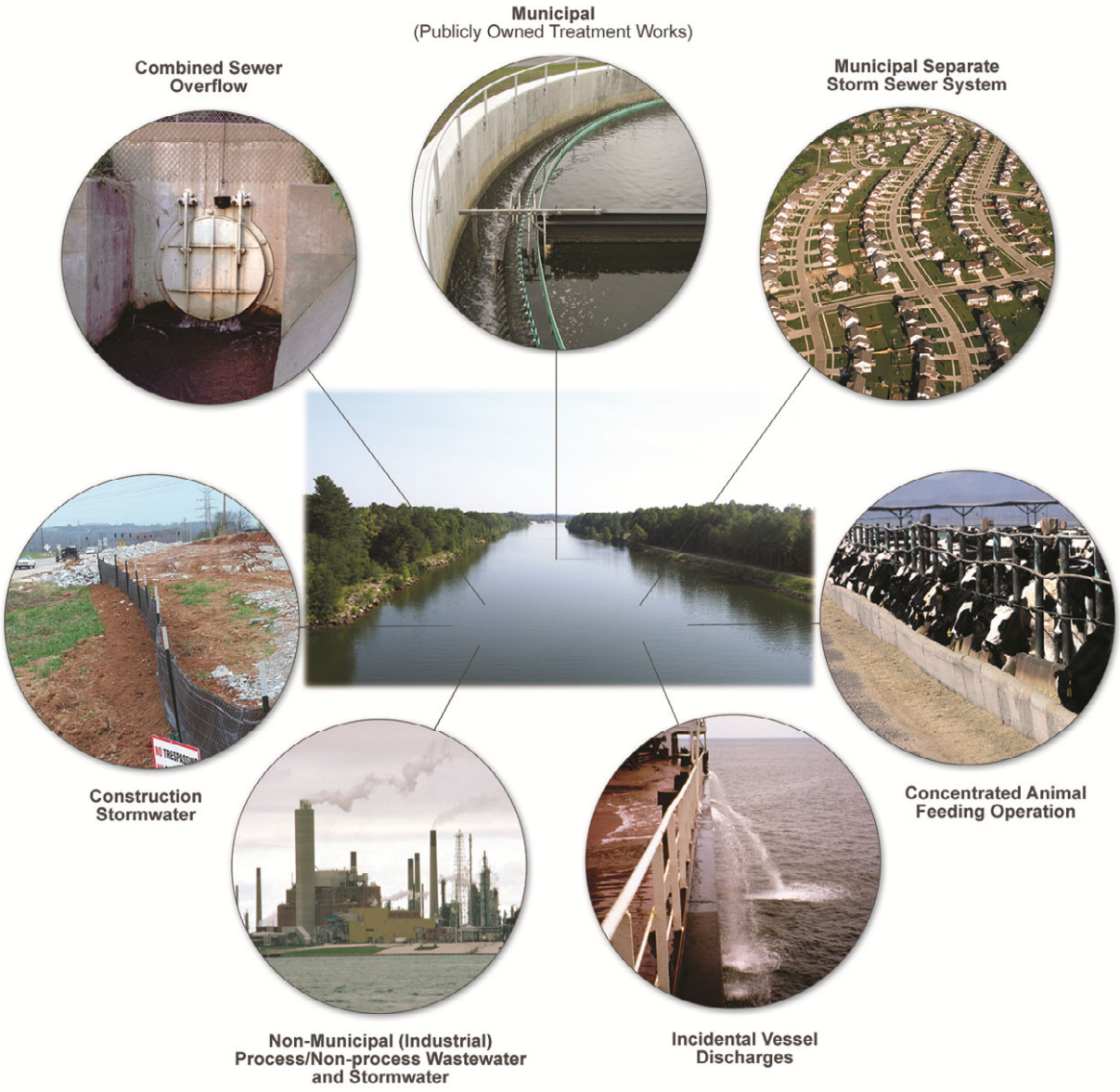
The scope of waters of the United States has been the subject of several U.S. Supreme Court cases (the most recent as of the time of publication of this manual being a decision from 2006 in the combined Rapanos/Carabell wetland cases) and numerous lower court cases. The court cases often have been difficult to interpret, resulting in much litigation and an evolving understanding of the exact scope of waters subject to CWA jurisdiction. Also, permit writers should keep in mind that discharges through non-jurisdictional features that reach waters of the United States may need a permit even if the discharge is not directly to a jurisdictional waterbody. EPA Regional wetlands staff have significant expertise in jurisdictional issues related to the scope of waters of the United States. Some Regions have interoffice teams to address jurisdictional issues that come up in the different CWA programs. In addition, guidance on waters of the United States is on EPA's Office of Wetlands, Oceans, and Watersheds Website <www.epa.gov/wetlands/guidance/CWAwaters.html>.

1.3.4 Point Source

Pollutants can enter water via a variety of pathways including agricultural, domestic and industrial sources. For regulatory purposes, these sources generally are categorized as either point sources or nonpoint sources. The term *point source* is defined in CWA section 502(14) and § 122.2 to include any discernible, confined, and discrete conveyance from which pollutants are or may be discharged. Point source discharges include discharges from publicly owned treatment works (POTWs), industrial process wastewater discharges, runoff conveyed through a storm sewer system, and discharges from concentrated animal feeding operations (CAFOs), among others (see Exhibit 1-2). Return flows from irrigated agriculture and agricultural stormwater runoff specifically are excluded from the definition of a point source.

Pollutant contributions to waters of the United States may come from both direct and indirect discharges. Direct discharge (which is synonymous with *discharge of a pollutant*) is defined by the NPDES regulations at § 122.2 to include any addition of any pollutant or combination of pollutants to a water of the United States from any point source. An *indirect discharger* is defined as, "a nondomestic discharger introducing pollutants to a POTW." Under the national program, NPDES permits are issued only to direct dischargers. The National Pretreatment Program controls industrial and commercial indirect dischargers (for more on pretreatment, see section 2.3.1.2 of this manual).

Exhibit 1-2 Common point source discharges of pollutants to waters of the United States



CHAPTER 2. Regulatory Framework and Program Areas of the NPDES Program

This chapter discusses the regulatory framework of the National Pollutant Discharge Elimination System (NPDES) program, identifies the types of activities regulated under the NPDES program, describes the roles and responsibilities of federal and state governments, and presents the program areas that address the various types of regulated activities.

2.1 Regulatory Framework of the NPDES Program

Chapter 1 discussed how Congress, in Clean Water Act (CWA) section 402, required the U.S. Environmental Protection Agency (EPA) to develop and implement the NPDES permit program. While Congress' intent was established in the CWA, EPA was required to develop specific regulations to carry out the congressional mandate. The regulations developed by EPA to implement and administer the NPDES program primarily are in Title 40 of the *Code of Federal Regulations* (CFR) Part 122 <www.epa.gov/lawsregs/search/40cfr.html>.

The CFR is an annual codification of the general and permanent rules published in the *Federal Register* (FR) by the executive departments and agencies of the federal government. The CFR is divided into 50 titles that represent broad areas subject to federal regulation. Title 40 covers protection of the environment. The FR is a legal publication that contains federal agency regulations; proposed rules and notices; and executive orders, proclamations and other presidential documents. The National Archives and Records Administration, an independent federal agency responsible for managing all federal records, publishes the FR and CFR. The text of all final regulations is found in the CFR. The background and implementation information related to these regulations, however, are found in the preamble to the regulations contained in the FR. This information is important to permit writers because it explains the legal, technical, and scientific bases on which regulatory decisions are made.

Exhibit 2-1 lists regulations in 40 CFR that are related to the NPDES program, and Exhibit 2-2 is an outline of the federal NPDES regulations from Part 122. The regulations at § 123.25 should be referenced for information applicable to state NPDES programs. Exhibit B-2 in Appendix B of this document is an Index to NPDES Regulations that provides regulatory citations by topic area.

Exhibit 2-1 Regulations related to the NPDES program

Regulation (40 CFR)	Subject
Part 121	State certification
Part 122	The federal NPDES permit program
Part 123	State program requirements
Part 124	Procedures for decision making
Part 125	Technology standards
Part 129	Toxic pollutant effluent standards
Part 130	Water quality planning and management
Part 131	Water quality standards
Part 133	Secondary treatment regulations
Part 135	Citizen suits
Part 136	Analytical procedures
Part 257	State sludge disposal regulations
Part 401	General provisions for effluent limitations guidelines and standards (effluent guidelines)
Part 403	General pretreatment regulations
Parts 405-471	Effluent guidelines
Part 501	State sewage sludge management program requirements
Part 503	Standards for use or disposal of sewage sludge

2.2 Federal and State Responsibilities

This section discusses the relationship between federal and state governments in the administration of the NPDES program and the process by which a state can become *authorized*.

2.2.1 State NPDES Program Authority

EPA may authorize qualified state, territorial, or tribal government agencies to implement all or parts of the NPDES program. States, territories, or tribes (hereafter *states*) are authorized through a process defined by the CWA section 402(b) and NPDES regulations Part 123. A state wanting to be authorized to administer the NPDES program submits to EPA a letter from the governor requesting review and approval of its program submission, a Memorandum of Agreement (MOA), a Program Description, a Statement of Legal Authority (also known as an *Attorney General's Statement* or *AG Statement*), and the underlying state laws and regulations. EPA determines whether the package is complete within 30 days of receipt. Within 90 days of receipt, EPA renders a decision to approve or disapprove the program. The time for review can be extended by agreement. The process of authorization includes a public review and comment period, and a public hearing.

States may apply for the authority to issue one or more of the following five types of NPDES authorization:

- NPDES Base Program for individual municipal and industrial facilities.
- General Permit Program.
- Pretreatment Program.
- Federal Facilities Program.
- Biosolids (Sewage Sludge) Program.

Exhibit 2-2 Federal NPDES regulations (40 CFR Part 122)

Subpart A–Definitions and General Program Requirements

§ 122.1 Purpose and scope
§ 122.2 Definitions
§ 122.3 Exclusions
§ 122.4 Prohibitions
§ 122.5 Effect of a permit
§ 122.6 Continuation of expiring permits
§ 122.7 Confidentiality of information

Subpart B–Permit Application and Special NPDES Program Requirements

§ 122.21 Applications
§ 122.22 Signatories to permit applications and reports
§ 122.23 Concentrated animal feeding operations
§ 122.24 Concentrated aquatic animal production
§ 122.25 Aquaculture projects
§ 122.26 Stormwater discharges
§ 122.27 Silviculture activities
§ 122.28 General permits
§ 122.29 New sources and new dischargers
§ 122.30-122.37 MS4s

Subpart C–Permit Conditions

§ 122.41 Standard conditions applicable to all permits
§ 122.42 Standard conditions applicable to specified categories of permits
§ 122.43 Establishing permit conditions
§ 122.44 Establishing limitations, standards, and other permit conditions

(a) Technology basis
(b) Other basis (not WQ)
(c) Reopeners
(d) Water quality basis
(e) Toxic (priority) pollutants
(f) Notification levels
(g) 24 Hour reporting
(h) Duration of permits
(i) Monitoring
(j) Pretreatment program
(k) Best management practices (BMPs)
(l) Anti-backsliding
(m) Privately owned treatment works
(n) Grants
(o) Sewage sludge
(p) Coast Guard
(q) Navigation
(r) Great Lakes
(s) Qualifying programs

§ 122.45 Calculating limitations

(a) Outfalls and discharge points
(b) Production basis
(c) Metals
(d) Continuous discharges
(e) Non-continuous discharges
(f) Mass limitations
(g) Pollutants in intake water
(h) Internal waste streams
(i) Discharge into wells, into publicly owned treatment works or by land application

§ 122.46 Duration of permits
§ 122.47 Schedules of compliance
§ 122.48 Requirements for recording and reporting of monitoring results
§ 122.49 Consideration under federal law
§ 122.50 Disposal into wells, into publicly owned treatment works or by land application

Subpart D–Transfer, Modification, Revocation and Reissuance, and Termination of Permit

§ 122.61 Transfer of permits
§ 122.62 Modification or revocation and reissuance of permits
§ 122.63 Minor modifications of permits
§ 122.64 Termination of permits

A state can receive authorization for one or more of the NPDES program components. For example, a state might receive authorization for the NPDES Base Program, General Permit Program, and Pretreatment Program, but not the Federal Facilities Program or Biosolids Program. In such a case, EPA continues to issue permits to federal facilities (e.g., facilities on military installations, federal lands) for discharges originating within the state and continues to implement the Biosolids Program. (Section 2.2.2 below provides additional discussion of Biosolids Program implementation.)

If EPA approves a program, the state assumes permitting authority in lieu of EPA. All new permit applications would then be submitted to the state agency for NPDES permit issuance. Certain permits issued before authorization might continue under EPA administration as set forth in the MOA. Even after a state receives NPDES authorization, EPA continues to issue NPDES permits on tribal lands within the boundaries of the state (if the tribe is not administering its own approved NPDES program). Following authorization, EPA also continues its national program management responsibilities by ensuring that state programs meet applicable federal requirements. If EPA disapproves the program, EPA remains the permitting authority for that state.

The State Program Status Website <www.epa.gov/npdes/authorization> provides the current authorization status for the states.

2.2.2 Roles and Responsibilities of the Federal and State Authorities

Until a state program is authorized, EPA is the permitting authority that issues all permits, conducts all compliance and monitoring activities, and enforces all program requirements.

As noted above, if a state has only partial authority, EPA will implement the other program activities. For example, where a state has an approved NPDES program but has not received EPA approval of its state sewage sludge management program, the EPA Region is responsible for including conditions to implement the Part 503 Standards for the Use or Disposal of Sewage Sludge in permits issued to treatment works treating domestic sewage (TWTDS) in that state. EPA could issue a separate permit with the applicable sewage sludge standards and requirements, or collaborate with the state on joint issuance of NPDES permits containing the Part 503 sewage sludge standards. The same process also applies where a state has not received approval of its pretreatment program or federal facilities program. One exception to that process is where an NPDES-authorized state is not approved to implement the general permit program. In such cases, EPA may not issue a general permit in that state as clarified in the memorandum *EPA's Authority to Issue NPDES General Permits in Approved NPDES States*[1] <www.epa.gov/npdes/pubs/owm0444.pdf>.

Once a state is authorized to issue permits, EPA generally is precluded from issuing permits in the state; however, EPA must be provided with an opportunity to review certain permits and may formally object to elements that conflict with federal requirements. If the permitting agency does not satisfactorily address the points of objection, EPA will issue the permit directly. Once a permit is issued through a government agency, it is enforceable by the approved state and federal agencies (including EPA) with legal authority to implement and enforce the permit. Private citizens may also bring a civil action in federal court against an alleged violator or against the EPA Administrator for alleged failure to enforce NPDES permit requirements. Exhibit 2-3 presents a summary of federal and state roles before and after program authorization.

Exhibit 2-3 Summary of federal and state/territorial/tribal roles in the NPDES permitting program

Before state/territorial/tribal program approval:

- EPA issues permits
- EPA conducts compliance and monitoring activities
- EPA enforces
- State/territory/tribe reviews permits and grants CWA section 401 certification

After state/territorial/tribal program approval:

- State/territory/tribe issues permits
- State/territory/tribe conducts compliance and monitoring activities
- State/territory/tribe enforces
- EPA provides administrative, technical and legal support
- EPA ensures state program meets federal requirements
- EPA offers NPDES program training
- EPA oversees grants to states (e.g., CWA section 106)
- EPA reviews permits and, as necessary, comments or objects
- EPA oversees and, as necessary, assumes enforcement of permits

2.3 NPDES Program Areas

NPDES permittees can be broadly classified as municipal (publicly owned treatment works [POTWs] and related discharges) and non-municipal facilities. Federal facilities fall into the broader category of non-municipal facilities. Within those broad categories, there might also be specific types of activities that are subject to unique programmatic requirements in the NPDES regulations. Exhibit 2-4 provides an overview of the different activities related to municipal and non-municipal sources; identifies the NPDES program areas that address these activities; and identifies the applicable regulations for each NPDES program area.

2.3.1 NPDES Program Areas Applicable to Municipal Sources

The NPDES regulations establish technology-based effluent requirements applicable to discharges from POTWs. In addition to effluent requirements, the NPDES regulations establish other programmatic requirements applicable to other POTW activities (e.g., sewage sludge disposal and management, stormwater discharges from the treatment plant site) or activities that may be conducted by a municipality (e.g., municipal separate storm sewer systems, combined sewer overflows). A description of those programs and how they relate to NPDES permits is provided in the following sections.

2.3.1.1 Publicly Owned Treatment Works (POTWs)

The federal regulations at § 403.3 define a POTW as a treatment works (as defined in CWA section 212) that is owned by a state or municipality [as defined in CWA section 502(4)]. The definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW. Finally, the term also means the municipality that has the jurisdiction over the indirect discharges to and the discharges from the treatment works. Federally owned treatment works, privately owned treatment works, and other treatment plants not owned by a state or municipality are not considered POTWs.

Exhibit 2-4 NPDES program areas and applicable regulations

Source	Program areas	Applicable regulations (40 CFR)
Municipal	Municipal (POTWs) effluent discharges	Part 122 Part 125 Part 133
	Indirect non-municipal discharges (Pretreatment)	Part 122 Part 403 Parts 405-471
	Biosolids (sewage sludge) use and disposal	Part 122 Part 257 Part 501 Part 503
	Combined sewer overflow (CSO) discharges	Part 122 Part 125
	Sanitary sewer overflow (SSO) discharges	Part 122
	Municipal separate storm sewer systems (MS4s) discharges	Part 122 Part 125
Non-municipal (Industrial)	Process wastewater discharges	Part 122 Part 125 Parts 405-471
	Non-process wastewater discharges	Part 122 Part 125
	Stormwater discharges associated with industrial activity	Part 122 Part 125
	Stormwater discharges from construction activities*	Part 122 Part 125
	Cooling water intake structures (CWIS)	Part 122 Part 125 Part 401
	Concentrated animal feeding operations (CAFOs)	Part 122 Part 123 Part 125 Part 412
	Concentrated aquatic animal production (CAAP) facilities	Part 122 Part 125 Part 451
	Vessel Discharges	Part 122

* Though stormwater discharges from construction activity resulting in disturbance of 5 or more acres of total land area technically are considered, "stormwater discharges associated with industrial activity" as defined by §122.26(b)(14)(x), these discharges are commonly referred to as stormwater discharges from *large* construction activities.

POTWs receive, primarily, domestic sewage from residential and commercial customers. Larger POTWs also typically receive and treat wastewater from industrial facilities (indirect dischargers) connected to the collection system. The types of pollutants treated by a POTW always include conventional pollutants and may include nonconventional and toxic pollutants, depending on the characteristics of the sources discharging to the POTW. The treatment provided by a POTW typically produces a treated effluent and a biosolids (sewage sludge) residual.

2.3.1.2 The National Pretreatment Program

The National Pretreatment Program <www.epa.gov/npdes/pretreatment> regulates the introduction of nondomestic (i.e., industrial and commercial) wastewater to POTWs. Because such discharges are treated by the POTW before release to a water of the United States, they are termed *indirect discharges*. The

pretreatment program prohibits industrial and commercial indirect dischargers from discharging pollutants to a POTW that will pass through the POTW to receiving waters or interfering with POTW treatment processes or contaminating sewage sludge. The federal program also requires certain indirect dischargers to meet technology-based requirements developed specifically for such POTW users that are similar to those for direct dischargers.

EPA's pretreatment regulations require certain POTWs to develop a pretreatment program, the requirements of which are generally included as conditions of a POTW's NPDES permit. The federal regulations specifying which POTWs must have pretreatment programs, and the authorities and procedures that must be developed by the POTW before program approval, are in Part 403. The requirement to develop and implement a local pretreatment program typically is included as a special condition in the POTW's NPDES permit. Section 9.2.1 of this manual includes a discussion on incorporating pretreatment special conditions into permits.

2.3.1.3 Biosolids (Sewage Sludge)

In 1987 Congress amended CWA section 405 to establish a comprehensive sewage sludge program <www.epa.gov/OW-OWM.html/mtb/biosolids/index.htm>. The program regulates the use and disposal of sewage sludge by POTWs and by other TWTDS. TWTDS include facilities that generate sewage sludge, provide commercial treatment of sewage sludge, manufacture a product derived from sewage sludge, or provide disposal of sewage sludge. CWA section 405 required EPA to develop technical standards that establish sewage sludge management practices and acceptable levels of toxic pollutants in sewage sludge. The terms *biosolids*, *sewage sludge*, and *municipal sludge* are used interchangeably throughout this document.

Regulations for state sewage sludge program approval are at Part 123 or Part 501 (depending on whether the state wishes to administer the sewage sludge program under its NPDES program or under another program, e.g., a solid waste program). The technical standards governing sewage sludge use and disposal are in Part 503. TWTDS not otherwise subject to the NPDES permit requirements under CWA section 402 must apply for and receive a permit addressing standards for use and disposal of sewage sludge in Part 503. Details of this rule are described in *A Plain English Guide to the EPA Part 503 Biosolids Rule*[2] <www.epa.gov/owm/mtb/biosolids/503pe/>. Where applicable, sewage sludge management requirements may be included as a special condition in permits issued to POTWs. Section 9.2.2 of this manual includes a discussion on incorporating special conditions that address sewage sludge requirements.

2.3.1.4 Combined Sewer Overflows (CSOs)

An additional concern for some older POTWs may be combined *sewer systems* (CSS), which are wastewater collection systems owned by a state or municipality [as defined by CWA section 502(4)] that convey sanitary wastewater (domestic, commercial and industrial wastewaters) and stormwater through a single-pipe system to a POTW [as defined by § 403.3(q)]. EPA estimates that CSSs serve about 40 million people in 772 communities nationwide <www.epa.gov/npdes/cso/csodem>. During dry weather, CSSs collect and convey domestic, commercial, and industrial wastewater to a POTW; however, during periods of rainfall, snowmelt, and other forms of precipitation, the systems can become overloaded. When that overloading occurs, the CSS can overflow at designed relief points and discharge a combination of untreated sanitary wastewater and stormwater directly to a surface waterbody.

A combined sewer overflow (CSO) <www.epa.gov/npdes/cso> is the discharge from a CSS at a point before the POTW. CSOs can be a major source of water pollution in communities served by CSSs. CSOs often contain high levels of suspended solids (SS), pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants, causing water quality standards to be exceeded.

To address CSOs, EPA issued the National CSO Control Strategy (54 FR 37370, September 8, 1989). While implementation of the 1989 strategy has resulted in progress toward controlling CSOs, significant public health and water quality risks remain. To expedite compliance with the CWA, and to elaborate on the 1989 strategy, EPA, after collaboration with other CSO stakeholders (communities with CSSs, state water quality authorities, and environmental groups), published the CSO Control Policy <www.epa.gov/npdes/cso/controlpolicy> (59 FR 18688, April 19, 1994). The 1994 CSO policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities, and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives. The Wet Weather Water Quality Act of 2000 stipulates that NDPES permits, enforcement orders, or decrees must conform to the 1994 CSO Policy [CWA section 402(q)].

Before issuing a permit with conditions that address CSOs, permit writers should consult the CSO Control Policy and associated guidance. Section 9.2.3 of this manual includes a discussion on incorporating appropriate CSO permit conditions.

2.3.1.5 Sanitary Sewer Overflows (SSOs)

Properly designed, operated, and maintained sanitary sewer systems are meant to collect and transport all the sewage that flows into them to a POTW; however, occasional, unintentional spills of raw sewage from municipal sanitary sewers occur in almost every system. Such types of releases are called sanitary sewer overflows (SSOs) <www.epa.gov/npdes/sso>.

SSOs have a variety of causes including severe weather, improper system operation and maintenance, and vandalism. EPA estimates that over 40.000 SSO events occur per year in the United States (excluding basement backups). Overflows of untreated wastewater can present risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. A description of the extent of human health and environmental impacts caused by releases of untreated sewage, along with other information, is provided in the *Report to Congress on the Impacts and Control of CSOs and SSOs*[3] <www.epa.gov/npdes/csossoreport2004>. That 2004 report shows that NPDES permit requirements establishing clear reporting, record keeping, third party notification of overflows from municipal sewage collection systems, and clear requirements to properly operate and maintain the collection system, are critical to effective program implementation.

EPA has developed a draft fact sheet <www.epa.gov/npdes/pubs/sso_fact_sheet_model_permit_cond.pdf> and draft model permit conditions <www.epa.gov/npdes/pubs/sso_model_permit_conditions.pdf> that explain how NPDES permitting authorities can better address SSOs and sanitary sewer collection systems. Section 9.2.4 of this manual discusses incorporation of conditions to address SSOs in NPDES permits.

2.3.1.6 Municipal Separate Storm Sewer Systems (MS4s)

Stormwater from major metropolitan areas is a significant source of pollutants discharged to waters of the United States. While rainfall and snow are natural events, the nature of stormwater discharges and their impact on receiving waters are greatly affected by human activities and land use. Stormwater from lands modified by human activities, such as metropolitan areas and urban streets, can affect surface water resources by modifying natural flow patterns or by elevating pollution concentrations and loadings.

To address such concerns, the 1987 amendments to the CWA added section 402(p), a provision that directed EPA to establish phased NPDES requirements for stormwater discharges. Phase I of the stormwater program addresses permits for discharges from medium and large MS4s serving a population of 100,000 or more, as well as certain categories of industrial activity, including construction activity disturbing greater than 5 acres. Phase II expanded the stormwater program to include small MS4s and construction activity disturbing between 1–5 acres.

The MS4 stormwater application regulations (Phase I) established requirements for a two-part permit application that allowed large and medium local governments to help define priority pollutant sources in the municipality and to develop and implement appropriate controls for such discharges to MS4s (55 FR 47990, November 16, 1990). Part II of the application requires municipal applicants to propose municipal stormwater management programs to control pollutants to the *maximum extent practicable* (MEP) and to effectively prohibit non-stormwater discharges to the municipal system. Medium and large MS4 operators are required to submit comprehensive permit applications and are issued individual permits.

Phase II of the stormwater program extended the NPDES permitting program to small MS4s in urbanized areas (64 FR 68722, December 8, 1999). The Phase II MS4 regulations require small MS4s to develop a program to address six *minimum control measures* that include BMPs and measurable goals for each BMP. Permit writers have the option of permitting regulated small MS4 operators using an individual permit, a general permit, or a modification of an existing Phase I MS4's individual permit (although the vast majority of small MS4s have been covered under general permits).

Municipal stormwater management programs combine source controls and management practices that address targeted sources in the boundaries of the municipal system. For example, a municipality that expects significant new development may focus more on proposing requirements for new development and construction. On the other hand, a municipality that does not expect significant new development could focus more on municipal activities that affect stormwater quality such as: maintenance of leaking sanitary sewers, road de-icing and maintenance, operation of municipal landfills, flood control efforts, and control of industrial contributions of stormwater.

MEP is not precisely defined so as to allow maximum flexibility in MS4 permitting to optimize reductions in stormwater pollutants on a location-by-location basis (64 FR 68754, December 8, 1999). Therefore, permit writers must rely on application requirements specified in the regulations and the applicant's proposed management program when developing appropriate permit conditions. The stormwater Phase II rule was challenged in the courts, with the U.S. Court of Appeals for the Ninth Circuit generally upholding the Phase II rule but remanding three issues back to EPA. EPA issued guidance on April 16, 2004 for how new general permits should address the remanded issues of public availability of notices of intent (NOIs), opportunity for public hearings, and permitting authority reviews of NOIs titled *Implementing the Partial Remand of the Stormwater Phase II Regulations Regarding*

Notices of Intent & NPDES General Permitting for Phase II MS4s[4] <www.epa.gov/npdes/pubs/hanlonphase2apr14signed.pdf>.

In addition to information on the Stormwater Discharges From Municipal Separate Storm Sewer Systems (MS4s) Website <www.epa.gov/npdes/stormwater/municipal>, EPA has developed the following guidance documents and memoranda to help permit writers and permittees implement the municipal stormwater program:

- *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharge from Municipal Separate Storm Sewer Systems*[5] <www.epa.gov/npdes/pubs/owm0246.pdf>.
- *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits*[6] <www.epa.gov/npdes/pubs/swpol.pdf>.
- *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*[7] <www.epa.gov/npdes/pubs/final-wwtmdl.pdf>.
- *MS4 Program Evaluation Guidance*[8] <www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf>.
- *MS4 Permit Improvement Guide*[9] <www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf>.

The application requirements for stormwater discharges from MS4s serving a population greater than 100,000 and for stormwater discharges from small MS4s are discussed in sections 4.3.10 and 4.3.11 of this manual.

2.3.2 NPDES Program Areas Applicable to Non-Municipal Sources

Non-municipal sources include industrial and commercial facilities, industrial stormwater (including large construction activities), and discharges from small construction activity, concentrated animal feeding operations (CAFOs) and concentrated aquatic animal production (CAAP) facilities. Unlike municipal sources, the types of raw materials, production processes, treatment technologies used and pollutants discharged at industrial facilities vary widely and are dependent on the type of industry and specific facility characteristics. The operations, however, generally are carried out within a more clearly defined area; thus, the collection systems are less complex than POTW collection systems. In addition, unlike biosolids at POTWs, the NPDES program does not regulate residuals (sludge) generated by non-municipal facilities.

Non-municipal facilities can have discharges of stormwater that might be contaminated through contact with manufacturing activities or raw material and product storage, or they can have non-process wastewater discharges such as non-contact cooling water. In addition, some non-municipal facilities take in cooling water. Those discharges and intakes may be regulated under an NPDES permit in addition to any process wastewater.

2.3.2.1 Process Wastewater

Industrial and commercial facilities often use water in the manufacture and processing of products. The regulations at § 122.2 define process wastewater as, "[a]ny water which, during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product."

Process wastewater can contain pollutants at levels that could affect the quality of receiving waters. The NPDES permit program establishes specific requirements for discharges of process wastewater from industrial and commercial sources. If a facility discharges directly to surface water, it would require an individual or general NPDES permit. An industrial or commercial facility also may discharge wastewater to a municipal sewer system, which would be covered under the NPDES pretreatment program. Many types of industrial facilities, whether they discharge directly to surface water or to a municipal sewer system, are covered by effluent guidelines and standards (see section 5.2 of this manual). The stormwater that runs off the property of an industrial or commercial facility or from a construction site might require an NPDES permit under the industrial stormwater program (see section 2.3.2.3 below).

2.3.2.2 Non-Process Wastewater

Industrial and commercial facilities often use water for purposes other than processing products, such as using non-contact cooling water for heat exchange, and may discharge wastewater from sources such as sanitary or cafeteria wastes. Like process wastewater, non-process wastewater is regulated under the NPDES program. Non-process wastewater might also be important to the permit writer when drafting monitoring conditions for facilities where the non-process wastewater dilutes the concentration of pollutants of concern in process wastewater. The permit writer must ensure that specified monitoring locations ensure accurate measurement for compliance with all effluent limitations.

2.3.2.3 Stormwater Associated with Industrial Activity

To minimize the impact of stormwater discharges from industrial facilities, the NPDES program includes an industrial stormwater permitting component. Operators of industrial facilities included in 1 of the 11 categories of stormwater discharges associated with industrial activity that discharge or propose to discharge stormwater to an MS4 or directly to waters of the United States require authorization under an NPDES industrial stormwater permit. EPA published permit regulations and permit application requirements for stormwater discharges associated with industrial activity in 55 FR 48063, November 16, 1990.

Permit Regulations for Stormwater Associated with Industrial Activity

The regulations define stormwater discharges associated with industrial activity as discharges from any conveyance used for collecting and conveying stormwater and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. The regulations at § 122.26(b)(14)(i - xi) identify the following 11 industrial categories required to apply for NPDES permits for stormwater discharges:

- Facilities subject to stormwater effluent guidelines, new source performance standards, or toxic pollutant effluent standards under Parts 400-471 (Subchapter N).
- Certain heavy manufacturing facilities (lumber, paper, chemicals, petroleum refining, leather tanning, stone, clay, glass, concrete, ship construction).
- Active and inactive mining operations and oil and gas operations with contaminated stormwater.
- Hazardous waste treatment, storage, or disposal facilities, including Resource Conservation and Recovery Act (RCRA) Subtitle C facilities.
- Landfills, land application sites, open dumps, and RCRA Subtitle D facilities.

- Recycling facilities, including metal scrap yards, battery reclaimers, salvage yards, and automotive junkyards.
- Steam electric power generating facilities, including coal-handling sites.
- Transportation facilities that have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations.
- Major POTW sludge handling facilities, including on-site application of sewage sludge.
- Construction activities that disturb five acres or more (see subsection below).
- Light industrial manufacturing facilities.

Operators of industrial facilities that are federally, state- or municipally owned or operated that meet the above descriptions must also submit applications.

EPA issued a final rule for Phase II of the stormwater program in 64 FR 68722, December 8, 1999. That rule clarified that stormwater discharges from industrial facilities that have *no exposure* of industrial activities or materials to stormwater may be conditionally excluded from the stormwater permitting program. To qualify for the no exposure exclusion, the industrial operator must complete a no exposure certification form and submit this to EPA once every 5 years. For more information, see the Conditional No Exposure Exclusion Website <www.epa.gov/npdes/stormwater/noexposure>.

Generally, EPA- or state-issued general permits regulate stormwater discharges from industrial, construction and Phase II municipal sources, while Phase I municipal sources usually are issued individual permits. In some cases, stormwater conditions may be incorporated into a comprehensive individual NPDES permit for a facility or a stormwater-specific individual NPDES permit. Incorporating permit conditions to address stormwater discharges associated with industrial and construction activities into an individual facility permit is discussed in the subsections below. For more information regarding the scope of the NPDES stormwater program, see the NPDES Stormwater Program Website <www.epa.gov/npdes/stormwater>.

Permit Conditions for Stormwater Discharges Associated with Industrial Activity

All stormwater discharges associated with industrial activity that discharge stormwater through a separate MS4 or discharge directly to waters of the United States are required to obtain an NPDES permit. Because of the large number of facilities requiring permits, EPA and most NPDES-authorized states choose to issue general permits to regulate stormwater discharges. The Phase I rule in 1990 established the concept of a permitting exemption for industrial facilities with little or no likelihood of discharging contaminated stormwater; however, this exemption was not well-defined or required to be submitted to the NPDES permitting authority. The Phase II rule in December 1999 clarified and expanded the no exposure certification requirement to require industrial facilities with no exposure of industrial processes to stormwater to submit a written certification notifying EPA or the authorized state that the facility wishes to be excluded from the NPDES program.

Each industrial facility covered under an EPA-issued stormwater general permit must meet the numeric and non-numeric effluent limitations established in the general permit. Industrial facilities can meet those effluent limitations by implementing control measures, including BMPs, that control the discharge of stormwater associated with industrial activity.

The EPA- and state-issued stormwater general permits generally require the facility to develop and implement a site-specific *stormwater pollution prevention plan* (SWPPP). The SWPPP describes the control measures, whether structural or nonstructural, which are used for controlling stormwater discharges from the industrial facility. The special conditions component of EPA's stormwater general permits identifies the requirements that must be documented in the SWPPP, including the following:

- A description of potential pollutant sources at the facility, including the following:
  - A map of the facility indicating the drainage areas of the site and the industrial activities that occur in each drainage area.
  - An inventory of materials that could be exposed to stormwater.
  - A description of the likely sources of pollutants from the site and a prediction of the pollutants likely to be present in the stormwater.
  - The history of spills and leaks of toxic and hazardous materials over the past 3 years.
- The measures and controls that will be implemented to prevent or minimize pollution of stormwater, including the following:
  - Good housekeeping or upkeep of industrial areas exposed to stormwater.
  - Preventive maintenance of stormwater controls and other facility equipment.
  - Spill prevention and response procedures.
  - Testing of outfalls to ensure that there are no illicit discharges.
  - Employee training on pollution prevention measure and controls, and record keeping.

A permit writer's best sources of information for developing appropriate special conditions for stormwater control measures are other stormwater general permits. Using existing general permits as the basis for special conditions is encouraged because doing so will reduce duplication of effort. A listing of individual and general permits (stormwater and non-stormwater) issued by EPA and authorized states is on the View NPDES Individual and General Permits Website <www.epa.gov/npdes/permitsearch>. In addition to the Stormwater Discharge From Industrial Facilities Website <www.epa.gov/npdes/stormwater/indust>, EPA published *Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators*[10] <www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf> to help permit writers identify components of SWPPPs and BMPs and to help permittees develop their own plans. Section 4.3.8 of this manual discusses Form 2F and individual permit requirements for stormwater discharges associated with industrial activity.

Permit Conditions for Stormwater Discharges associated with Construction Activities

EPA and most NPDES-authorized states have issued NPDES general stormwater permits for discharges associated with construction activity that are separate from the industrial stormwater general permits. The Phase I stormwater regulations require permit coverage for all construction activity that results in the disturbance of five acres or greater of the total land area. This includes disturbance of less than five acres of total land area that is part of larger common plan of development or sale if the larger common plan will ultimately disturb five acres of more. The Phase II stormwater regulations require permit coverage for all construction activity that result in land disturbance of equal to or greater than one acre and less than five acres. This includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one and less than five acres. Since March 2003, most construction activity disturbing one to five acres has been required to comply with the conditions of the relevant NPDES permit (typically under the relevant construction general permit for stormwater discharges), though states have the option of not requiring the submittal of NOIs for stormwater discharges associated with small construction activity.

EPA and NPDES-authorized state permitting authorities may include permit conditions that incorporate qualifying state or local erosion and sediment control program requirements by reference. A qualifying state or local erosion and sediment control program is one that includes the requirements at § 122.44(s). Once EPA or an NPDES authorized state identifies and incorporates a qualifying local program in their NPDES construction general permit, operators can follow the erosion and sediment control requirements of the qualifying local program. By incorporating the qualifying local program by reference the permitting authority can avoid duplicative or conflicting erosion and sediment control requirements between the local program requirements and the NPDES general permit control requirements addressing stormwater discharges associated with construction activity. Operators that are engaged in construction activity within a qualifying program must still submit an NOI under the appropriate construction general permit and comply with all other permit conditions.

The permit requirements in a construction general permit may be similar to those in an industrial general permit, including the development of a SWPPP. In addition to the Stormwater Discharges from Construction Activities Website <www.epa.gov/npdes/stormwater/construction>, EPA also developed the Stormwater Pollution Prevention Plans for Construction Activities Website <www.epa.gov/npdes/swpppguide>. Section 4.3.9 of this manual discusses individual permit requirements for stormwater discharges associated with construction activity.

2.3.2.4 Cooling Water Intake Structures

CWA section 316(b) provides that any standard established pursuant to CWA sections 301 or 306 and applicable to a point source will require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. This CWA provision is unique because it addresses the *intake* of water, in contrast to other provisions that regulate the discharge of pollutants into waters of the United States. EPA has established national performance standards under CWA section 316(b) designed to reduce the impingement and entrainment of fish and other aquatic organisms as they are drawn into a facility's cooling water intake structure(s). Impingement occurs when organisms are trapped against cooling water intake structures by the force of water being drawn through the intake structure. Entrainment occurs when organisms are drawn through a cooling water intake structure into a cooling system, through the heat exchanger, and then pumped back out into the waterbody. For more information, see section 4.3.12 of this manual.

In April 1976, EPA published regulations at Part 402 to address cooling water intake structures. Fifty-eight electric utility companies challenged the final rule. The U.S. Court of Appeals for the Fourth Circuit remanded the rule in 1977, and in 1979, EPA withdrew Part 402. Beginning in 1977, NPDES permit authorities made decisions implementing CWA section 316(b) on a case-by-case basis using best professional judgment (BPJ) (§§ 125.90(b) and 401.14).

In the 1990s, EPA began developing CWA section 316(b) regulations establishing national standards. EPA divided the rulemaking into three phases:

- Phase I addressed new facilities and was completed in December 2001 (Part 125, Subpart I).
- Phase II addressed existing electric generating plants that use at least 50 million gallons per day (mgd) of cooling water was completed in July 2004 (Part 125, Subpart J).

- Phase III addressed other existing facilities, including small existing electric generating plants that use less than 50 mgd of cooling water, manufacturers, and new offshore and coastal oil and gas extraction facilities.

The Phase III regulations, finalized in June 2006, establish national standards only for new offshore and coastal oil and gas extraction facilities (Part 125, Subpart N). EPA decided that other Phase III industrial facilities withdrawing water for cooling purposes would not be covered by national standards but would continue to be subject to CWA section 316(b) requirements set by the NPDES Permitting Director on a case-by-case, BPJ basis (§§ 125.90(b) and 401.14).

All three regulations were subject to judicial challenges. While the Phase I rule was largely upheld, the court reviewing the Phase II regulation rejected a number of its provisions. Under remands from the reviewing courts, EPA is reevaluating the Phase II regulation and the decision in the Phase III regulation not to establish national standards for existing Phase III facilities. In the interim, as noted above, NPDES permits must include CWA section 316(b) conditions developed on a case-by-case basis. For the most current information on regulatory requirements, see the Cooling Water Intake Structure Program Website <www.epa.gov/waterscience/316b/>, and for additional Cooling Water Intake Structures regulatory requirements, see section 4.3.12 of this manual.

2.3.2.5 Concentrated Animal Feeding Operations (CAFOs)

Animal feeding operations (AFOs) are agricultural facilities where animals are kept and raised in confined situations. AFOs typically maintain animals, feed, and manure and have production operations in a limited land area. Manure and wastewater from AFOs have the potential to contribute pollutants such as nitrogen and phosphorus, organic matter, sediments, pathogens, heavy metals, hormones, antibiotics, and ammonia to the environment. An AFO is a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

- Animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period.
- Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

AFOs that meet the regulatory definition of a CAFO, or that are designated as CAFOs by the permitting authority, and that discharge or propose to discharge are required to be permitted under the NPDES permitting program.

An animal operation must meet the definition of an AFO [§ 122.23(b)(1)] before it can be considered a CAFO. To be defined as a CAFO, an AFO must meet the regulatory definition [§§ 122.23(b)(4) or 122.23(b)(6)] of a large or medium CAFO or must be designated by the permitting authority [§ 122.23(c)]. Only CAFOs that discharge or propose to discharge are subject to NPDES permitting requirements.

CAFOs are subject to requirements that limit discharges from the production area and requirements applicable to land application areas under the control of the CAFO operator. Large CAFOs are subject to a no discharge requirement for production areas, whereas other CAFOs are subject to BPJ requirements for their production areas. One of the principal substantive pollution control conditions in any CAFO

permit is the requirement to implement the terms of the nutrient management plan (NMP) incorporated into the permit when permit authorization is granted. For more information, see the Animal Feeding Operations Website <www.epa.gov/npdes/cafo>. In addition, section 4.3.4 of this manual discusses application requirements for CAFOs.

2.3.2.6 Concentrated Aquatic Animal Production (CAAP) Facilities

CAAP facilities also are regulated under the NPDES program. In 2004 EPA promulgated new effluent guidelines that address CAAP facilities. The effluent guidelines apply to CAAP facilities (flow-through, recirculating, and net pen) that directly discharge wastewater and have annual production equal to or greater than 100,000 pounds of aquatic animals. The rule requires a BMP plan and implementation of measures, including recordkeeping and reporting requirements, to minimize discharges of solids, to prevent spills of drugs, feed, and chemicals that could result in discharges to waters of the United States, and to ensure proper maintenance of the facility. A facility that does not meet the effluent guideline threshold might still need an NPDES permit if it meets the CAAP facilities thresholds established in the NPDES regulations at § 122.24(b) or if it is designated as a CAAP facility under the designation authority in § 122.24(c). For more information, see the Aquatic Animal Production Industry Effluent Guidelines Website <www.epa.gov/guide/aquaculture/>.

2.3.2.7 Vessel Discharges

On March 30, 2005, the U.S. District Court for the Northern District of California (in *Northwest Environmental Advocates et al. v. EPA*) ruled that the EPA regulation excluding discharges incidental to the normal operation of a vessel from NPDES permitting exceeded the Agency's authority under the CWA. On September 18, 2006, the Court issued an order revoking this regulation [40 CFR 122.3(a)] as of September 30, 2008. EPA appealed the District Court's decision, and on July 23, 2008, the Ninth Circuit upheld the decision, leaving the September 30, 2008, *vacatur* date in effect. In response to the Court order, EPA developed two proposed permits to regulate discharges from vessels. The district court ultimately extended the date of *vacatur* to February 6, 2009.

In July 2008, Congress amended the CWA (P.L. No. 110-288) to add a new section 402(r), which excludes discharges incidental to the normal operation of a recreational vessel from NPDES permitting. Instead, it directs EPA to regulate those discharges under a newly created CWA section 312(o). As a result of the law, EPA did not finalize the previously proposed Recreational Vessel General Permit and is instead undertaking rulemaking to develop BMPs for these vessels under the authority of CWA section 312(o).

In July 2010 P.L. 111-215 (Senate Bill S. 3372) was signed into law. This law amends P.L. 110-299 (Senate Bill S. 3298), which generally imposes a moratorium during which time neither EPA nor states may require NPDES permits for discharges incidental to the normal operation of commercial fishing vessels and other non-recreational vessels less than 79 feet. As a result, of P.L. 110-299, the Vessel General Permit (VGP) does not cover vessels less than 79 feet, or commercial fishing vessels, unless they have ballast water discharges. P.L. 111-215 extended the expiration date of the moratorium from July 31, 2010, to December 18, 2013.

As a result of the court ruling, EPA issued the VGP on December 18, 2008. The 2008 VGP regulates discharges incidental to the normal operation of vessels operating in a capacity as a means of transportation. The VGP includes the following:

- general effluent limits applicable to all discharges.
- general effluent limits applicable to 26 specific discharge streams.
- narrative water-quality based effluent limits.
- inspection, monitoring, recordkeeping, and reporting requirements.
- additional requirements applicable to certain vessel types.

EPA estimates that approximately 61,000 domestically flagged commercial vessels and approximately 8,000 foreign flagged vessels could be affected by this permit.

Because this area of the NPDES permit program is relatively new and continues to evolve, for the most current information, see EPA's Vessel Discharges Website <www.epa.gov/npdes/vessels>.

2.4 Major/Minor Facility Designation

In addition to categorizing facilities as municipal and non-municipal, EPA has also developed criteria to determine which of the sources should be considered *major facilities*. The distinction was made initially to assist EPA and states in setting priorities for permit issuance and reissuance. The regulations at § 122.2 define major facility as, "any NPDES *facility or activity* classified as such by the Regional Administrator, or in the case of *approved state programs*, the Regional Administrator in conjunction with the [s]tate Director." All facilities that are not designated as *majors* are considered *minor* facilities.

Through policy, including the memoranda *Procedures for Revising the Major Permit List*[11] <www.epa.gov/npdes/pubs/owm0364.pdf> and *Delegation of Updates to Major/Minor Lists*[12] <www.epa.gov/npdes/pubs/owm0142.pdf>, EPA has established working definitions for POTW and non-municipal major facilities. For POTWs, major facilities are those that have a design flow of one million gallons per day or greater or serve a population of 10,000 or more or cause significant water quality impacts. Non-POTW discharges are classified as major facilities on the basis of the number of points accumulated using the NPDES Permit Rating Work Sheet <www.epa.gov/npdes/pubs/owm0116.pdf>. The worksheet evaluates the significance of a facility using several criteria, including toxic pollutant potential, flow volume, and water quality factors such as impairment of the receiving water or proximity of the discharge to coastal waters.

2.5 Growth and Change in the NPDES Program

The basic structure of the NPDES program has remained the same since the 1972 Federal Water Pollution Control Act amendments, but as EPA develops new regulations, policies, and guidance or modifies existing program requirements and guidance, the existing program is refined and new aspects of the program can emerge. To stay informed about the most recent program developments, permit writers should visit EPA's NPDES Program Website <www.epa.gov/npdes/> frequently.

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[3] U.S. Environmental Protection Agency. 2004. *Report to Congress on the Impacts and Control of CSOs and SSOs.* EPA 833-R-04-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/csossoreport2004>.

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[5] U.S. Environmental Protection Agency. 1992. *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems*. EPA-833/B-92-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0246.pdf>.

[6] Perciasepe, R. 1996. *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits*. U.S. Environmental Protection Agency, Office of Water. Memorandum, September 1, 1996. <www.epa.gov/npdes/pubs/swpol.pdf>.

[7] Wayland, R.H., III, and J.A. Hanlon. 2002. *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs.* U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds and Office of Wastewater Management. Memorandum, November 22, 2002. <www.epa.gov/npdes/pubs/final-wwtmdl.pdf>.

[8] U.S. Environmental Protection Agency. 2007. *MS4 Program Evaluation Guidance.* EPA-833-R-07-003. U.S. Environmental Protection Agency, Office of Wastewater Management. Washington, DC. <www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf>.

[9] U.S. Environmental Protection Agency. 2010. *MS4 Permit Improvement Guide*. EPA833-R-10-001. U.S. Environmental Protection Agency. Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf>

[10] U.S. Environmental Protection Agency. 2009. *Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators*. EPA 833-B-09-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf>.

[11] Dougherty, Cynthia. 1988. *Procedures for Revising the Major Permit List.* U.S. Environmental Protection Agency, Permits Division. Memorandum, December 28, 1988. <www.epa.gov/npdes/pubs/owm0364.pdf>.

[12] Pendergast, James F. 1995. *Delegation of Updates to Major/Minor Lists.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, February 6, 1995. <www.epa.gov/npdes/pubs/owm0142.pdf>.

CHAPTER 3. Overview of the NPDES Permitting Process

This chapter presents an overview of the different types of National Pollutant Discharge Elimination System (NPDES) permits, the major permit components, and the permit development and issuance process. The permit process is illustrated by flow charts. The tasks identified within the flow charts are described in detail in subsequent chapters.

3.1 Types of Permits

The two basic types of NPDES permits are individual and general permits. These permit types share the same components but are used under different circumstances and involve different permit issuance processes.

3.1.1 Individual Permits

An individual permit is a permit specifically tailored to an individual facility. Upon receiving the appropriate application form(s), the permitting authority develops a permit for that facility on the basis of information from the permit application and other sources (e.g., previous permit requirements, discharge monitoring reports, technology and water quality standards, total maximum daily loads, ambient water quality data, special studies). The permitting authority then issues the permit to the facility for a specific period not to exceed 5 years, with a requirement to reapply before the expiration date.

3.1.2 General Permits

A permitting authority develops and issues a general permit to cover multiple facilities in a specific category of discharges or of sludge use or disposal practices. General permits can be a cost-effective option for agencies because of the large number of facilities that can be covered under a single permit. According to Title 40 of the *Code of Federal Regulations* (CFR) 122.28(a)(2), general permits may be written to cover stormwater point sources or other categories of point sources having the following common elements:

- Sources that involve the same or substantially similar types of operations.
- Sources that discharge the same types of wastes or engage in the same types of sludge use or disposal.
- Sources that require the same effluent limitations or operating conditions, or standards for sewage sludge use or disposal.
- Sources that require the same monitoring where tiered conditions may be used for minor differences within a class (e.g., size or seasonal activity).
- Sources that are more appropriately regulated by a general permit.

The regulations at § 122.28(a)(1) provide for general permits to cover dischargers within an area corresponding to specific geographic or political boundaries such as the following:

- Designated planning area.
- Sewer district.
- City, county, or state boundary.

- State highway system.
- Standard metropolitan statistical area.
- Urbanized area.

The regulation also allows a general permit to cover any other appropriate division or combination of such boundaries. For example, EPA has issued general permits that cover multiple states, territories, and tribes where EPA is the permitting authority.

Where a large number of similar facilities require permits, a general permit allows the permitting authority to allocate resources in a more efficient manner and to provide more timely permit coverage than issuing an individual permit to each facility. In addition, using a general permit ensures consistent permit conditions for comparable facilities.

3.2 Major Components of a Permit

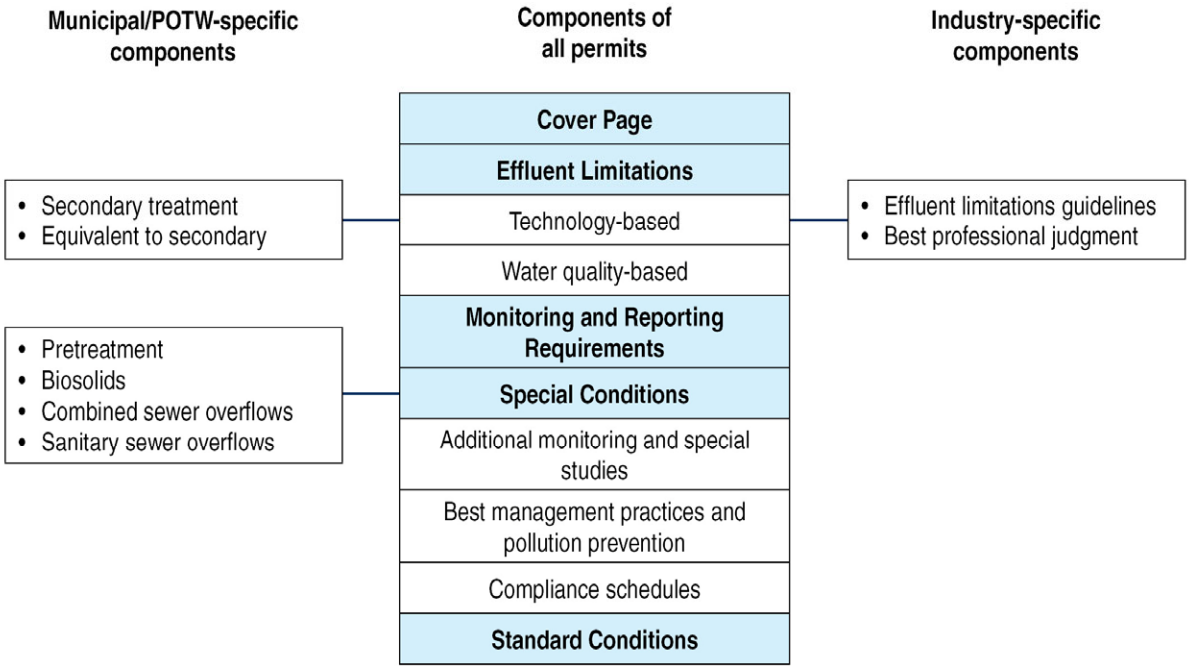
All NPDES permits consist, at a minimum, of five sections:

- **Cover Page:** Contains the name and location of the permittee, a statement authorizing the discharge, and a listing of the specific locations for which a discharge is authorized.
- **Effluent Limitations:** The primary mechanism for controlling discharges of pollutants to receiving waters. A permit writer spends the majority of his or her time, when drafting a permit, deriving appropriate effluent limitations on the basis of applicable technology and water quality standards.
- **Monitoring and Reporting Requirements:** Used to characterize wastestreams and receiving waters, evaluate wastewater treatment efficiency, and determine compliance with permit conditions.
- **Special Conditions:** Conditions developed to supplement numeric effluent limitations. Examples include additional monitoring activities, special studies, best management practices (BMPs), and compliance schedules.
- **Standard Conditions:** Pre-established conditions that apply to all NPDES permits and delineate the legal, administrative, and procedural requirements of the NPDES permit.

In addition to the components of the permit, a fact sheet or statement of basis explaining the rationale for permit conditions makes up part of the documentation that supports a draft permit. Section 11.2 of this manual includes additional discussion of permit documentation and the required elements of a fact sheet or statement of basis.

Although the major sections of a permit listed above are part of all permits, the contents of some sections vary depending on the nature of the discharge (e.g., municipal effluent, industrial process wastewater, stormwater, vessel discharges) and whether the permit is issued to an individual facility or to multiple dischargers (i.e., a general permit). Exhibit 3-1 shows the components of a permit and highlights some distinctions between the contents of NPDES permits for municipal (i.e., POTW) and industrial facilities. Permit writers should note that it is common for different permitting authorities to use different names for each section of a permit.

Exhibit 3-1 Permit components



3.3 Overview of the Development and Issuance Process for NPDES Individual Permits

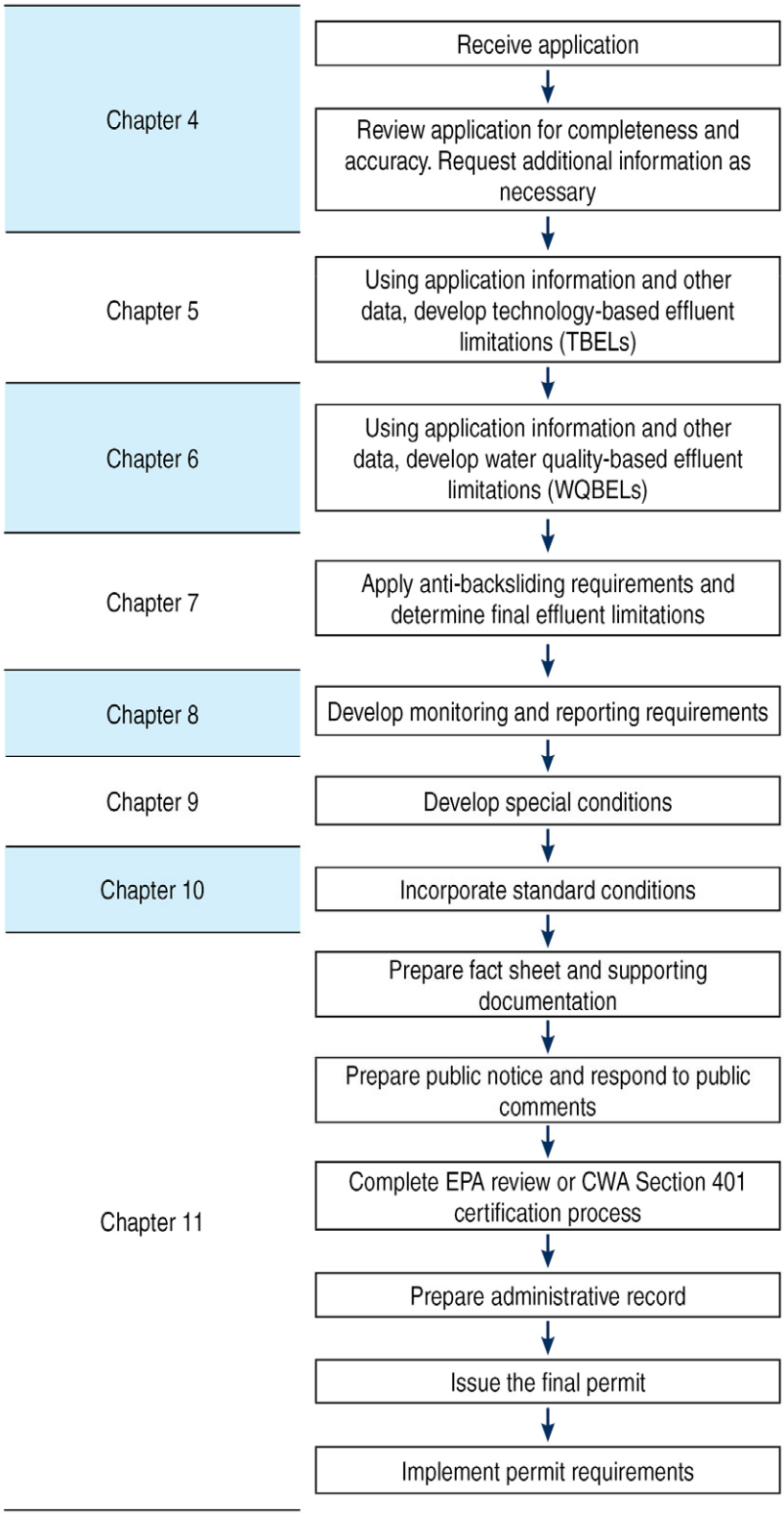
While the limitations and conditions in NPDES individual permits are unique to each permittee, the process used to develop the limitations and conditions and issue each permit generally follows a common set of steps. Exhibit 3-2 illustrates the major steps to develop and issue NPDES individual permits and also serves as an index for the subsequent chapters of this manual by identifying which chapter presents more detailed information on each step.

For individual permits, the permitting process generally begins when a facility operator submits an application. After receiving the application and making a decision to proceed with the permit, the permit writer reviews the application for completeness and accuracy. When the permit writer determines that the application is complete and has any additional information needed to draft the permit, the permit writer develops the draft permit and the justification for the permit conditions (i.e., the fact sheet or statement of basis).

The first major step in the permit development process is deriving technology-based effluent limitations (TBELs). Following that step, the permit writer derives effluent limitations that are protective of state water quality standards (i.e., water quality-based effluent limitations [WQBELs]) as needed. The permit writer then compares the TBELs with the WQBELs and, after conducting an anti-backsliding analysis if necessary, applies the final limitations in the NPDES permit. The permit writer must document the decision-making process for deriving limitations in the permit fact sheet. It is quite possible that a permit will have limitations that are technology-based for some parameters and water quality-based for others. For example, a permit could contain effluent limitations for total suspended solids (TSS) based on national effluent limitations guidelines and standards (effluent guidelines) (technology-based), limitations for ammonia based on preventing toxicity to aquatic life (water quality-based), and limitations for 5-day

biochemical oxygen demand (BOD_5) that have different bases, such as an average monthly limitation based on effluent guidelines and a maximum daily limitation based on water quality standards.

Exhibit 3-2 Major steps to develop and issue NPDES individual permits



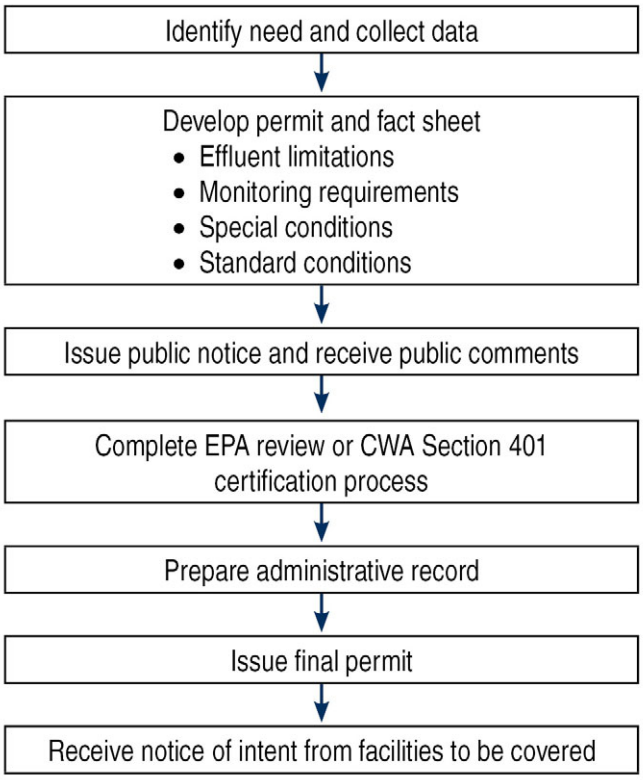
After effluent limitation development, the permit writer develops appropriate monitoring and reporting requirements and facility-specific special conditions. The permit writer then adds standard conditions, which are the same for all permits.

The next step is to provide an opportunity for public participation in the permit process and EPA review of the permit or, in the case of an EPA-issued permit, certification under CWA section 401 by the state with jurisdiction over the receiving water that the permit will comply with its water quality standards. The permitting authority issues a public notice announcing the draft permit and inviting interested parties to submit comments. If there is significant public interest, the permitting authority can hold a public hearing. Taking into consideration the public comments, the permitting authority then produces a final permit, with careful attention to documenting the process and decisions for the administrative record, and issues the final permit to the facility. The permitting authority might decide to make significant changes to the draft permit according to public comment and then provide another opportunity for public review and comment on the revised permit. Section 11.3 of this manual discusses items to address before final permit issuance in more detail.

3.4 Overview of the Development and Issuance Process for NPDES General Permits

The process for developing and issuing NPDES general permits is similar to the process for individual permits; however, there are some differences in the sequence of events. Exhibit 3-3 illustrates the major steps to develop and issue NPDES general permits.

Exhibit 3-3 Major steps to develop and issue NPDES general permits



For general permits, the permitting authority first identifies the need for a general permit and collects data that demonstrate that a group or category of dischargers has similarities that warrant a general permit. In deciding whether to develop a general permit, permitting authorities consider whether

- A large number of facilities will be covered.
- The facilities have similar production processes or activities.
- The facilities generate similar pollutants.
- Whether uniform WQBELs (where necessary) will appropriately implement water quality standards.

The remaining steps of the permit process are the same as for individual permits. The permitting authority develops a draft permit that includes effluent limitations, monitoring conditions, special conditions, and standard conditions. The permitting authority then issues a public notice and addresses public comments, completes the EPA review or CWA section 401 certification process, develops the administrative record, and issues the final permit. The final permit will also establish the requirements for the specific information that must be submitted by a facility that wishes to be covered under the general permit.

After the final general permit has been issued, facilities that wish to be covered under the general permit typically submit a Notice of Intent (NOI) to the permitting authority. After receiving the NOI, the permitting authority can request additional information describing the facility, notify the facility that it is covered by the general permit, or require the facility to apply for an individual permit.

The following chapters in this manual describe steps in the permitting process in detail. In general, the chapters focus on the steps necessary to develop and issue an individual permit, but much of the technical discussion applies equally to general permit development.

CHAPTER 4. NPDES Permit Application Process

This chapter describes the National Pollutant Discharge Elimination System (NPDES) permit application process, including the permit writer's role in reviewing the application and evaluating background information about the applicant. Through this process the permit writer gains an understanding of the circumstances of the discharge and the characteristics of the proposed effluent, which is necessary to develop appropriate permit limitations and conditions.

4.1 Who Applies for an NPDES Permit?

The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 122.21(a) require that any person, except persons covered by general permits under § 122.28, who discharges pollutants or proposes to discharge pollutants to waters of the United States must apply for a permit. Further, § 122.21(e) prohibits the permitting authority from issuing an individual permit until and unless a prospective discharger provided a complete application. This regulation is broadly inclusive and ties back to the Clean Water Act (CWA) section 301(a) provision that, except as in compliance with the act, "…the discharge of any pollutant by any person shall be unlawful."

In most instances, the permit applicant will be the owner (e.g., corporate officer) of the facility. However, the regulations at § 122.21(b) require that when a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit. The regulations also require the application to be signed and certified by a high-ranking official of the business or activity. The signatory and certification requirements are at § 122.22.

Permits (and applications) are required for most discharges or proposed discharges to waters of the United States; however, NPDES permits are not required for some activities as specified under the *Exclusions* provision in § 122.3. Exceptions include the following:

- Discharge of dredged or fill materials into waters of the United States which are regulated under CWA section 404.
- The introduction of sewage, industrial wastes or other pollutants into publicly owned treatment works (POTWs) by indirect dischargers.
- Any discharge in compliance with the instructions of an On-Scene Coordinator pursuant to Part 300 (The National Oil and Hazardous Substances Pollution Contingency Plan) or 33 CFR 153.10(e) (Pollution by Oil and Hazardous Substances).
- Any introduction of pollutants from nonpoint source agricultural and silvicultural activities, including stormwater runoff from orchards, cultivated crops, pastures, range lands, and forest lands, but not discharges from concentrated animal feeding operations as defined in § 122.23, discharges from concentrated aquatic animal production facilities as defined in § 122.24, discharges to aquaculture projects as defined in § 122.25, and discharges from silvicultural point sources as defined in § 122.27.
- Return flows from irrigated agriculture.

- Discharges into a privately owned treatment works, except as the Director may otherwise require under § 122.44(m).

While those types of discharges have been excluded from permitting requirements under the NPDES program, they might be subject to controls under other federal or state regulatory programs.

As of the date of this manual's publication, the exclusion for certain discharges incidental to the normal operation of a vessel is still in the CFR. Similarly, discharges from the application of pesticides consistent with all relevant requirements under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (i.e., those relevant to protecting water quality) are excluded from NPDES permit coverage in the following two circumstances: (1) the application of pesticides directly to waters of the United States to control pests, and (2) the application of pesticides to control pests that are present over waters of the United States, including near such waters, where a portion of the pesticides will unavoidably be deposited to waters of the United States to target the pests effectively. However, because of court decisions, the exclusions for vessels and pesticides are vacated as of February 6, 2009, and April 9, 2011, respectively. The effect of the *vacaturs* on the exclusions in § 122.3 is presented in Exhibit 4-1.

Exhibit 4-1 Effect of court decisions on § 122.3

Exclusion	Issue
Vessel Discharges (www.epa.gov/npdes/vessels)	The Court's ruling does not affect vessel discharge exemptions from permitting that are specifically provided for in the CWA itself. For example, § 502(6)(A) excludes from the act's definition of *pollutant* sewage from vessels (including graywater in the case of commercial vessels operating on the Great Lakes) and discharges incidental to the normal operation of a vessel of the Armed Forces within the meaning of CWA section 312. As another example, the CWA section 502(12)(B) provides that discharges from vessels (i.e., discharges other than those when the vessel is operating in a capacity other than as a means of transportation) do not constitute the, "discharge of a pollutant" when such discharges occur beyond the limit of the 3-mile territorial sea. Because both *a pollutant* and a *discharge of a pollutant* are prerequisites to the requirement to obtain an NPDES permit, those two statutory provisions have the effect of exempting the vessel discharges they address from the requirement to obtain an NPDES permit. In addition, in July 2008, Congress amended the CWA to add a new section 402(r) to the act, which excludes discharges incidental to the normal operation of a recreational vessel from NPDES permitting. For more information, see section 2.3.2.7 of this manual.
Pesticides (www.epa.gov/npdes/aquaticpesticides)	On January 7, 2009, the 6th Circuit Court vacated the final rule in *The National Cotton Council of America et al. v. United States Environmental Protection Agency*. The court held that while an NPDES permit is not required for chemical pesticide applications that leave no residuals, an NPDES permit is required for discharges (1) from chemical pesticide applications to or over, including near water, where there is a residual, or excess pesticide, in the water following the application, and (2) from all biological pesticide applications regardless of whether a residual is left. On June 8, 2009, the court granted a request from the U.S. Department of Justice for a 2-year stay of its decision, until April 9, 2011, to provide time for EPA and the states to develop and issue NPDES general permits for the discharge of pollutants from the application of pesticides. Before April 9, 2011, permits are not required for discharges from these applications when applied in accordance with the product's FIFRA label. Certain related activities continue to be exempt from permitting under the CWA (i.e., irrigation return flow and agricultural stormwater runoff).

4.2 Application Deadlines

The regulations at § 122.21(c) and (d) specify the time to apply for NPDES permits. Exhibit 4-2 summarizes the application deadline requirements for dischargers to be covered by an NPDES permit.

Exhibit 4-2 When to apply for an NPDES permit

Type of permit	Type of discharge	Schedule*
Individual	New	At least 180 days before the date on which the discharge is to commence
	Existing	At least 180 days before expiration date of existing permit
	Construction Stormwater	At least 90 days before the date on which construction is to commence
General	New	Specified in general permit
	Existing	X number of days following issuance of permit (specified in the general permit)

* Authorized states may use more stringent deadlines.

Anyone proposing a new discharge must apply to the permitting authority no later than 180 days before the expected commencement of the discharge if applying for an individual permit. Any person with an currently effective individual permit must submit an application to the permitting authority at least 180 days before the expiration of its existing individual permit unless permission for a later date has been granted in accordance with § 122.21(d). For general permits, the deadline for new dischargers to apply is specified in the general permit. A general permit also may specify a number of days after the general permit's issuance that operators of existing facilities are given to apply for coverage. Authorized states may have different schedules for permit applications, but their schedules may be no less stringent than the federal deadlines. The State Director or the Regional Administrator may allow an individual application to be submitted at dates later than those specified in the regulations, but not later than the expiration date of the existing permit.

Note that, according to § 122.6, the conditions of an expired NPDES permit remain in effect until the new permit is issued, as long as the discharger submitted a complete application in accordance with the timeframes prescribed in the regulations (or in accordance with state law, in the case of state-administered NPDES programs). If state law does not allow expired permits to remain in effect until a permit is reissued, or if the permit application is not on time and complete, the facility may be considered to be discharging without a permit from the time the permit expired until the effective date of the new permit.

4.3 Application Forms and Requirements for Individual Permits

When a facility needs an individual NPDES permit, it must submit a permit application. Application forms and requirements are specific to the type of facility and discharge. NPDES permit application requirements are in Part 122, Subpart B and identified on forms developed by the U.S. Environmental Protection Agency (EPA). Authorized states are not required to use the EPA application forms; however, any alternative form used by an authorized state must include the federal requirements at a minimum.

Exhibit 4-3 provides an overview of the types of dischargers required to submit NPDES application forms, identifies the forms that must be submitted, and references the corresponding NPDES regulatory citation. In some cases, a facility might need to file more than one application form. For example, an

existing industrial facility (i.e., renewal) discharging stormwater combined with process and non-process wastewater might need to submit Form 1, Form 2C, and Form 2F. Section 2.3 of this manual discusses the NPDES program areas that have application requirements presented below.

Exhibit 4-3 EPA application requirements for NPDES individual permits

Type of facility or program area	Status	Forms	Regulatory citations and additional application requirements (40 CFR)
Municipal facilities • POTWs with design flows greater than or equal to 0.1 million gallons per day (mgd)	New and existing	**Form 2A**, Parts A, B and C; Parts D, E, F, or G as applicable	• § 122.21(a)(2)(i)(B) • § 122.21(j)
• POTWs with design flows less than 0.1 mgd	New and existing	**Form 2A**, Parts A and C; Parts D, E, F, or G as applicable	• § 122.21(a)(2)(i)(B) • § 122.21(j)
TWTDS (sewage sludge)	New and existing	**Form 2S**	• § 122.21(a)(2)(i)(H) • § 122.21(q)
Concentrated animal production facilities • Concentrated animal feeding operations • Concentrated aquatic animal production facilities	New and existing	**Form 1** and **Form 2B**	• § 122.21(a)(2)(i)(A) and (C) • § 122.21(f) and (i)
Industrial facilities • Manufacturing facilities • Commercial facilities • Mining activities • Silvicultural activities	Existing	**Form 1** and **Form 2C**	• § 122.21(a)(2)(i)(A) and (D) • § 122.21(f) and (g)
	New (process wastewater)	**Form 1** and **Form 2D**	• § 122.21(a)(2)(i)(A) and (E) • § 122.21(f) and (k)
	New and existing (non-process wastewater)	**Form 1** and **Form 2E**	• § 122.21(a)(2)(i)(A) and (F) • § 122.21(f) and (h)
Stormwater discharges associated with industrial activities (except stormwater discharges associated with construction activity)	New and existing	**Form 1** and **Form 2F**	• § 122.21(a)(2)(i)(A) and (G) • § 122.21(f) • § 122.26(c)
Stormwater discharges associated with construction activity	New and existing	**Form 1**	• § 122.21(a)(2)(i)(A) • § 122.21(f) • § 122.26(c)(1)(ii)
Stormwater discharges from MS4s serving a population greater than 100,000	New and existing	None	• § 122.26(d)
Stormwater discharges from small MS4s	New and existing	None	• § 122.33 • § 122.21(f)
Cooling water intake structures	New and existing	None	• § 122.21(r)

4.3.1 Form 1: General Information

All facilities applying for an individual NPDES permit, with the exception of POTWs, treatment works treating domestic sewage (TWTDS), and municipal separate storm sewer systems (MS4s) applying for a municipal stormwater permit, must submit Form 1 <www.epa.gov/npdes/pubs/form_1.pdf>. The type of general facility information required by Form 1 is specified in §§ 122.21(a)(2)(i)(A) and 122.21(f) and includes the following:

- Name, mailing address, facility contact, and facility location.
- Standard industrial classification (SIC) code and a brief description of the nature of the business.
- Topographic map showing the location of the existing or proposed intake and discharge structures.

4.3.2 Form 2A: New and Existing POTWs

All new and existing POTWs must submit Form 2A <www.epa.gov/npdes/pubs/final2a.pdf>. EPA issued a final rule amending permit application requirements and application forms for POTWs and other TWTDS (64 FR 42433, August 4, 1999). The rule consolidated POTW application requirements, expanded toxic monitoring requirements for POTWs, and revised the forms used to submit permit applications. POTWs must also submit the form for permit renewals. Form 2A replaces Standard Form A and Short Form A.

POTWs with design influent flows equal to or greater than 100,000 gallons per day (gpd) (0.1 mgd) must submit Parts A, B, and C of Form 2A. POTWs with design flows of less than 100,000 gpd must submit Parts A and C of Form 2A. Parts A, B and C are referred to as Basic Application Information:

- Part A of Form 2A contains basic application information for all applicants:
  - Facility and applicant information.
  - Collection system type, areas served, and total population served.
  - Discharges and other disposal methods.
  - If the treatment works discharges effluent to waters of the United States, a description of outfalls, receiving waters, and treatment and effluent testing information.
- Part B of Form 2A collects additional information for applicants with a design flow greater than or equal to 0.1 mgd, including inflow and infiltration estimates, a topographic map, process flow diagram, and effluent testing data for additional parameters.
- Part C is a certification that all applicants must complete.

Form 2A also includes Supplemental Application Information (Parts D–G). POTWs complete these additional forms, as applicable, depending on the characteristics of the municipal discharge:

- Part D requests expanded effluent testing data for metals, volatile organic compounds, acid-extractable compounds, and base-neutral compounds. A POTW that discharges effluent to waters of the United States and meets one or more of the following criteria must complete Part D:
  - Has a design flow rate greater than or equal to 1 mgd.
  - Is required to have a pretreatment program (or has one in place).
  - Is otherwise required by the permitting authority to provide the information.

- A POTW that meets one or more of the following criteria must complete Part E (Toxicity Testing Data):
  - Has a design flow greater than or equal to 1 mgd.
  - Is required to have a pretreatment program (or has one in place).
  - Is otherwise required by the permitting authority to submit results of toxicity testing.
- A POTW that accepts process wastewater from any significant industrial users (SIUs) or receives Resource Conservation and Recovery Act (RCRA) or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or other remedial wastes must complete Part F. SIUs are defined as:
  - All industrial users subject to Categorical Pretreatment Standards under § 403.6 and 40 CFR Chapter I, Subchapter N.
  - Any other industrial user for which any of the following is true
    - Discharges an average of 25,000 gpd or more of process wastewater to the POTW (excluding sanitary, non-contact cooling, and boiler blowdown wastewater).
    - Contributes a process wastestream that makes up 5 percent or more of the average dry-weather hydraulic or organic capacity of the treatment plant.
    - Is designated an SIU by the control authority on the basis that it has a reasonable potential for adversely affecting the POTWs operation or for violating any pretreatment standard or requirement.
  - The control authority can determine that an industrial user subject to categorical pretreatment standards is a nonsignificant categorical industrial user, rather than an SIU, on a finding that it never discharges more than 100 gpd of total categorical wastewater and if:
    - Before that finding, the industrial user has consistently complied with all applicable categorical pretreatment standards and requirements.
    - The industrial user annually submits a certification statement required in § 403.12(q) and any information necessary to support the certification statement.
    - The industrial user never discharges any untreated concentrated wastewater.
  - If an industrial user meets one of the other criteria for determining that it is an SIU (i.e., discharges an average of 25,000 gpd of process wastewater), but the control authority finds that it has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standards or requirement, the control authority can determine that the industrial user is not an SIU.
- A POTW that has a combined sewer system must complete Part G. Information that must be provided in the section includes a system map and diagram, and descriptions of outfalls, combined sewer overflow (CSO) events, receiving waters, and operations.

4.3.3 Form 2S: New and Existing TWTDS

New TWTDS and TWTDS with effective NPDES permits must submit a new or renewal permit application, respectively, using new Form 2S <www.epa.gov/npdes/pubs/final2s.pdf>. Part 1 of Form 2S is to be completed by *sludge-only* facilities; that is, facilities that do not have, and are not applying for, an NPDES permit for a direct discharge to surface water. Part 1 collects background information on the facility, including identification information, quantities of sewage sludge handled, pollutant concentrations, treatment methods, and use and disposal information.

Part 2 is used by facilities that already have or are applying for an NPDES permit. It includes five sections:

- All applicants using Part 2 must complete the general information collected by **section A**.
- Applicants who either generate sewage sludge or derive a material from sewage sludge must complete **section B**.
- Applicants who either apply sewage sludge to the land or generate sewage sludge that is applied to the land by others (unless the sludge from the facility meets certain exemption criteria) must complete **section C**.
- Applicants who own or operate a surface disposal site must complete **section D**.
- Applicants who own or operate a sewage sludge incinerator must complete **section E**.

4.3.4 Form 2B: New and Existing Concentrated Animal Feeding Operations (CAFOs) and Concentrated Aquatic Animal Production (CAAP) Facilities

In addition to Form 1, owners of new and existing CAFOs (defined in § 122.23) and CAAP facilities (defined in § 122.24) must submit Form 2B <www.epa.gov/ne/npdes/2010RevisedCafoFedRegstrForm2b.pdf>. Form 2B was significantly modified as part of the final CAFO Rules (68 FR 7176, February 12, 2003, and 73 FR 70418, November 20, 2008). The type of information required by Form 2B consists of the following:

- For CAFOs
  - The name of the owner or operator.
  - The facility location and mailing addresses.
  - Latitude and longitude of the production area.
  - A topographic map of the geographic area in which the CAFO is located.
  - Specific information about the number and type of animals.
  - The type of containment and total capacity for storage (tons/gallons).
  - The total number of acres under control of the applicant available for land application.
  - Estimated amounts of manure, litter, and process wastewater generated and amounts transferred to other persons per year.
  - A nutrient management plan (NMP) that satisfies the requirements of § 122.42(e).
- For CAAP facilities
  - The maximum daily and average monthly flow from each outfall.
  - The number of ponds, raceways, and similar structures.
  - The name of the receiving water and the source of intake water.
  - For each species of aquatic animals, the total yearly and maximum harvestable weight.
  - The calendar month of maximum feeding and the total mass of food fed during that month.

Note that recent revisions to the NPDES regulations require that a CAFO seeking coverage under a permit submit its NMP with its application for an individual permit or notice of intent (NOI) to be authorized under a general permit. Permitting authorities are required to review the plan and provide the public with an opportunity for meaningful public review and comment. Permitting authorities also are required to incorporate terms of the NMP as NPDES permit conditions. For more information on the revisions to the CAFO regulations, see the Animal Feeding Operations Website <www.epa.gov/npdes/cafo>.

Sections 2.3.2.5 and 2.3.2.6 of this manual provide additional information on CAFOs and CAAP facilities, respectively.

4.3.5 Form 2C: Existing Manufacturing, Commercial, Mining, and Silvicultural Discharges

In addition to Form 1, operators of existing (i.e., currently permitted) manufacturing, commercial, mining, and silvicultural discharges must submit Form 2C <www.epa.gov/npdes/pubs/3510-2C.pdf>. The type of information required in Form 2C includes:

- Outfall locations.
- A line drawing of the water flow through the facility.
- Flow characteristics, sources of pollution, treatment technologies.
- Production information (if applicable).
- Improvements (if applicable).
- Intake and effluent characteristics for conventional, nonconventional and toxic (priority) pollutants.
- Potential discharges not covered by analysis.
- Biological testing data.
- Contract laboratory information.
- Certification and signature.

Quantitative effluent data requirements for existing industrial dischargers vary depending on the industrial category of the facility, the facility's discharge characteristics and the types of pollutants expected to be present in the discharge.

4.3.6 Form 2D: New Manufacturing, Commercial, Mining, and Silvicultural Discharges of Process Wastewater

In addition to Form 1, operators of new manufacturing, commercial, mining, and silvicultural discharges of process wastewater must submit Form 2D <www.epa.gov/npdes/pubs/3510-2D.pdf>. *New* dischargers are those that have not previously obtained permits for a discharge and have not commenced operation. The type of information required in Form 2D includes the following:

- Expected outfall locations.
- Date of expected commencement of discharge.
- Expected flow characteristics.
- Sources of pollutants.
- Treatment technologies.
- Production information (if applicable).
- Expected intake and effluent characteristics.

4.3.7 Form 2E: Manufacturing, Commercial, Mining, and Silvicultural Facilities that Discharge Only Non-Process Wastewater

In addition to Form 1, operators applying for an individual NPDES permit for manufacturing, commercial, mining, and silvicultural facilities that are not regulated by effluent limitations guidelines and standards (effluent guidelines) or new source performance standard, and that discharge only

non-process wastewaters, must submit Form 2E <www.epa.gov/npdes/pubs/3510-2E.pdf>. *Non-process wastewater* includes sanitary wastes, restaurant or cafeteria wastes, and non-contact cooling water, but it does not include stormwater. Stormwater is specifically excluded from the definition of non-process wastewater. Form 2E also may not be used for discharges by educational, medical, or commercial chemical laboratories or by POTWs. The type of information required in Form 2E includes the following:

- Outfall locations.
- Type of waste discharged.
- Effluent characteristics, including quantitative data for selected parameters.
- Flow characteristics.
- Treatment technologies.

4.3.8 Form 2F: Stormwater Discharges Associated with Industrial Activities

In addition to Form 1, operators applying for an individual NPDES permit for discharges composed entirely of stormwater associated with industrial activity must submit Form 2F <www.epa.gov/npdes/pubs/3510-2F.pdf>. Applicants whose discharge is composed of stormwater and non-stormwater must also submit Form 2C, 2D, or 2E as appropriate. The type of information required in Form 2F includes the following:

- A topographic map and estimates of impervious surface area.
- Descriptions of material management practices and control measures.
- A certification that outfalls have been evaluated for non-stormwater discharges.
- Descriptions of past leaks and spills.
- Analytical data from each outfall for several specified parameters.

EPA developed the *Guidance Manual For the Preparation of NPDES Permit Applications For Stormwater Discharges Associated With Industrial Activity*[1] <www.epa.gov/npdes/pubs/owm0241.pdf> to assist operators of facilities that discharge stormwater associated with industrial activity in complying with the requirements for applying for an NPDES permit.

4.3.9 Stormwater Discharges Associated with Construction Activity

Most stormwater discharges associated with construction activities that result in the disturbance of one acre or more are covered under a general permit issued by EPA or the authorized state. In cases that a general permit does not cover the discharge or the discharger decides that an individual permit is necessary for stormwater discharges associated with construction activity, the discharger is required to submit Form 1, along with a narrative description of the following:

- The location (including a map) and the nature of the construction activity.
- The total area of the site and the area of the site that is expected to undergo excavation during the life of the permit.
- Proposed measures, including best management practices (BMPs), to control pollutants in stormwater discharges during construction, including a brief description of applicable state and local erosion and sediment control requirements.

- Proposed measures to control pollutants in stormwater discharges that will occur after construction operations have been completed, including a brief description of applicable state or local erosion and sediment control requirements.
- An estimate of the runoff coefficient of the site and the increase in impervious area after the construction addressed in the permit application is completed, the nature of fill material and existing data describing the soil or the quality of the discharge.
- The name of the receiving water.

4.3.10 Stormwater Discharges from MS4s Serving a Population Greater than 100,000

The stormwater application regulations (55 FR 47990, November 16, 1990) require operators of large or medium MS4s to submit two-part applications. Part 1 application information was required to be submitted by large MS4s (serving a population greater than 250,000) by November 18, 1991, and by medium MS4s (serving a population greater than 100,000 but less than or equal to 250,000) by May 18, 1992. Part 2 application information was required to be submitted by large MS4s by November 16, 1992, and by medium MS4s by May 17, 1993. Those applications could be submitted on a system- or jurisdiction-wide basis. Key requirements of each part of the application include [and are further addressed in § 122.26(d)] the following:

- Part 1
  - General information (e.g., name, address).
  - Existing legal authorities to control discharges to the storm sewer system and any additional authority that might be required.
  - Source identification information (e.g., storm sewer outfalls, land use information).
  - Discharge characterization, including monthly precipitation estimates, average number of storm events, and results from dry-weather flow screening.
  - Characterization plan, including identification of 5 to 10 representative outfalls for stormwater sampling.
  - Description of existing stormwater management practices.
  - Descriptions of existing budget and resources available to complete Part 2 of the application and implement the stormwater program.
- Part 2
  - Demonstration of adequate legal authority.
  - Identification of any major storm sewer outfalls not included in Part 1 of the application.
  - Discharge characterization data from three representative storm events.
  - Proposed stormwater management program.
  - Assessment of controls, including expected reductions in pollutant loadings.
  - Fiscal analysis, including necessary capital and operation and maintenance expenditures for each year of the permit.

Under the NPDES regulations, permittees are required to reapply for a new NPDES permit before the expiration of their existing permit; however, in the case of stormwater permits for MS4s, Part 1 and Part 2 application requirements described above were intended only for the initial issuance of an MS4 permit and specific requirements for reapplication have not been defined in the regulations. On May 17, 1996, EPA issued a policy that sets forth a streamlined approach for reapplication requirements for operators of

MS4s (61 FR 41698, August 9, 1996) that allows municipalities to use recommended changes submitted in their fourth year annual report required under § 122.42(c)(2), as the principal component of their reapplication package. It also encourages changes to monitoring programs to make them appropriate and useful to stormwater management decisions. With the policy, EPA seeks to improve municipal stormwater management efforts by allowing municipalities to target their resources for the greatest environmental benefit.

4.3.11 Stormwater Discharges from Small MS4s

The application requirements for small MS4s are addressed in § 122.33. Most states have issued general permits for small MS4s; however, regulated small MS4s may seek authorization to discharge under an individual permit. The application requirements are different depending on whether the MS4 will implement a program under § 122.34 (i.e., a program that follows EPA's six minimum control measures) or a program that varies from § 122.34. EPA anticipates that most MS4s will follow the § 122.34 requirements.

Regulated small MS4s seeking an individual permit and wishing to implement a program under § 122.34 (the six minimum control measures) must submit an application to their NPDES permitting authority that includes the following:

- The information required under §§ 122.21(f) and 122.34(d).
- An estimate of square mileage served by the small MS4.
- Any additional information that the NPDES permitting authority requests.

A storm sewer map that satisfies the requirement of § 122.34(b)(3)(i) will also satisfy the map requirement in § 122.21(f)(7).

Regulated small MS4s seeking an individual permit and wishing to implement a program that is different from the program under § 122.34 must comply with the permit application requirements of § 122.26(d) (for additional information, see section 4.3.10 above). Under § 122.33, the regulated small MS4 is required to submit both parts of the application requirements in §§ 122.26(d)(1) and (2) by March 10, 2003. Small MS4s are not required to submit the information required by §§ 122.26(d)(1)(ii) and (d)(2) regarding their legal authority, unless they intend for the permit writer to take such information into account when developing their other permit conditions. Regulated small MS4s may jointly apply with another regulated entity consistent with the same requirements.

Additionally, another regulated entity may seek a modification of an existing MS4 permit to include a regulated small MS4 as a co-permittee. In such a case, the regulated small MS4 must apply consistent with § 122.26 rather than § 122.34. Application requirements of §§ 122.26(d)(1)(iii) and (iv) and (d)(2)(iii) do not apply and compliance with §§ 122.26(d)(1)(v) and (d)(2)(iv) can be met by referring to the other MS4's stormwater management program.

4.3.12 Cooling Water Intake Structures

Phase I of the CWA section 316(b) rule was finalized on December 18, 2001, in 66 FR 65256. The Phase I Rule (Part 125, Subpart I) implements CWA section 316(b) for most new facilities. The rule applies to new facilities that use cooling water intake structures to withdraw water from waters of the United States and that have or require an NPDES permit. This rule includes new facilities that have a design intake flow of greater than 2 mgd and that use at least 25 percent of water withdrawn for cooling purposes. For other

new facilities that have or require an NPDES permit but do not meet the 2-mgd intake flow threshold or use less than 25 percent of their water for cooling water purposes, the permit authority must implement CWA section 316(b) on a case-by-case basis, using best professional judgment (BPJ) (§§ 125.90(b) and 401.14).

Phase II of the CWA section 316(b) rule was finalized on July 9, 2004, in 69 FR 41576. In 2007 EPA suspended the rule following remand of a number of its provisions by the U.S. Court of Appeals for the Second Circuit. CWA section 316(b) requirements for such facilities must be developed on a case-by-case basis.

Phase III of the CWA section 316(b) rule was finalized on June 16, 2006, in 71 FR 35006. The Phase III rule (Part 125, Subpart N) implements CWA section 316(b) for new offshore oil and gas extraction facilities that use cooling water intake structures to withdraw water from waters of the United States and that have or require an NPDES permit. The rule includes facilities with a design intake flow of greater than 2 mgd and that use at least 25 percent of water withdrawn for cooling purposes.

EPA has not established national standards for existing Phase III facilities and is reevaluating its decisions in both Phase II and Phase III because of court remands. In the interim, for Phase III facilities not regulated under national categorical standards, the permitting authority must implement CWA section 316(b) on a case-by-case basis, using BPJ (§§ 125.90(b) and 401.14). For the most current information on regulatory requirements, see the Cooling Water Intake Structure Program Website <www.epa.gov/waterscience/316b/>.

4.4 Requirements for NPDES General Permits

As previously discussed in section 3.1.2 of this manual, general permits (§ 122.28) are permits developed for a specific category of dischargers within a specified geographic or political boundary. Using a general permit could simplify the permitting process for both EPA and the discharger. Owners/operators may seek coverage under a general permit only if one has been issued that is applicable to the type of facility for which coverage is sought and the permit covers the facility's activities. In addition, the permitting authority may determine that a general permit is not appropriate for a facility seeking coverage under the general permit and can require the facility to apply for an individual permit. Furthermore, a facility that otherwise qualifies for a general permit may opt to apply for an individual permit.

In most cases, a facility or activity seeking coverage under a general permit must seek coverage by submitting an NOI. The information that must be provided by the facility or activity in the NOI is specified in the general permit and must include, at a minimum, the following:

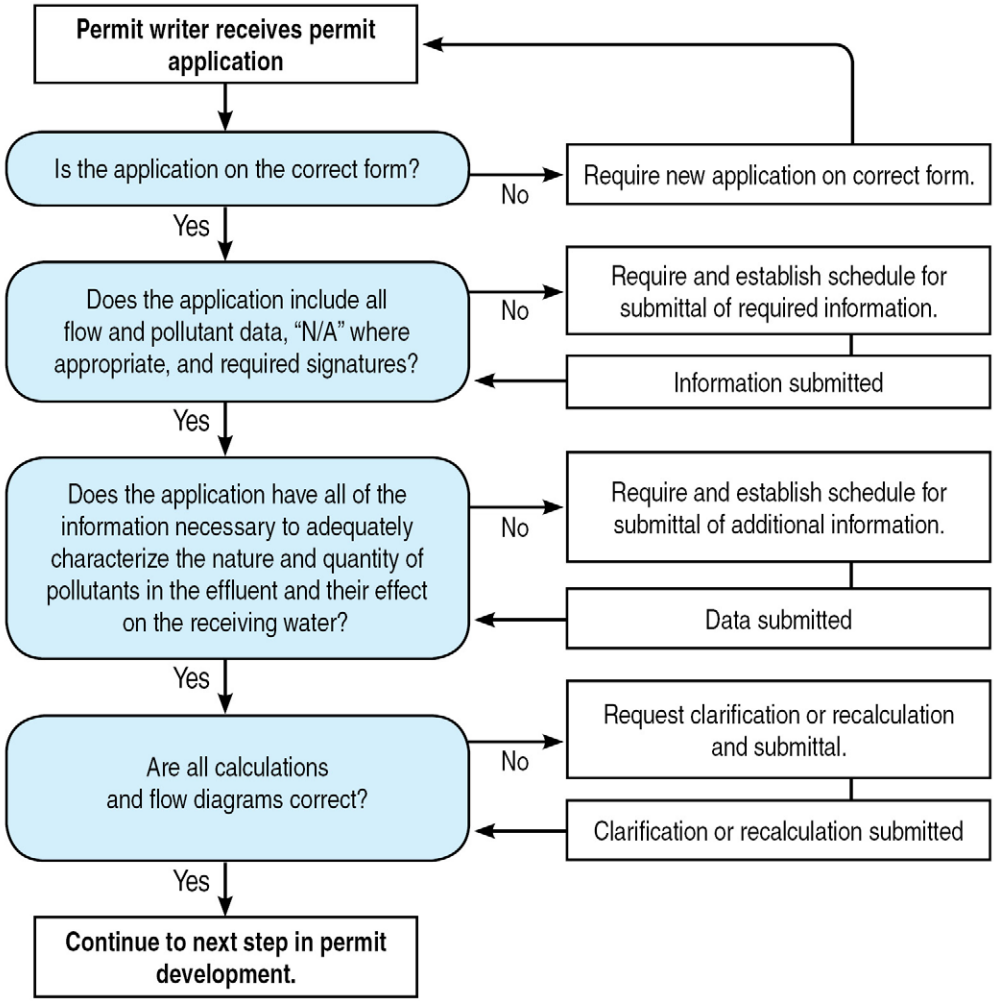
- Legal name and address of the owner or operator.
- Name and address of the facility.
- Type of facility or discharges.
- The receiving stream(s).

EPA has developed the Electronic NOI (eNOI) for construction sites and industrial facilities that need to apply for coverage under EPA's Construction General Permit (CGP) or Multi-Sector General Permit (MSGP), respectively. EPA's Electronic Stormwater Notice of Intent (eNOI) Website <www.epa.gov/npdes/stormwater/enoi> presents additional information about eNOI.

4.5 Application Review

The contents of individual NPDES permits are based, in part, on the information included in the application. Thus, the application must be complete and accurate before a permit writer can properly develop a permit. Exhibit 4-4 depicts the general process for reviewing a permit application, based on a chart provided in the *Washington Department of Ecology's Permit Writers' Manual*[2].

Exhibit 4-4 Permit application review process



After the initial application review, the permit writer may request that an applicant submit other information needed to decide whether to issue a permit and for permit development. The requested information could include the following:

- Additional information, quantitative data, or recalculated data.
- Submission of a new form (if an inappropriate form was used).
- Resubmission of the application (if incomplete or outdated information was initially submitted).

In some situations, a considerable amount of correspondence might be required before the permit writer obtains all the information that he or she believes is necessary to draft the permit.

4.5.1 The Complete Application

The regulations at § 122.21(e) state that the Director, "[must] not issue a permit before receiving a complete application..." At a minimum, the application form must have all applicable spaces filled in. Instructions for the application form state that all items must be completed and that applicants use the statement *not applicable* (N/A) to indicate that the item had been considered. Blanks on a form can occur for a number of reasons, such as the following:

- The response was inadvertently omitted.
- The applicant had difficulty determining the correct response and rather than provide misleading or incorrect information, left the space blank.
- The applicant was unwilling to provide the response.

A permit writer must obtain a response to the blank items by contacting the facility in writing or, in some cases, by telephone. Only minor changes should be handled by telephone and even minor items should be documented in writing in the permit file. Under no circumstances should a permit writer edit or modify the application, which is a legal document that has been signed and certified by the applicant. The original application, any subsequent clarifications, and any supplemental information provided by the applicant should be clearly identified in the file. The information will become part of the administrative record (§ 124.9) for the permit (see section 11.2.1 of this manual), which is critical if any legal challenges regarding permit decisions arise. If the changes or corrections to any application are extensive, the permit writer may require the permit applicant to submit a new application.

The permit writer may also require supplementary information, such as more detailed production information or maintenance and operating data for a treatment system, to process the permit. According to § 122.21(e), an application is considered complete when the permitting authority is satisfied that all required information has been submitted. Supplementary information also can be obtained later when the permit writer is actually drafting the permit. The applicant may submit additional information voluntarily or be required to do so under CWA section 308 or under a similar provision of state law.

4.5.2 Common Omissions in Applications

This section identifies some of the most common omissions and errors found in NPDES permit applications and provides examples of ways to identify missing information and verify the accuracy of certain data.

One of the most commonly omitted items from NPDES permit applications is a topographic map of the area around the discharge, which is required as an attachment to Form 1, Form 2A, and Form 2S. Other industry- or municipality-specific information is also often omitted. For example, industrial applicants sometimes fail to submit a line drawing of the water flow through the facility required by Part II-A of Form 2C. The line drawing is important for ensuring that the location and description of the outfalls and the description of processes (Parts I and II-B of Form 2C) provided by the applicant are accurate.

Sometimes applicants do not properly submit the effluent data necessary to characterize the facility. Below are some required data elements that are commonly omitted from permit applications:

- Valid whole effluent toxicity (WET) testing data, required from POTWs with design flows greater than 1 mgd or those with a pretreatment program. This requirement may be satisfied if the

expiring permit contains a requirement for effluent characterization of WET. The permit writer should note the use of this option on the fact sheet.

- Biosolids (sewage sludge) monitoring data; a description of biosolids use and disposal procedures; annual biosolids production volumes; and information on the suitability of the site and a description of the site management for land application sites from POTWs and other TWTDS. A land application plan is required for any sites not identified in the application.
- Expected toxics and other pollutants. Non-municipal dischargers categorized as *primary industries* have some mandatory testing requirements for toxic pollutants (see § 122.21, Appendix D, Table I and Table II and also listed in Application Form 2C).
- Production rates and flow data from industrial facilities that are subject to production- or flow-based effluent guidelines. Applicants must use units of measure corresponding to applicable effluent guidelines to allow calculation of effluent limitations.
- Appropriate sample types for all required pollutants and parameters being analyzed (Part 136) (see sections 8.1.4 and 8.3 of this manual for more information). For example, only grab samples or continuous monitoring may be used for pH, total residual chlorine, and temperature, and only grab samples may be used for total phenols and volatile organics.

Exhibit 4-5 presents three examples of the types of questions that the permit writer should consider to determine whether an application is complete.

Exhibit 4-5 Considerations for an application to be complete

Example 1:

A plastics processor submits Form 1 and Form 2C but fails to indicate *testing required* for any gas chromatograph/mass spectrometer (GC/MS) fractions in section V.C. of Form 2C and does not provide any data for these pollutants.

Question:
Did the applicant provide all the required data for the toxic organic pollutants in Form 2C?

Answer:
No. The plastics processor is required to indicate *testing required* (in the check box) and provide data from at least one sample for each pollutant in the volatile GC/MS fraction (Table 2C-2 in the application form instructions and § 122.21(g)(7)(v)(A) of the NPDES regulations).

Example 2:

A soap and detergent manufacturing facility in the liquid detergents subcategory submits Form 1 and Form 2C but marks thallium and beryllium as *believed absent* in section V.C. of Form 2C and did not provide any data for these pollutants.

Question:
Is it appropriate for this applicant to mark *believed absent* in this section of Form 2C?

Answer:
No. Although an applicant that manufactures liquid detergents is not expected to discharge thallium and beryllium, page 2C-3 of the application form instructions and § 122.21(g)(7)(v)(B) require testing for all listed metals by all applicants in a primary industry category, such as soap and detergent manufacturers. The indication of *believed absent* is incorrect. The applicant should have indicated *testing required* and provided the results of at least one sample per pollutant. Occasionally, unexpected contaminants could be present in a wastestream.

Exhibit 4-5 Considerations for an application to be complete (continued)

Example 3:
An integrated slaughterhouse and meat processing facility submits Form 1 and Form 2C and indicates that zinc is *believed absent* from its wastewater.

Question:
Is *believed absent* a proper indication for zinc for this wastewater?

Answer:
Possibly. After consulting the effluent guidelines development documents for the Meat and Poultry Products Point Source Category, the permit writer determines that metals, including zinc, are often used as feed additives and in sanitation products and might be present in the effluent, even though there are no effluent limitations specified for zinc in the applicable effluent guideline. The permit writer should contact the applicant and clarify whether zinc would be expected to be present in the discharge.

The comprehensive testing requirements that apply to the various categories of industry are designed to determine whether any contaminants (some expected, some unexpected) are present in significant quantities and to determine levels of pollutants that are known to be present. Exhibit 4-6 presents an example of how a permit writer makes the determination of pollutant data required in the application.

Exhibit 4-6 Example of required testing during application review

Consider the plastics processor and the liquid detergents manufacturer mentioned above, and answer the following questions:

Question:
What pollutant data are needed to characterize the industries above?
- For which toxic organic pollutants are they required to test?
- For which heavy metals are they required to test?
- Which metals would you expect to find in their wastewaters regardless of whether testing is required?

Answer:
The application form in Table 2C-2 and § 122.21(g)(7)(ii)(A) of the NPDES regulations require testing of the volatile GC/MS fraction by the plastics processor and the volatile, acid, and base/neutral fractions by the liquid detergent manufacturer. Page 2C-3 of the application instructions and § 122.21(g)(7)(ii)(B) require testing of all the metals listed in item V, Part C1 of the application form as well as cyanide and total phenols by both of these primary industry facilities. For information on which, if any, metals might be expected in wastewater discharged by these applicants, see the effluent guidelines development documents.

4.5.3 The Accurate Application

All information submitted on a permit application must be accurate. Although it might be difficult to detect certain inaccuracies, a number of common mistakes can be readily detected. When mistakes are detected, they must be corrected. Generally, any correction or edit to the application should be obtained from the applicant in writing and will become a part of the administrative record for the permit.

In most cases, errors in the application will be inadvertent because of the length and complexity of the form. Note, however, that the application certification statement indicates, "…that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." If the permit writer believes that falsification has occurred, he or she should refer the findings to the agency's enforcement staff.

Some of the most common mistakes on permit applications include failing to provide the correct long-term average and daily maximum values, reporting quantified values below known detection limits, and using misplaced decimal points or incorrect concentration units. Exhibit 4-7 presents three examples of the types of questions that the permit writer should consider while reviewing the permit application for accuracy. Additional guidance from EPA might be available to assist permit writers in reviewing applications for some of these common errors. For example, an August 23, 2007, memorandum *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits*[3] <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf> describes when a method for mercury is sufficiently sensitive for purposes of permit applications and monitoring under a permit. In the memorandum, EPA strongly recommends that a permitting authority determine that a permit application that lacks effluent data analyzed with a sufficiently sensitive EPA-approved method (such as Method 1631E) is incomplete unless and until the facility supplements the original application with data analyzed with such a method.

4.6 Facility Information Review

In addition to the submitted application form, the permit writer should assemble other information that could be used to develop permit limitations and conditions.

4.6.1 Permit File Review

Before developing the draft permit and fact sheet, the permit writer should assemble and review any additional background information on the facility. If the permit writer is reissuing an existing permit, much of the information should be available in the permit file. Such information would typically include

- The current permit.
- The fact sheet or statement of basis for the current permit.
- Discharge monitoring reports (DMRs).
- Compliance inspection reports.
- Engineering reports.
- Correspondence or information on changes in plant conditions, problems, and compliance issues.

Much of this information, particularly DMR data, is stored in automated data tracking systems such as

- Permit Compliance System (PCS) or state databases.
- Integrated Compliance Information System (ICIS)-NPDES <https://icis.epa.gov>.
- Online Tracking Information System (OTIS) <www.epa.gov/idea/otis/>.
- Envirofacts Warehouse <www.epa.gov/enviro/>.

The permit writer can check with other permit writers who have permitted similar types of facilities to see if there are any special considerations related to the type of facility to be permitted. A permit writer might also wish to discuss compliance issues, changes, or history of complaints with compliance personnel who conducted previous inspections of the facility or with permit writers for other media (e.g., air, solid waste). Examples of some other sources of information that the permit writer could use for permit development include the following:

- Receiving water quality data from databases such as the EPA STOrage and RETrieval database (STORET) <www.epa.gov/STORET/>.

Exhibit 4-7 Considerations for an application to be accurate

Example 1:

An industrial applicant provides a daily maximum effluent flow value of 50,000 gpd in its permit application Form 2C. However, a review of historical water usage records and an old permit application indicate estimated wastewater flows ranged from 100,000 to 150,000 gpd. The applicant had not instituted any water use reduction measures, significantly changed its process operations, or decreased its number of employees.

Question:
Are reported values consistent with historical information?

Answer:
No. An inspection of the facility revealed two separate water meters (one for sanitary and one for process water); the applicant had overlooked the sanitary meter. Further, the process water meter was found to be defective. Subsequent flow monitoring of the actual total wastestream recorded a flow of 125,000 gpd. A new water meter was installed, and concurrent wastestream flow monitoring and water meter readings resulted in the following water balances:

- **Water In** (based on both water meter readings):
  148,000 gpd (131,000 gpd process line and 17,000 gpd sanitary line).
- **Water Out** (based on effluent flow monitoring):
  125,000 gpd total treated effluent discharged to the receiving water.
  Evaporative and consumption losses were estimated at 23,000 gpd (15% of total water usage).

The permit writer should require the applicant to submit a signed and certified letter with the revised flow estimates and a new water balance diagram or submit a revised application.

Example 2:

An applicant reported its maximum daily flow as 1.2 mgd, the maximum daily suspended solids concentration as 23 milligrams per liter (mg/L), and the maximum daily mass discharge as 690 pounds per day (lbs/day).

Question:
Do the concentration, mass, and flow values correspond?

Discussion:
No. Even in the unlikely event that the maximum daily flow and the maximum daily concentration occurred on the same day, the mass discharged would be well below the reported value of 690 lbs/day. Using the calculation below, the mass discharge that corresponds to the solids concentration (23 mg/L) and flow (1.2 mgd) would be 230 lbs/day:

$$23 \text{ mg/L} \times 1.2 \text{ mgd} \times \underbrace{8.34 \text{ (lbs)(L)/(mg)(millions of gallons)}}_{\text{(conversion factor)}} = 230 \text{ lbs/day}$$

Because the applicant reported a maximum mass discharge of 690 lbs/day, a significant discrepancy is indicated. The permit writer should contact the applicant to resolve the discrepancy. The applicant should submit a signed and certified letter clarifying the correct maximum daily mass discharge of suspended solids or submit a revised application.

Example 3:

The results submitted in the application for total cyanide are all reported as < 1,000 micrograms per liter (µg/L). When asked, the applicant indicated that total cyanide was analyzed using EPA Method 335.3 (Color, Auto).

Question:
Do concentration values correspond with published method detection limits for the method used?

Answer:
No. EPA Method 335.3 for total cyanide has a published method detection limit (MDL) of 5 µg/L. The applicant should be able to quantify results for total cyanide at values well below 1,000 µg/L using this method. The applicant has most likely used Standard Method 4500-CN (titrimetric) for total cyanide, rather than the testing procedure indicated. If total cyanide is expected to be present in the discharge and would be of concern at effluent concentrations below 1,000 µg/L, the permit writer should require the applicant to retest for total cyanide using the more sensitive method and to submit the results in a signed, certified letter.

- Supporting documentation collected by EPA for effluent guidelines and categorical pretreatment standards for a variety of industrial categories.
- Reference textbooks and technical documents that provide information about manufacturing processes and wastestreams for specific industry categories, which are available from libraries such as
  - National Technical Information Service (NTIS) <www.ntis.gov>.
  - EPA libraries <www.epa.gov/natlibra/libraries.htm>.
  - Office of Water Resource Center (OWRC) <www.epa.gov/safewater/resource/>.
  - National Service Center for Environmental Publications (NSCEP) <www.epa.gov/ncepihom/>.
- Related environmental permits that could provide site-specific background information about the types of pollutants and wastestreams at a facility, including, for example
  - RCRA permits, which regulate the management of hazardous waste by owners and operators of treatment, storage, and disposal facilities.
  - Clean Air Act permits, which regulate the discharge of atmospheric pollutants.
- EPA's *Treatability Manual*[4], which is a five-volume guidance manual that provides detailed descriptions of industrial processes, potential pollutants from each process, appropriate treatment technologies, and cost estimating procedures.
- The Toxic Release Inventory (TRI) <www.epa.gov/tri/>, which is accessible on EPA's mainframe and through a public online service. The TRI contains information on more than 300 listed toxic chemicals released by specific facilities, including chemical identification, quantity of chemicals released to various environmental media, off-site waste transfer, and waste treatment and minimization information.

If the permit writer must address special conditions in a permit for a municipal discharger to develop or implement a pretreatment program or to address discharges other than the wastewater treatment plant discharge, he or she should obtain the information needed to develop these special conditions. For example, the permit writer might need information on pretreatment program implementation, combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), sewage sludge use or disposal, or stormwater discharges relevant to the facility. Such information is in

- Annual pretreatment reports, pretreatment compliance inspections and audits.
- CSO reports.
- Bypass notifications or SSO reports.
- Stormwater discharge applications or NOIs for a general permit.

4.6.2 Facility Site Visits

Facility site visits are an invaluable way to update information on manufacturing processes; obtain information about the facility's operations, equipment or management; and verify application information. A site visit also acquaints the permit writer with the people who will be operating under the permit and participating in the permit development process.

Site visits can also allow the permit writer to gain a better understanding of more complex facilities. Site visits are especially warranted if significant pollution control or treatment improvements will be required, if there have been frequent problems in complying with the existing permit, if there are known problems

with spills or leaks or with contaminated surface runoff, or if there are other unique on-site activities that could affect the characteristics of the discharge from the facility.

The site visit should include a detailed review of production processes to evaluate the types of toxic or hazardous substances that might be present in raw materials, products, and by-products. The permit writer should review the water uses, the resulting wastewater streams, and any in-process pollution controls. This review is needed to assist in selecting toxic and other pollutants to be limited and in evaluating possible in-process control improvements.

In addition, the site visit should include a review of the performance and operation and maintenance practices of wastewater treatment facilities. The review is useful in evaluating the adequacy of existing treatment performance and assessing the feasibility of improvements in performance. The permit writer should examine effluent monitoring points, sampling methods, and analytical techniques to identify any needed changes to monitoring requirements and to evaluate the quality of DMR data.

Raw material and product storage and loading areas, sludge storage and disposal areas, hazardous waste management facilities, including on-site disposal areas, and all process areas should be observed to determine the need for controls on surface runoff and specific BMPs. Information from other environmental programs (e.g., CERCLA or RCRA) might be important in this regard.

While on-site, the permit writer should note any housekeeping problems or the need for spill prevention actions, which are not usually detectable from permit applications. If allowed, photographs of problem areas should be taken for future use during permit preparation. If necessary, the permit writer should meet with management to ask questions or clarify information provided on the permit application. If any inaccuracies in the application were found because of the site visit, that is the time for the permit writer to request corrected information.

The time required to conduct a site visit will vary according to the complexity of the facility. For facilities with only a few basic processes, one main waste treatment system, limited in-process controls, few surface runoff outfalls, and limited on-site management of sludge or hazardous wastes, an adequate site visit can most likely be completed in one day. Visits to complex, larger plants with several treatment systems, numerous outfalls, and extensive ancillary activities may require several days.

Time spent on site visits often results in time savings during permit preparation. However, time and travel resources might not be adequate to allow visits to all facilities to be permitted. In such cases, the permit writer might be able to obtain much of the desired information from facility compliance inspections and should try to coordinate the timing of compliance inspections with the timing of permit development.

Aerial photographs may provide much of the needed information on the potential for contamination of surface runoff and on ancillary activities without a site visit or inspection. In addition, comparing aerial photographs with site and process diagrams provided with the application can provide the permit writer with a complete visual description of the facility. Aerial photographs are available from a variety of sources, including the U.S. Geological Survey Earth Resources Observation and Science Center <eros.usgs.gov/#/Find_Data>; TerraServer <www.terraserver.com>; Google Earth <earth.google.com>; and other private contractors.

4.7 Confidential Information

In accordance with Part 2, information submitted to EPA pursuant to the NPDES permitting regulations under Part 122 may be claimed as confidential; however, EPA has determined that the following information will not be held confidential (§ 122.7):

- Name and address of the applicant.
- Permit applications and information submitted with applications.
- Permits.
- Effluent data.

Information that may be claimed as confidential includes material related to manufacturing processes unique to the applicant, or information that might adversely affect the competitive position of the applicant if released to the public. Under such circumstances, the permit writer will be required to treat the information as confidential in accordance with the requirements in Part 2. Any claims of confidentiality must be made at the time of submission or the information will not be considered confidential.

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[1] U.S. Environmental Protection Agency. 1991. *Guidance Manual For the Preparation of NPDES Permit Applications For Stormwater Discharges Associated With Industrial Activity.* EPA-505/8-91-002. U.S. Environmental Protection Agency, Office of Water, Washington DC, <www.epa.gov/npdes/pubs/owm0241.pdf>.

[2] Bailey, Gary. 2008. *Water Quality Program Permit Writer's Manual*. Publication Number 92-109. Washington State Department of Ecology, Water Quality Program, Olympia, WA. <www.ecy.wa.gov/pubs/92109.pdf>

[3] Hanlon, James A. 2007. *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, August 23, 2007. <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

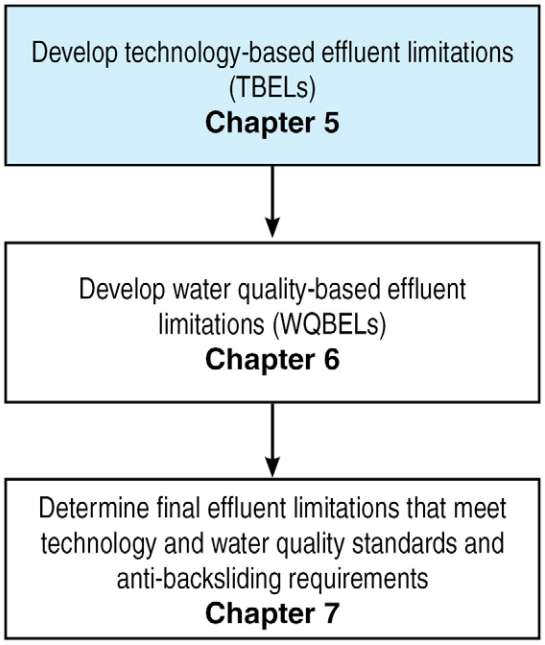
[4] U.S. Environmental Protection Agency. 1980. *Treatability Manual: Vol. I. Treatability Data* (EPA-600/8-80-042a) publications available on NEPIS Website <www.epa.gov/nscep/> as document 600880042A*; Vol. II. Industrial Descriptions* (EPA-600/8-80-042b) as document 600880024B*; Vol. III. Technologies* (EPA-600/8-80-042c) as document 600880024C*; Vol. IV. Cost Estimating* (EPA-600/8-80-042d) as document 600880042d; *Vol. V. Summary* (EPA-600/8-80-042e) as document 600880024E. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC.

CHAPTER 5. Technology-Based Effluent Limitations

One of the major strategies of the Clean Water Act (CWA) in making "reasonable further progress toward the national goal of eliminating the discharge of all pollutants" is to require effluent limitations based on the capabilities of the technologies available to control those discharges. Technology-based effluent limitations (TBELs) aim to prevent pollution by requiring a minimum level of effluent quality that is attainable using demonstrated technologies for reducing discharges of pollutants or pollution into the waters of the United States. TBELs are developed independently of the potential impact of a discharge on the receiving water, which is addressed through water quality standards and water quality-based effluent limitations (WQBELs). The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 125.3(a) require NPDES permit writers to develop technology-based treatment requirements, consistent with CWA section 301(b), that represent the minimum level of control that must be imposed in a permit. The regulation also indicates that permit writers must include in permits additional or more stringent effluent limitations and conditions, including those necessary to protect water quality. As described in Chapter 7 of this manual, the permit writer might also need to apply anti-backsliding requirements to determine the final effluent limitations for the NPDES permit.

This chapter discusses development of TBELs for publicly owned treatment works (POTWs) and industrial (non-POTW) dischargers. Chapter 6 discusses development of WQBELs. Exhibit 5-1 illustrates the relationship between TBELs and WQBELs in an NPDES permit and the determination of final effluent limitations.

Exhibit 5-1 Developing effluent limitations



5.1 Technology-based Effluent Limitations for POTWs

The largest category of dischargers requiring individual NPDES permits is POTWs. The federal regulations at § 403.3(q) define a POTW as a treatment works (as defined in CWA section 212) that is owned by a state or municipality [as defined in CWA section 502(4)]. Under § 403.3(q), that definition includes "any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature." The definition also includes "sewers, pipes, and other conveyances only if they convey wastewater to a POTW Treatment Plant," as defined in § 403.3(r). Under § 403.3(q), the term POTW "also means the municipality as defined in section 502(4) of the Act, which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works."

CWA section 304(d) required the U.S. Environmental Protection Agency (EPA) to publish information on the degree of effluent reduction attainable through the application of secondary treatment. Under CWA section 301(b)(1)(B), in general, POTWs in existence on July 1, 1977, were required to meet discharge limitations based on secondary treatment (or any more stringent limitations established under state law, including those necessary to meet state water quality standards). On the basis of those statutory provisions, EPA developed secondary treatment regulations, which are specified in Part 133. Later amendments to CWA section 304(d) called for EPA to develop alternative standards for certain types of POTWs. Those standards are referred to as "equivalent to secondary treatment" standards.

5.1.1 Secondary and Equivalent to Secondary Treatment Standards

Several regulations implement the statutory requirements for developing standards and discharge limitations based on secondary treatment. EPA has promulgated regulations in Part 133 establishing secondary treatment standards, equivalent to secondary treatment standards, and a number of special considerations applied on a case-by-case basis. In addition, § 122.44(a)(1) requires that NPDES permits include applicable technology-based limitations and standards, while regulations at § 125.3(a)(1) state that TBELs for POTWs must be based on secondary treatment standards (which includes the "equivalent to secondary treatment standards") specified in Part 133.

5.1.1.1 Secondary Treatment Standards

In Part 133, EPA published secondary treatment standards based on an evaluation of performance data for POTWs practicing a combination of physical and biological treatment to remove biodegradable organics and suspended solids. The regulation applies to all POTWs and identifies the technology-based performance standards achievable based on secondary treatment for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. Exhibit 5-2 summarizes the standards.

Exhibit 5-2 Secondary treatment standards

Parameter	30-day average	7-day average
BOD_5	30 mg/L (or 25 mg/L $CBOD_5$)	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
BOD_5 and TSS removal (concentration)	not less than 85%	--
pH	within the limits of 6.0–9.0*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

mg/L = milligrams per liter

The regulation also includes an alternate set of standards that apply to certain facilities employing waste stabilization ponds or trickling filters as the principal process. Those standards are called equivalent to secondary treatment standards.

5.1.1.2 Equivalent to Secondary Treatment

Some biological treatment technologies, such as trickling filters or waste stabilization ponds, are capable of achieving significant reductions in BOD_5 and TSS but might not consistently achieve the secondary treatment standards for these parameters. Congress recognized that unless alternate limitations were set for facilities with trickling filters or waste stabilization ponds, which often are in small communities, such facilities could be required to construct costly new treatment systems to meet the secondary treatment standards even though their existing treatment technologies could achieve significant biological treatment. To prevent requiring upgrades where facilities were achieving their original design performance levels, Congress included provisions in the 1981 amendments to the Clean Water Act Construction Grants program (*Public Law 97-117, Section 23*) that required EPA to make allowances for alternative biological treatment technologies, such as a trickling filters or waste stabilization ponds. In response to that requirement, in 1984, EPA promulgated regulations at § 133.105 that include alternative standards that apply to facilities using "equivalent to secondary treatment." A facility must meet the criteria in § 133.101(g) to qualify for application of those alternative standards.

Equivalent to Secondary Standards

The equivalent to secondary treatment standards, as specified in § 133.105, are shown in Exhibit 5-3.

Exhibit 5-3 Equivalent to secondary treatment standards

Parameter	30-day average	7-day average
BOD_5	not to exceed 45 mg/L (or not to exceed 40 mg/L $CBOD_5$)	not to exceed 65 mg/L (or not to exceed 60 mg/L $CBOD_5$)
TSS	not to exceed 45 mg/L	not to exceed 65 mg/L
BOD_5 and TSS removal (concentration)	not less than 65%	--
pH	within the limits of 6.0–9.0*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

Criteria to Qualify for Equivalent to Secondary Standards

To be eligible for discharge limitations based on equivalent to secondary standards, a POTW must meet all three of the following criteria:

Criterion #1—Consistently Exceeds Secondary Treatment Standards: The first criterion that must be satisfied to qualify for the equivalent to secondary standards is demonstrating that the BOD_5 and TSS effluent concentrations consistently achievable through proper operation and maintenance of the treatment works exceed the secondary treatment standards set forth in §§ 133.102(a) and (b). The regulations at § 133.101(f) define "effluent concentrations consistently achievable through proper operation and maintenance" as

- (f)(1): For a given pollutant parameter, the 95th percentile value for the 30-day average effluent quality achieved by a treatment works in a period of at least 2 years, excluding values attributable to upsets, bypasses, operational errors, or other unusual conditions.
- (f)(2): A 7-day average value equal to 1.5 times the value derived under paragraph (f)(1).

Some facilities might meet this criterion only for the BOD_5 limitations or only for the TSS limitations. EPA believes that it is acceptable for the permit writer to adjust the limitations for only one parameter (BOD_5 or TSS) if the effluent concentration of only one of the parameters is demonstrated to consistently exceed the secondary treatment standards.

Criterion #2—Principal Treatment Process: The second criterion that a facility must meet to be eligible for equivalent to secondary standards is that its principal treatment process must be a trickling filter or waste stabilization pond (i.e., the largest percentage of BOD and TSS removal is from a trickling filter or waste stabilization pond system).

Criterion #3—Provides Significant Biological Treatment: The third criterion for applying equivalent to secondary standards is that the treatment works provides significant biological treatment of municipal wastewater. The regulations at § 133.101(k) define *significant biological treatment* as using an aerobic or anaerobic biological treatment process in a treatment works to consistently achieve a 30-day average of at least 65 percent removal of BOD_5.

A permit writer should consider each facility on a case-by-case basis to determine whether it meets those three criteria. To apply the criteria, the permit writer should assemble enough influent, effluent, and flow data from the facility to adequately characterize the facility's performance or require the discharger to provide an appropriate analysis. If the facility has made substantial changes in its operations or treatment processes during the current permit term, the permit writer, using his or her best professional judgment (BPJ), may elect to use data for a period that is representative of the discharge at the time the permit is being drafted. Facilities that do not meet all three criteria do not qualify as equivalent to secondary treatment facilities. For such facilities, the secondary treatment standards apply. EPA noted in its December 1985 *Draft Guidance for NPDES Permits and Compliance Personnel—Secondary Treatment Redefinition*[1] that a treatment works operating beyond its design hydraulic or organic loading limit is not eligible for application of equivalent to secondary standards. If overloading or structural failure is causing poor performance, the solution to the problem is construction, not effluent limitations adjustment.

5.1.2 Adjustments to Equivalent to Secondary Standards

In addition to providing secondary treatment standards and equivalent to secondary treatment standards, the federal regulations allow states to make adjustments to the standards and to apply those adjusted standards on a case-by-case basis.

5.1.2.1 Adjusted TSS Requirements for Waste Stabilization Ponds

In accordance with regulations adopted by EPA in 1977 and revised in 1984, states can adjust the maximum allowable TSS concentration for waste stabilization ponds upward from those specified in the equivalent to secondary treatment standards to conform to TSS concentrations achievable with waste stabilization ponds. The regulation, found at § 133.103(c), defines "SS concentrations achievable with waste stabilization ponds" as the effluent concentration achieved 90 percent of the time within a state or

appropriate contiguous geographical area by waste stabilization ponds that are achieving the levels of effluent quality for BOD_5 specified in § 133.105(a)(1) (45 milligrams per liter [mg/L] as a 30-day average). To qualify for an adjustment up to as high as the maximum concentration allowed, a facility must use a waste stabilization pond as its principal process for secondary treatment and its operations and maintenance data must indicate that it cannot achieve the equivalent to secondary standards. EPA has published approved alternate TSS requirements in 49 *Federal Register* (FR) 37005, September 20, 1984. Exhibit 5-4 is a summary from the FR notice of the adjusted TSS requirements for each state.

Exhibit 5-4 State-specific adjusted TSS requirements*

Location	Alternate TSS limitation (30-day average) (mg/L)	Location	Alternate TSS limitation (30-day average) (mg/L)
Alabama	90	Nebraska	80
Alaska	70	North Carolina	90
Arizona	90	North Dakota	
Arkansas	90	• North and east of Missouri R.	60
California	95	• South and west of Missouri R.	100
Colorado		Nevada	90
• Aerated ponds	75	New Hampshire	45
• All others	105	New Jersey	None
Connecticut	None	New Mexico	90
Delaware	None	New York	70
District of Columbia	None	Ohio	65
Florida	None	Oklahoma	90
Georgia	90	Oregon	
Guam	None	• East of Cascade Mountains	85
Hawaii	None	• West of Cascade Mountains	50
Idaho	None	Pennsylvania	None
Illinois	37	Puerto Rico	None
Indiana	70	Rhode Island	45
Iowa		South Carolina	90
• Controlled discharge, 3 cell	Case-by-case but not greater than 80	South Dakota	120
• All others	80	Tennessee	100
Kansas	80	Texas	90
Kentucky	None	Utah	None
Louisiana	90	Vermont	55
Maine	45	Virginia	
Maryland	90	• East of Blue Ridge Mountains	60
Massachusetts	None	• West of Blue Ridge Mountains	78
Michigan: Controlled seasonal discharge		• East slope counties: Loudoun, Fauquier, Rappahannock, Madison, Green, Albemarle, Nelson, Amherst, Bedford, Franklin, Patrick.	Case-by-case application of 60/78 limits
• Summer	70	Virgin Islands	None
• Winter	40	Washington	75
Minnesota	40	West Virginia	80
Mississippi	None	Wisconsin	80
Missouri	80	Wyoming	100
Montana	100	Trust Territories and N. Marianas	None

* (49 FR 37005, September 20, 1984)

5.1.2.2 Alternative State Requirements (ASRs)

To further address the potential variations in facility performance arising from geographic, climatic, or seasonal conditions in different states, the revised secondary treatment regulations (adopted in 1984) also included provisions in § 133.105(d) for ASRs. The ASR provisions give states flexibility to modify the maximum allowable concentrations of both BOD_5 and TSS for trickling filter facilities and for BOD_5 for waste stabilization pond facilities. ASRs are set at levels consistently achievable through proper operation and maintenance [§ 133.101(f)] by the median facility in a representative sample of facilities within a state or appropriate continuous geographical area that meet the definition of facilities eligible for treatment equivalent to secondary treatment. Qualifying facilities are eligible to receive limitations up to the concentrations specified by the ASRs.

5.1.3 Applying Secondary Treatment Standards, Equivalent to Secondary Treatment Standards, and Adjusted Standards

Determining whether secondary treatment standards or equivalent to secondary standards apply to a POTW and determining the specific discharge limitations for the facility based on either set of standards and any other special considerations that might apply can be a complex process. Permit writers should remember that compliance with limitations must be measurable and percent removal limitations require influent monitoring (for more on establishing monitoring conditions, see section 8.1 of this manual). This section presents a step-by-step procedure to establishing technology-based effluent limitations for POTWs as shown in Exhibit 5-5.

Exhibit 5-5 Steps to establish technology-based discharge limitations for POTWs

Step 1.	Determine whether secondary treatment standards or equivalent to secondary treatment standards or adjusted standards apply
Step 2.	Calculate effluent limitations based on secondary treatment standards or
Step 3.	Calculate effluent limitations based on equivalent to secondary standards or
Step 4.	Calculate effluent limitations based on adjusted standards
Step 5.	Apply special considerations for further adjustments
Step 6.	Document the application of secondary or equivalent to secondary treatment standards or adjusted standards and all special considerations in the fact sheet

5.1.3.1 Step 1: Determine Whether Secondary Treatment Standards or Equivalent to Secondary Treatment Standards or Adjusted Standards Apply

The first step for permit writers to develop TBELs for municipal dischargers is to determine whether secondary treatment standards (discussed in section 5.1.1 above), equivalent to secondary standards (discussed in section 5.1.1.2 above), or some adjustments to the equivalent to secondary standards (discussed in section 5.1.2 above) apply to the POTW.

An important consideration for permitting authorities is how to treat new POTW discharges that use a waste stabilization pond or trickling filter, or a combination of the two. New facilities or new discharges from trickling filters or waste stabilization ponds often are capable of achieving secondary treatment standards. In the preamble to the secondary treatment regulation (49 FR 37002, September 20, 1984) and in § 133.105(f)(2), EPA noted that when developing permits for new trickling filter and waste

stabilization pond facilities, permitting authorities should consider the ultimate design capability of the treatment process, geographical and climatic conditions, and the performance capabilities of recently constructed facilities in similar situations.

After determining whether secondary treatment standards or equivalent to secondary treatment standards apply to a facility or a discharge, the permit writer applies the appropriate standards to develop effluent limitations. Section 5.1.3.2 below (Step 2) details development of effluent limitations for facilities or discharges where secondary treatment standards apply; section 5.1.3.3 below (Step 3) details development of limitations for facilities that qualify for equivalent to secondary standards; and section 5.1.3.4 below (Step 4) details development of limitations for facilities where adjusted standards apply. It is possible that a facility with multiple biological treatment processes could have limitations based on a combination of the standards (see section 5.1.3.5 below [Step 5]); therefore, those sections are presented as separate steps.

5.1.3.2 Step 2: Calculate Effluent Limitations Based on Secondary Treatment Standards

If the facility being permitted is subject to the secondary treatment standards, the permit writer should complete Step 2. Otherwise, he or she should move to Step 3 in section 5.1.3.3 below.

Applying the secondary treatment standards in NPDES permits is straightforward. Where secondary treatment standards apply, the permit should include effluent limitations in the permit as presented in Exhibit 5-6 below, consistent with the secondary treatment standards and the regulatory requirements in § 122.45(d)(2).

Exhibit 5-6 Effluent limitations calculated from secondary treatment standards

Parameter	Average monthly limitation	Average weekly limitation
BOD_5	30 mg/L (or 25 mg/L $CBOD_5$)	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
BOD_5 and TSS removal (concentration)	not less than 85%	N/A
pH	Within the range of 6.0–9.0 standard units at all times (or expressed as instantaneous minimum and maximum limitations)*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

Certain provisions in the EPA regulations warrant some clarification.

First, the secondary treatment standards are stated as 30-day and 7-day averages, whereas § 122.45(d)(2) requires that effluent limitations for POTWs be expressed, unless impracticable, as average monthly and average weekly limitations. The NPDES regulations in § 122.2 define average monthly and average weekly limitations on a calendar period basis. Therefore, EPA recommends that permit writers apply the 30-day and 7-day average secondary treatment standards directly as average monthly (calendar month) and average weekly (calendar week) discharge limitations.

Second, § 122.45(f)(1) requires that all permit limitations, standards, or prohibitions be expressed in terms of mass except in any of the following cases:

- For pH, temperature, radiation or other pollutants that cannot appropriately be expressed by mass limitations.

- When applicable standards and limitations are expressed in terms of other units of measure.
- If in establishing permit limitations on a case-by-case basis under § 125.3, limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation, and permit conditions ensure that dilution will not be used as a substitute for treatment.

The first condition applies to pH requirements established by secondary treatment standards. In addition, because the 30-day and 7-day average requirements for BOD_5 and TSS, including percent removal, are expressed in terms of concentration, the second condition applies to the standards. Thus, mass-based discharge limitations are not specifically required to implement secondary treatment standards; however, permit writers can choose to include mass-based limitations in a permit. In general, regulations at § 122.45(b)(1) require using the design flow rate of the POTW to calculate limitations. To calculate a mass-based limitation for a POTW (in pounds per day [lbs/day]) a permit writer would use the equation and follow the example calculations in Exhibit 5-7.

Exhibit 5-7 POTW mass based limitation calculation equation and example calculations

POTW design flow in million gallons per day (mgd)	x	**Concentration-based limitation** in milligrams per liter (mg/L)	x	**Conversion factor** 8.34 with units of (lbs)(L) / (mg)(millions of gallons)

A POTW with a design flow of 2.0 mgd would have mass-based limitations calculated from secondary treatment standards as follows:

Mass-based limitation*	=	**POTW design flow** x **Concentration-based limitation** x **Conversion factor**		
BOD_5				
Average monthly	=	2.0 mgd x 30 mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**500 lbs/day**
Average weekly	=	2.0 mgd x 45 mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**750 lbs/day**
TSS				
Average monthly	=	2.0 mgd x 30mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**500 lbs/day**
Average weekly	=	2.0 mgd x 45mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**750 lbs/day**

* calculated to 2 significant figures

5.1.3.3 Step 3: Calculate Effluent Limitations Based on Equivalent to Secondary Standards

If a facility being permitted is subject to the equivalent to secondary standards without any further adjustments by the state (e.g., ASRs), the permit writer should complete Step 3. Otherwise, he or she should move to Step 4 in section 5.1.3.4 below.

For facilities that qualify for equivalent to secondary standards, effluent limitations must meet the requirements specified in § 133.105 and summarized above in Exhibit 5-3 (not accounting for any further approved adjustments). It is important to note that the equivalent to secondary standards specify the maximum allowable discharge concentration of BOD_5 and TSS and a minimum percent removal requirement for qualified facilities. The regulations at § 133.105(f) require a permitting authority to include more stringent limitations when it determines that the 30-day average and 7-day average BOD_5 and TSS concentrations are achievable through proper operation and maintenance of the treatment works

(based on an analysis of the past performance for an existing facility or considering the design capability of the treatment process and geographical and climatic conditions for a new facility) would enable the treatment works to achieve more stringent limitations than the least stringent effluent quality allowed by the equivalent to secondary standards. As noted above, the regulations at § 133.101(f) define, "effluent concentrations consistently achievable through proper operation and maintenance" as the 95th percentile value for the 30-day average effluent quality achieved by a treatment works in a period of at least 2 years, excluding values attributable to upsets, bypasses, operational errors, or other unusual conditions. The 7-day average value is set equal to 1.5 times the 30-day average value.

If an existing facility does not have sufficient data to establish past performance, the permit writer could include the limitations from the previous permit in the new permit and require monitoring to generate the necessary data. In addition, the permit writer could choose to include a provision allowing the permitting authority to reopen and, if necessary, modify the permit after reviewing the additional data collected by the discharger.

As with limitations based on secondary treatment standards (shown in Exhibit 5-6 above), limitations based on equivalent to secondary standards are expressed as average monthly (calendar month) and average weekly (calendar week) limitations. Mass-based limitations can be calculated using the procedures outlined above.

5.1.3.4 Step 4: Calculate Effluent Limitations Based on Adjusted Standards

If a facility being permitted is subject to the adjusted standards as described in section 5.1.2 above, the permit writer should complete Step 4. Otherwise, he or she should move to section 5.1.3.5 below (Step 5).

As discussed in sections 5.1.2.1 and 5.1.2.2 above, the federal regulations at § 133.103(c) allow states to adjust the maximum allowable discharge concentration of TSS for waste stabilization ponds upward from what would otherwise be required by the equivalent to secondary standards, and the regulations at § 133.105(d) give states flexibility to adopt ASRs that modify equivalent to secondary requirements for both BOD_5 and TSS for trickling filter facilities and BOD_5 requirements for waste stabilization pond facilities. Where one or more of the adjusted standards apply, average monthly limitation(s) generally should be set at the lower of the following:

- The 30-day average concentration of the pollutant that could be achievable through proper operation and maintenance of the treatment works.
- The maximum concentration of the pollutant that would be allowed under the adjusted standard.

Permit writers should note, however, that if the state has developed an adjusted TSS standard for waste stabilization ponds consistent with § 133.103(c), the regulations would allow uniform application of that standard to POTWs where waste stabilization ponds are the principal process used for secondary treatment and operation and maintenance data indicate that the equivalent to secondary treatment standards for TSS cannot be achieved.

The average weekly limitation can be set equal to 1.5 times the average monthly limitation and mass-based limitations may be calculated using the procedures outlined above.

5.1.3.5 Step 5: Apply Special Considerations for Further Adjustments

Part 133 allows a permit writer to make further adjustments when calculating effluent limitations derived from secondary treatment standards or equivalent to secondary standards based on several special considerations. The permit writer should determine whether any of the special considerations outlined in this section apply and, as appropriate, make any further adjustments to the concentration limitations or percent removal requirements. The calculated limitations, after making such adjustments, are the final technology-based effluent limitations for the POTW.

Substitution of $CBOD_5$ for BOD_5

Wastewater contains carbonaceous oxygen demanding substances and nitrogenous oxygen demanding substances. A $CBOD_5$ test measures the 5-day carbonaceous biochemical oxygen demand while the BOD_5 test measures the both carbonaceous biochemical oxygen demand and nitrogenous biochemical oxygen demand. During nitrification, nitrifying bacteria use a large amount of oxygen to consume nitrogenous oxygen demanding substances (unoxidized nitrogen and ammonia-nitrogen) and convert these to oxidized nitrate. For wastewaters with significant nitrogen content, basing permit limitations on $CBOD_5$ instead of BOD_5 eliminates the impact of nitrification on discharge limitations and compliance determinations. EPA recognizes that the $CBOD_5$ test can provide accurate information on treatment plant performance in many cases and, in Part 133, allows permit writers to use $CBOD_5$ limitations in place of BOD_5 limitations to minimize false indications of poor facility performance as a result of nitrogenous oxygen demand.

EPA has established $CBOD_5$ standards for cases where secondary treatment standards or equivalent to secondary treatment standards are applied:

- **Secondary Treatment:** The $CBOD_5$ secondary treatment performance standards specified by the regulations are as follows:
  - 25 mg/L as a 30-day average.
  - 40 mg/L as a 7-day average.
- The EPA-approved test procedures in Part 136 include a $CBOD_5$ (nitrogen inhibited) test procedure. Subject to any state-specific requirements, a permit writer can specify these $CBOD_5$ limitations along with $CBOD_5$ monitoring requirements in any POTW permit requiring performance based on secondary treatment standards [§ 133.102(a)(4)].
- **Equivalent to Secondary Treatment:** The $CBOD_5$ equivalent to secondary treatment performance standards specified by the regulations are as follows:
  - No greater than 40 mg/L as a 30-day average.
  - No greater than 60 mg/L as a 7-day average.
- Where data are available to establish $CBOD_5$ limitations, and subject to any state-specific requirements, a permit writer may substitute $CBOD_5$ for BOD_5 and specify $CBOD_5$ limitations and monitoring requirements when applying equivalent to secondary standards.

Substitution of COD or TOC for BOD_5

Chemical oxygen demand (COD) and total organic carbon (TOC) laboratory tests can provide an accurate measure of the organic content of wastewater in a shorter time frame than a BOD_5 test (i.e., several hours versus five days). The regulations at § 133.104(b) allow a permit writer to set limitations for COD or TOC instead of BOD_5 if a long-term BOD_5:COD or BOD_5:TOC correlation has been demonstrated.

Adjustments for Industrial Contributions

Under § 133.103(b), treatment works receiving wastes from industrial categories with effluent limitations guidelines and standards (effluent guidelines) requirements or new source performance standards for BOD_5 or TSS, which are less stringent than the secondary treatment standards or, if applicable, the equivalent to secondary treatment standards in Part 133, can qualify to have their 30-day BOD_5 or TSS limitations adjusted upward provided that the following are true:

- The adjusted 30-day limitations are not greater than the limitations in effluent guidelines or new source performance standards, as applicable, for the industrial category.
- The flow or loading of BOD_5 or TSS introduced by the industrial category exceeds 10 percent of the design flow or loading to the POTW.

When making this adjustment, the Part 133 values for BOD_5 and TSS should be adjusted proportionately. Accordingly, a permit writer should make the adjustment using a flow-weighted or loading-weighted average of the two concentration limitations (i.e., the limitations developed from effluent guidelines for the industrial facility and the secondary or equivalent to secondary limitations).

Adjustments to Percent Removal Requirements

The 85 percent removal requirement (for a 30-day average) in secondary treatment standards was originally established to achieve two basic objectives:

- To encourage municipalities to remove high quantities of infiltration and inflow (I/I) from their sanitary sewer systems.
- To prevent intentional dilution of influent wastewater.

In facilities with dilute influent that is not attributable to high quantities of I/I or intentional dilution, the percent removal requirement could result in forcing *advanced treatment* rather than the intended secondary treatment. Advanced treatment generally refers to treatment processes following secondary treatment (e.g., filtration, chemical addition, or two-stage biological treatment). Advanced treatment can achieve significantly greater pollutant removals than secondary treatment processes but at a higher cost.

The regulations at §§ 133.103(a), (d) and (e) provide that, under certain circumstances, permit writers may set less stringent limitations for BOD_5 and TSS percent removal. The specific circumstances and the potential adjustments to the percent removal requirement are as follows:

- **Treatment works that receive less concentrated wastes from combined sewer systems** are eligible to have less stringent monthly percent removal limitations during wet-weather events [§ 133.103 (a)] and, under certain conditions, less stringent percent removal requirements or a mass loading limitation instead of a percent removal requirement during dry weather [§ 133.103 (e)]. The permit writer must determine on a case-by-case basis whether any attainable percentage removal level can be defined during wet weather and, if so, what the level should be. To qualify for a less stringent percent removal requirement or substitution of a mass limitation during dry weather, the discharger must satisfactorily demonstrate the following:

  1. The facility is consistently meeting, or will consistently meet, its permit effluent concentration limitations, but cannot meet its percent removal limitations because of less concentrated influent. A permitting authority should consider establishing criteria for

documenting what constitutes consistently meeting concentration limitations and what constitutes being unable to meet percent removal limitations because of less concentrated influent.

2. To meet the percent removal requirements, the facility would have to achieve significantly more stringent effluent concentrations than would otherwise be required by the concentration-based standards. Each permitting authority also should consider establishing criteria for demonstrating that this condition is met (e.g., because of dilute influent, X percent of the time a discharger would be forced to meet concentration requirements that are X percent more stringent than the concentration limitations otherwise applicable to satisfy the percent removal requirements).

3. The less concentrated influent wastewater does not result from either excessive infiltration or clear water industrial discharges during dry weather periods. The determination of whether the less concentrated wastewater results from excessive infiltration is discussed in regulations at § 35.2005(b)(28). This regulation defines nonexcessive infiltration as the quantity of flow that is less than 120 gallons per capita per day (domestic base flow and infiltration) or the quantity of infiltration that cannot be economically and effectively eliminated from a sewer system as determined in a cost-effectiveness analysis. The regulations at § 133.103(e) include the additional criterion that either 40 gallons per capita per day or 1,500 gallons per inch diameter per mile of sewer may be used as the threshold value for that portion of dry-weather base flow attributed to infiltration. If the less concentrated influent wastewater is the result of clear water industrial discharges, then the treatment works must control such discharges pursuant to Part 403.

- **Treatment works that receive less concentrated wastes from separate sewer systems** can qualify to have less stringent percent removal requirement or receive a mass loading limitation instead of the percent removal requirement provided the treatment plant demonstrates all of the following [§ 133.103(d)]:

  1. The facility is consistently meeting or will consistently meet its permit effluent concentration limitations but cannot meet its percent removal limitations because of less concentrated influent wastewater. For additional detail on this criterion, see discussion above for combined sewers during dry weather.

  2. To meet the percent removal requirements, the facility would have to achieve significantly more stringent limitations than would otherwise be required by the concentration-based standards. For additional detail on this criterion, see the discussion above for combined sewers during dry weather.

  3. The less concentrated influent wastewater does not result from excessive infiltration and inflow (I/I). The regulation indicates that the determination of whether the less concentrated wastewater is the result of excessive I/I will use the definition of excessive I/I at § 35.2005(b)(16), plus the additional criterion that flow is nonexcessive if the total flow to the POTW (i.e., wastewater plus inflow plus infiltration) is less than 275 gallons per capita per day. The regulation at § 35.2005(b)(16) defines excessive I/I as the quantities of I/I that can be economically eliminated from a sewer system as determined in a cost-effectiveness analysis that compares the costs for correcting the I/I conditions to the total costs for

transportation and treatment of the I/I. This regulation also refers to definitions of nonexcessive I/I in §§ 35.2005(b)(28) and 35.2005(b)(29).

Secondary Treatment Variance for Ocean Discharge—CWA Section 301(h) Variance

CWA section 301(h) provides for variances from secondary treatment standards for POTWs that discharge into ocean waters if the modified requirements do not interfere with attainment or maintenance of water quality. Permit writers should note that the deadline to apply for a CWA section 301(h) variance (December 29, 1982) has passed, thus no new facilities may apply for this variance.

Eligible POTW applicants meeting the set of environmentally stringent criteria in CWA section 301(h) receive a modified NPDES permit waiving the secondary treatment requirements for the conventional pollutants of BOD_5, TSS, and pH. EPA issued regulations, developed the *Amended Section 301(h) Technical Support Document*[2], and prepared a website titled Amendments to Regulations Issued, the Clean Water Act Section 301 (h) Program <www.epa.gov/owow/oceans/discharges/301h.html>. EPA has promulgated specific regulations pertaining to CWA section 301(h) that are provided in Part 125, Subpart G.

All CWA section 301(h) variance modified permits must contain the following specific permit conditions:

- Effluent limitations and mass loadings that will assure compliance with Part 125, Subpart G.
- Requirements for pretreatment program development, a nonindustrial toxics control program, and control of combined sewer overflows.
- Monitoring program requirements that include biomonitoring, water quality, and effluent monitoring.
- Reporting requirements that include the results of the monitoring programs.

No new or substantially increased discharges from the point source of the affected pollutant can be released above that volume of discharge specified in the permit.

5.1.3.6 Step 6: Document the Application of Secondary or Equivalent to Secondary Treatment Standards and all Adjustments and Considerations in the Fact Sheet

Permit writers need to document their application of secondary or equivalent to secondary treatment standards in the NPDES permit fact sheet for municipal facilities. The permit writer should clearly identify the data and information used to determine whether secondary treatment standards or equivalent to secondary treatment standards or adjusted standards apply and how that information was used to derive effluent limitations for the permit. The permit writer should also note all adjustments and special considerations in the fact sheet. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the NPDES permit properly incorporates secondary treatment standards.

5.2 Technology-Based Effluent Limitations for Industrial (Non-POTW) Dischargers

EPA is required to promulgate technology-based limitations and standards that reflect pollutant reductions that can be achieved by categories, or subcategories, of industrial point sources using specific

technologies (including process changes) that EPA identifies as meeting the statutorily prescribed level of control under the authority of CWA sections 301, 304, 306, 307, 308, 402, and 501 (33 *United States Code* [U.S.C.] 1311, 1314, 1316, 1318, 1342, and 1361). Those national industrial wastewater controls are called effluent limitations guidelines and standards (effluent guidelines). Unlike other CWA tools, such as water quality standards, effluent guidelines are national in scope and establish performance standards for all facilities within an industrial category or subcategory.

For point sources that introduce pollutants directly into the waters of the United States (direct dischargers), the effluent guidelines promulgated by EPA are implemented through NPDES permits as authorized in CWA sections 301(a), 301(b), and 402. For sources that discharge to POTWs (indirect dischargers), EPA promulgates pretreatment standards that apply directly to those sources and are enforced by POTWs and state and federal authorities as authorized in CWA sections 307(b) and (c).

When developing TBELs for industrial (non-POTW) facilities, the permit writer must consider all applicable technology standards and requirements for all pollutants discharged. Without applicable effluent guidelines for the discharge or pollutant, permit writers must identify any needed TBELs on a case-by-case basis, in accordance with the statutory factors specified in CWA sections 301(b)(2) and 304(b). The site-specific TBELs reflect the BPJ of the permit writer, taking into account the same statutory factors EPA would use in promulgating a national effluent guideline regulation, but they are applied to the circumstances relating to the applicant. The permit writer also should identify whether state laws or regulations govern TBELs and might require more stringent performance standards than those required by federal regulations. In some cases, a single permit could have TBELs based on effluent guidelines, BPJ, and state law, as well as WQBELs based on water quality standards.

Sections 5.2.1 and 5.2.2 below provide an overview of effluent guidelines and development of TBELs in NPDES permits using the effluent guidelines. Section 5.2.3 below discusses the development of TBELs in the absence of effluent guidelines (i.e., case-by-case limitations developed using BPJ).

5.2.1 Effluent Guidelines

Congress saw the creation of a single national pollution control requirement for each industrial category, based on the best technology the industry could afford, as a way to reduce the potential creation of *pollution havens* and to attain a high-level water quality in the nation's waters. Consequently, EPA's goal in establishing effluent guidelines is to ensure that industrial facilities with similar characteristics will meet similar effluent limitations representing the best pollution control technologies or pollution prevention practices regardless of their location or the nature of the receiving water into which the discharge is made. In establishing the effluent guidelines, EPA must consider the industry-wide economic achievability of implementing the technology and the incremental costs in relation to the pollutant-reduction benefits.

Effluent guidelines can include numeric and narrative limitations, including best management practices (BMPs), to control the discharge of pollutants from categories of point sources. The limitations are based on data characterizing the performance of technologies available and, in some cases, from modifying process equipment or the use of raw materials. Although the regulations do not require the use of any particular treatment technology, they do require facilities to achieve effluent limitations that reflect the proper operation of the *model* technologies selected as the basis for the effluent guidelines and from which the performance data were obtained to generate the limitations. Therefore, each facility has the

discretion to select any technology design and process changes necessary to meet the performance-based discharge limitations and standards specified by the effluent guidelines.

As of the date of this manual's publication, EPA has issued effluent guidelines for 56 industrial categories, which apply to between 35,000 and 45,000 facilities that discharge directly to waters of the United States and another 12,000 facilities that discharge into POTWs. The regulations prevent the discharge of more than 1.2 billion pounds of toxic (priority) and nonconventional pollutants each year. EPA's Effluent Guidelines Program Website <www.epa.gov/guide/> provides information on existing effluent guidelines, current effluent guidelines rulemaking, and the effluent guidelines planning process.

5.2.1.1 Statutory Foundation for Effluent Guidelines

The CWA directs EPA to promulgate effluent guidelines reflecting pollutant reductions that can be achieved by existing facilities in categories or subcategories of industrial point sources using specific control technologies. In addition, EPA is required to develop effluent guidelines for new sources. Those levels of control are summarized below and in Exhibit 5-8.

Exhibit 5-8 Summary of CWA technology levels of control

Type of sites regulated	BPT	BCT	BAT	NSPS	PSES	PSNS
Existing Direct Dischargers	X	X	X			
New Direct Dischargers				X		
Existing Indirect Dischargers					X	
New Indirect Dischargers						X
Pollutants regulated	**BPT**	**BCT**	**BAT**	**NSPS**	**PSES**	**PSNS**
Conventional Pollutants	X	X		X		
Nonconventional Pollutants	X		X	X	X	X
Toxic (Priority) Pollutants	X		X	X	X	X

Best Practicable Control Technology Currently Available (BPT)

BPT is the first level of technology-based effluent controls for direct dischargers and it applies to all types of pollutants (conventional, nonconventional, and toxic). The Federal Water Pollution Control Act (FWPCA) amendments of 1972 require that when EPA establishes BPT standards, it must consider the industry-wide cost of implementing the technology in relation to the pollutant-reduction benefits. EPA also must consider the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA section 304(b)(1)(B)]. Traditionally, EPA establishes BPT effluent limitations on the basis of the average of the best performance of well-operated facilities in each industrial category or subcategory. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied. See CWA sections 301(b)(1)(A) and 304(b)(1)(B).

Best Conventional Pollutant Control Technology (BCT)

The 1977 CWA requires EPA to identify effluent reduction levels for conventional pollutants associated with BCT for direct discharges from existing industrial point sources. As with BPT, when establishing BCT the Agency considers the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA section 304(b)(4)(B)]. In addition, EPA also considers a two-part *cost reasonableness* test, as required by CWA section 304(b)(4)(B), which includes (1) consideration of the reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived and (2) a comparison of the cost and level of reduction of such pollutants from the discharge from POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources. EPA explained its methodology for developing BCT limitations in detail in 51 FR 24974, July 9, 1986 <www.epa.gov/npdes/pubs/fr_bct_1986.pdf>. See CWA sections 301(b)(2)(E) and 304(b)(4).

Best Available Technology Economically Achievable (BAT)

For the direct discharge of toxic and non-conventional pollutants, EPA promulgates effluent guidelines based on BAT. The FWPCA amendments of 1972 require EPA to consider the cost of achieving effluent reductions when defining BAT; however, they do not specifically require EPA to balance the cost of implementation against the pollution reduction benefit. The technology selected for BAT must be economically achievable [CWA section 301(b)(2)(A)]. EPA generally defines BAT on the basis of the performance associated with the best control and treatment measures that facilities in an industrial category are capable of achieving. Like BPT and BCT, other factors EPA must consider in assessing BAT include the age of equipment and facilities involved, the process employed, process changes, non-water quality environmental impacts, including energy requirements, and other such factors as the EPA Administrator deems appropriate [CWA section 304(b)(2)(B)]. The Agency retains considerable discretion in assigning the weight accorded to these factors. BAT limitations may be based on effluent reductions attainable through changes in a facility's processes and operations. Where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved within a subcategory on the basis of technology transferred from a different subcategory or category. BAT may be based on process changes or internal controls, even when those technologies are not common industry practice. See CWA sections 301(b)(2)(A), (C), (D) and (F) and 304(b)(2).

New Source Performance Standards (NSPS)

NSPS reflect effluent reductions that are achievable by direct dischargers based on the best available demonstrated control technology. New sources have the opportunity to install the best and most efficient production processes and wastewater treatment technologies at the time of construction. As a result, NSPS should represent the most stringent controls attainable through the application of the best available demonstrated control technology for all pollutants (i.e., conventional, nonconventional, and toxic pollutants). In establishing NSPS, EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements. See CWA section 306.

Pretreatment Standards for Existing Sources (PSES)

PSES are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs, including incompatibility with the POTW's chosen biosolids (sewage sludge) disposal methods. The categorical pretreatment standards for existing indirect dischargers are technology-based and are analogous to BAT. The general pretreatment regulations, which set forth the framework for the implementation of national pretreatment standards, are at Part 403. See CWA section 307(b).

Pretreatment Standards for New Sources (PSNS)

Like PSES, PSNS are designed to prevent the discharges of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. PSNS are to be issued at the same time as NSPS. New indirect dischargers have the opportunity to incorporate into their facilities the best available demonstrated technologies at the time of construction. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS. See CWA section 307(c).

EPA typically does not establish pretreatment standards for conventional pollutants (e.g., BOD_5, TSS, oil and grease) because POTWs are designed to treat such pollutants, but EPA has exercised its authority to establish categorical pretreatment standards for conventional pollutants as surrogates for toxic or nonconventional pollutants or to prevent interference. For example, EPA established categorical pretreatment standards for new and existing sources with a one-day maximum concentration of 100 mg/L oil and grease in the Petroleum Refining Point Source Category in Part 419 based on "the necessity to minimize [the] possibility of slug loadings of oil and grease being discharged to POTWs."[3]

The final statutory deadline for meeting BPT requirements was July 1, 1977, and the final statutory deadline for meeting BCT and BAT requirements was March 31, 1989. When applying applicable effluent guidelines, permit writers should note that they do not have the authority to extend the statutory deadlines in an NPDES permit; thus, all applicable technology-based requirements (i.e., effluent guidelines and case-by-case limitations based on BPJ) must be applied in NPDES permits without the benefit of a compliance schedule. In addition, though NSPS do not have specific dates as compliance deadlines, they are effective on the date the new source begins discharging. The facility must demonstrate compliance with NSPS within 90 days of discharge [see § 122.29(d)]. For more information on determining whether a discharge is subject to NSPS, see Appendix D of this manual. For additional information on the statutory and regulatory history of the NPDES program, see section 1.2 of this manual.

5.2.1.2 EPA's Development of Effluent Guidelines

EPA establishes national effluent guidelines for a specific industrial sector by regulation after considering an in-depth engineering and economic analysis of the industrial sector. EPA's Industrial Regulations Website <www.epa.gov/guide/industry.html> provides development documents for some specific industry categories (e.g., Iron and Steel Manufacturing and Metal Products and Machinery). Those documents contain additional information on how EPA develops effluent guidelines.

For each industrial sector, EPA assesses the performance and availability of the best pollution control technologies and pollution prevention practices that are available for an industrial category or subcategory. The effluent guidelines are promulgated for various industrial categories in 40 CFR, Chapter I, Subchapter N - Effluent Guidelines and Standards - Parts 400-471 <www.epa.gov/lawsregs/search/40cfr.html>.

In promulgating effluent guidelines, EPA may divide an industrial point source category into groupings of subcategories to provide a method for addressing variations between products, raw materials, processes, and other factors that result in distinctly different characteristics. Regulation of an industrial category using subcategories allows each subcategory to have a uniform set of requirements that take into account technological achievability and economic impacts unique to that subcategory. Grouping similar facilities into subcategories increases the likelihood that the regulations are practicable and diminishes the need to address variations between facilities within a category through a variance process. For more on variances, see section 5.2.2.7 below. EPA considers a number of different subcategorization factors during an effluent guidelines rulemaking, including the following:

- Manufacturing products and processes.
- Raw materials.
- Wastewater characteristics.
- Facility size.
- Geographical location.
- Age of facility and equipment.
- Wastewater treatability.

For each possible treatment technology option for an industry, EPA conducts an analysis of industry-wide incremental compliance costs, pollutant loadings and removals, and related non-water quality effects. The Agency also performs an economic analysis to assess the financial impact on the industry of implementing each option. That entire process involves data collection, rigorous data review, engineering analysis, and public comment. EPA selects a technology to serve as the *model* technology for pollutant removal for each required level of control (i.e., BPT, BCT, BAT, NSPS, PSES, and PSNS). Limitations and other requirements in the effluent guidelines for each level of control are based on application of the model technology to the category or subcategory of facilities.

Effluent guidelines are not always established for every pollutant present in a point source discharge. In many instances, EPA promulgates effluent guidelines for an *indicator* pollutant. Industrial facilities that comply with the effluent guidelines for the indicator pollutant will also control other pollutants (e.g., pollutants with a similar chemical structure). For example, EPA may choose to regulate only one of several metals present in the effluent from an industrial category, and compliance with the effluent guidelines will ensure that similar metals present in the discharge are adequately controlled. Additionally, for each industry sector EPA typically considers whether a pollutant is present in the process wastewater at treatable concentrations and whether the model technology for effluent guidelines effectively treats the pollutant. For example, see Figure 6-1 Pollutant of Concern Methodology <www.epa.gov/guide/cwt/final/develop/ch6.pdf> on page 6-4 of the *Centralized Waste Treatment category Technical Development Document*.

The CWA requires EPA to annually review existing effluent guidelines for both direct and indirect dischargers. CWA section 304(m) also requires EPA to publish an effluent guidelines program plan every 2 years. As part of the development of the biennial plan, the public is provided an opportunity to comment on a *preliminary* plan before it is finalized. The preliminary plan is published in odd-numbered years, and the final plan is published in even-numbered years. EPA encourages permit writers to participate in the effluent guidelines planning process and comment on the preliminary effluent guidelines program plans presented on the Effluent Guidelines Biennial Plan Website <www.epa.gov/guide/304m/index.html>.

5.2.1.3 Types of Limitations in Effluent Guidelines

Although the requirements in effluent guidelines generally are numeric limitations on the mass or concentration of a pollutant that can be discharged directly into waters of the United States, CWA section 502(11) defines *effluent limitation* broadly. This section describes several types of possible expressions for the limitations found in effluent guidelines. The permit writer should note that the limitations in effluent guidelines might need to be translated into an appropriate form to be included as effluent limitations in an NPDES permit. That process is discussed further in section 5.2.2 below.

Mass- or Concentration-based Numeric Limitations

Limitations in effluent guidelines generally are expressed as numeric values, which are upper bounds of the amount of pollutant that may be discharged. For most pollutants, these limitations are mass-based or concentration-based values. They are, in effect, measures of how well the production, wastewater treatment, and pollution prevention processes must be operated. In the course of developing effluent guidelines regulations, EPA uses data on a number of different pollutants from facilities with the selected model technologies to determine the appropriate numeric limitations. The limitations generally consist of upper bounds (maximum values) established for both the daily discharge and for the average monthly discharge.

In developing numeric limitations in effluent guidelines, EPA first determines an average performance level (the *long-term average*) that a facility with well-designed and operated model technologies reflecting the appropriate level of control is capable of achieving. That long-term average is calculated from data taken from facilities using the model technologies that were selected as a basis for the limitations. EPA expects that all facilities subject to the limitations will design and operate their treatment systems to achieve the long-term average performance level consistently because facilities with well-designed and operated model technologies have demonstrated that it can be done. The technical development document for the effluent guidelines usually identifies the long-term average for the model technologies; however, they generally are not part of the limitations in the effluent guidelines or TBELs in the permit. The limitations generally are expressed as *maximum daily* and *average monthly limitations* (see definitions in Exhibit A-2 in Appendix A of this document) that include an allowance for variability around the long-term average.

EPA acknowledges that process and treatment systems have inherent variability and, therefore, incorporates an allowance for this variation into the limitations specified in the effluent guidelines. That allowance is based on statistical analysis of the data from facilities using the model technologies. The limitations included in effluent guidelines incorporate all components of variability including shipping, sampling, storage, and analytical variability. By accounting for those reasonable excursions above the long-term average, the limitations in effluent guidelines generally are well above the actual long-term averages. If a facility operates its treatment system to meet the long-term average, EPA expects the facility will be able to meet the limitations specified in the effluent guidelines based on that long-term average.

EPA has different objectives in establishing maximum daily and average monthly limitations in effluent guidelines. In establishing maximum daily limitations, EPA's objective is to restrict the discharges on a daily basis at a level that is achievable for a facility that targets its treatment at the long-term average. In establishing average monthly limitations, EPA's objective is to provide an additional restriction to help

ensure that facilities target their average discharges in a manner that will achieve the long-term average. The average monthly limitation requires continuous dischargers to provide ongoing control on a monthly basis that complements controls imposed by the maximum daily limitation. To meet the average monthly limitation, a facility must counterbalance a value near the maximum daily limitation with one or more values well below the maximum daily limitation. To achieve compliance, the values must result in an average monthly value at or below the average monthly limitation. As explained below, EPA uses a smaller percentile basis for the average monthly limitation than the maximum daily limitation to encourage facilities to target their systems to a value closer to the long-term average.

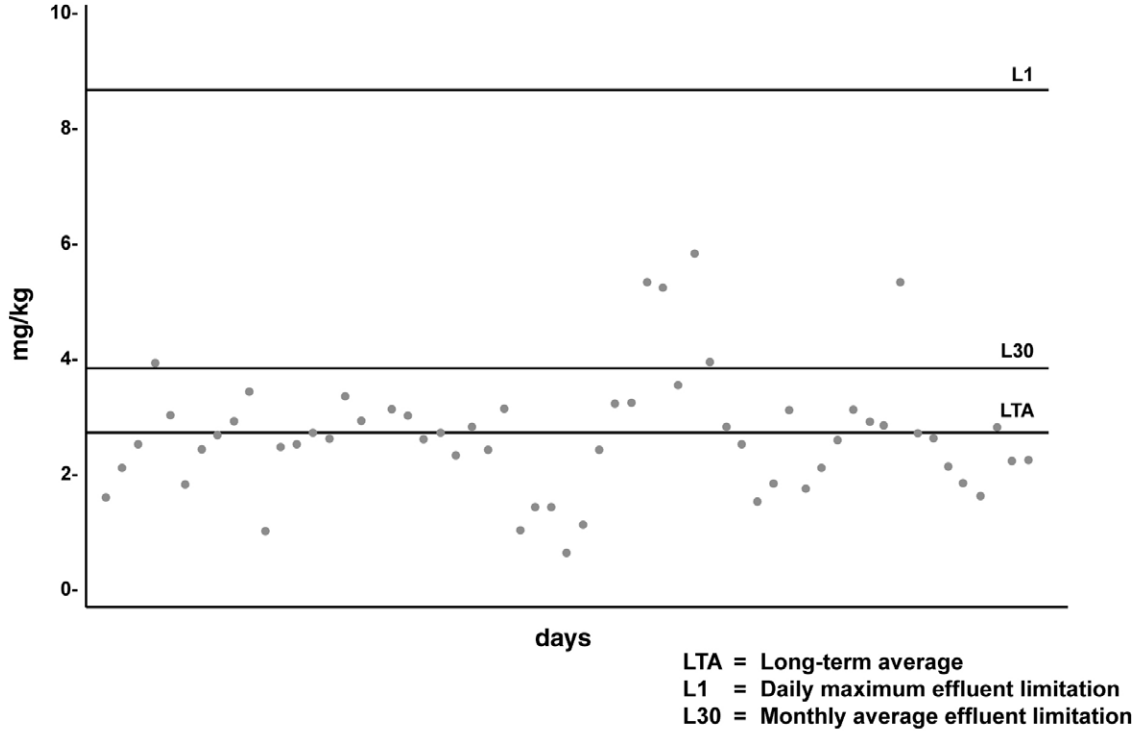
EPA generally uses statistical procedures to determine the values of the limitations specified in the effluent guidelines. Those procedures involve fitting effluent data to distributions and using estimated upper percentiles of the distributions. EPA defines the maximum daily limitation as an estimate of the 99th percentile of the distribution of the daily measurements. The average monthly limitation is an estimate of the 95th percentile of the distribution of the monthly averages of the daily measurements. EPA bases its limitations on percentiles chosen with the intention that they be high enough above the long-term average to accommodate reasonably anticipated variability within control of the facility. In conjunction with the statistical methods, EPA performs an engineering review to verify that the limitations are reasonable on the basis of the design and expected operation of the control technologies and the facility process conditions. Such limitations are translated into effluent limitations in a facility's NPDES permit. Facilities must comply with the effluent limitations in their permits at all times. EPA has prevailed in several judicial challenges to its selection of percentiles and on other issues related to limitations specified in effluent guidelines. [See, for example, *Chemical Manufacturers Association v. U.S. Environmental Protection Agency*, 870 F.2d 177, 230 (5th Cir. 1989) and *National Wildlife Federation, et al v. Environmental Protection Agency*, 286 F.3d 554 (D.C. Cir. 2002)]

Exhibit 5-9 depicts an example of TSS data for a facility that is operating around a required long-term average level for TSS. The dots represent daily measurements, and the reference lines show the values for the long-term average (LTA), the maximum daily limitation (L1), and the average monthly limitation (L30). The facility has demonstrated compliance with both the maximum daily and average monthly limitations. Daily measurements include values both above and below the long-term average; however, all the data values are below the maximum daily limitation. Some individual daily values exceed the average monthly limitation; however, within each month, the average of the daily values is less than the average monthly limitation.

EPA generally exercises four basic alternatives in setting mass- or concentration-based numeric limitations specified in effluent guidelines:

- Mass-based, production-normalized limitations (e.g., the pollutant discharge is not to exceed 1 pound per 1,000 pounds of production).
- Mass-based, flow-normalized limitations (e.g., the pollutant discharge is not to exceed the mass determined by multiplying the process wastewater flow subject to the effluent guideline by the concentration requirement in the guideline).
- Concentration-based limitations (e.g., the pollutant discharge is not to exceed 1 mg of pollutant per liter of wastewater).
- Limitations requiring *zero discharge* of specific pollutants or all pollutants.

Exhibit 5-9 Visual example of TSS LTA, maximum daily limitation and average monthly limitation



Except where a limitation requiring *zero discharge* of pollutants is applicable, EPA generally prefers setting production-normalized, mass-based limitations specified in effluent guidelines, where feasible, because production normalized limitations can reflect some expectation that the facility will conserve water and can reduce any potential for substituting dilution for treatment. EPA generally establishes concentration-based effluent guidelines when production and achievable wastewater flow cannot be correlated nationally. For example, in the Metal Finishing point source Category (Part 433), the Agency considered but decided against expressing the effluent guidelines as production-normalized mass-based effluent guidelines, "With the wide range of operations, product quality requirements, existing process configurations, and difficulties in measuring production, no consistent production normalizing relationship could be found. Concentration-based limits, however, can be consistently attained throughout the industry." [See 47 FR 38465, 31 August 1982.]

Numeric Limitations Established at Minimum Levels

Using percentile estimates to set limitations in effluent guidelines is not a requirement under the CWA. In some cases, the model technology for treating a pollutant might be capable of removing that pollutant to levels that cannot be reliably measured with existing analytical methods. EPA sometimes sets a requirement in the effluent guidelines that the concentration of a pollutant in the discharge must be below a *minimum level* or ML. The ML is the lowest level at which the entire analytical system must give a recognizable signal and an acceptable calibration point for the pollutant being analyzed. Where a limitation in the effluent guidelines is set at *less than the ML*, the value of the ML is specified in the effluent guidelines regulation on the basis of the analytical methods that EPA used to chemically analyze wastewaters in developing the regulation. For example, in the Pulp, Paper, and Paperboard point source

category (Part 430) the Daily Maximum BAT effluent guideline for the Tetrachlorodibenzofuran (TCDF) congener of dioxin is expressed as <*ML* for papergrade sulfite (Subpart E) mills, which means "less than the minimum level specified in part 430.01(i)" (i.e., 10 picograms/liter for TCDF). If, in the future, analytical methods become more sensitive with lower MLs, EPA would determine whether the technologies for reducing the amount of the pollutant in the discharge are capable of achieving more stringent limitations and, thus, whether it would be appropriate to modify the requirements of the effluent guideline.

EPA has not established average monthly limitations in effluent guidelines when the maximum daily limitation is an ML limitation. The purpose of an average monthly limitation is to require continuous dischargers to provide better control, on a monthly basis, than required by the maximum daily limitation. However, for these pollutants, the data were determined by analytical methods that could not measure below the ML specified in the regulations. Thus, even if a permitting authority requires monitoring for the pollutants more frequently than once a month, average monthly limitations would still be expressed as *less than the ML* or < *ML*.

Other Expressions for Numeric Limitations

EPA also promulgates effluent guidelines for pollutants that cannot be expressed in terms of mass or concentration (e.g., pH, temperature, radiation) or are better expressed through other means (e.g., unitless ratios). For example, pH is generally expressed as an acceptable range (e.g., 6.0–9.0 standard pH units).

Nonnumeric Effluent Limitations

In some cases, EPA includes nonnumeric or narrative effluent limitations rather than, or in addition to, numeric limitations in effluent guidelines. Nonnumeric effluent limitations might include specific BMPs or requirements to minimize or eliminate discharges. CWA sections 304(e), 308(a), 402(a), and 501(a) authorize the Administrator to prescribe BMPs as part of effluent guidelines and as part of an NPDES permit. CWA section 304(e) authorizes EPA to include supplemental BMPs in effluent guidelines for toxic or hazardous pollutants for the purpose of controlling "plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage." Several effluent guidelines include BMPs as requirements. Some effluent guidelines, such as the Concentrated Aquatic Animal Production point source category (Part 451), include the BMPs requirement exclusively. Section 9.1.2 of this manual further discusses BMPs.

CWA section 402(a)(1) and (2) and the NPDES regulations at § 122.44(k) also authorize BMPs in NPDES permits to control or abate the discharge of pollutants when numeric effluent limitations are infeasible, or when the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

Once EPA establishes effluent guidelines, the permit writer is responsible for translating the limitations and other requirements of the effluent guidelines into TBELs and other conditions appropriate for inclusion in an NPDES permit. Section 5.2.2 below discusses a step-by-step approach for applying effluent guidelines through NPDES permits.

5.2.2 Applying Effluent Guidelines through NPDES Permits

Permit writers need to have a detailed knowledge of the industrial facility applying for a new or reissued NPDES permit to identify applicable effluent guidelines and know how to use them to derive TBELs. This section provides a step-by-step procedure for applying effluent guidelines to direct discharges through NPDES permits as shown in Exhibit 5-10.

Exhibit 5-10 Steps for applying effluent guidelines to direct discharges

Step 1.	Learn about the industrial discharger
Step 2.	Identify the applicable effluent guidelines category(ies)
Step 3.	Identify the applicable effluent guidelines subcategory(ies)
Step 4.	Determine whether existing or new source standards apply
Step 5.	Calculate TBELs from the effluent guidelines
Step 6.	Account for overlapping or multiple effluent guidelines requirements
Step 7.	Apply additional regulatory considerations in calculating TBELs
Step 8.	Apply additional effluent guidelines requirements
Step 9.	Document the application of effluent guidelines in the fact sheet

5.2.2.1 Step 1: Learn About the Industrial Discharger

To write a defensible permit, the permit writer should have a solid understanding of the facility's operations. The permit writer should gather sufficient information to identify applicable effluent guidelines and derive TBELs. Facility-specific information the permit writer is likely to need includes the following:

- Industrial processes and raw materials.
- Products and services.
- Amount of manufacturing production or servicing.
- Number of production and non-production days.
- Current pollution prevention practices and wastewater treatment technology(ies).
- Discharge location of the wastewater pollutants and potential compliance sampling points.
- The source and characteristics of the wastewaters (including flow) and pollutants that are being discharged or have the potential to be discharged from the facility.

Sources of information include the facility's permit application, the current permit and fact sheet (if the facility is permitted), discharge monitoring reports, site visits, site inspections (such as compliance evaluation inspections for an existing permit), and other information submitted by the facility. The permit writer also should identify any information that would assist in determining whether the facility or part of the facility is considered a new source (e.g., age of facility and equipment).

5.2.2.2 Step 2: Identify the Applicable Effluent Guidelines Category(ies)

As noted above, EPA's effluent guidelines are at 40 CFR, Chapter I, Subchapter N - Effluent Guidelines and Standards, Parts 400–471 <www.epa.gov/lawsregs/search/40cfr.html>. A summary of promulgated effluent guidelines is presented on EPA's Industrial Regulations Website <www.epa.gov/guide/industry.html> and in Exhibit 5-11 below.

Exhibit 5-11 Table of existing point source categories (June 2010)

Industry category (listed alphabetically)	40 CFR Part	Industry category (listed alphabetically)	40 CFR Part
Aluminum Forming	467	Meat and Poultry Products	432
Asbestos Manufacturing	427	Metal Finishing	433
Battery Manufacturing	461	Metal Molding and Casting	464
Canned and Preserved Fruits and Vegetable Processing	407	Metal Products and Machinery	438
Canned and Preserved Seafood Processing	408	Mineral Mining and Processing	436
Carbon Black Manufacturing	458	Nonferrous Metals Forming and Metal Powders	471
Cement Manufacturing	411	Nonferrous Metals Manufacturing	421
Centralized Waste Treatment	437	Oil and Gas Extraction	435
Coal Mining	434	Ore Mining and Dressing	440
Coil Coating	465	Organic Chemicals, Plastics, and Synthetic Fibers	414
Concentrated Animal Feeding Operations (CAFOs)	412	Paint Formulating	446
Concentrated Aquatic Animal Production	451	Paving and Roofing Materials (Tars and Asphalt)	443
Copper Forming	468	Pesticide Chemicals	455
Dairy Products Processing	405	Petroleum Refining	419
Electrical and Electronic Components	469	Pharmaceutical Manufacturing	439
Electroplating*	413	Phosphate Manufacturing	422
Explosives Manufacturing	457	Photographic	459
Ferroalloy Manufacturing	424	Plastic Molding and Forming	463
Fertilizer Manufacturing	418	Porcelain Enameling	466
Glass Manufacturing	426	Pulp, Paper, and Paperboard	430
Grain Mills	406	Rubber Manufacturing	428
Gum and Wood Chemicals	454	Soaps and Detergents Manufacturing	417
Hospitals	460	Steam Electric Power Generating	423
Ink Formulating	447	Sugar Processing	409
Inorganic Chemicals	415	Textile Mills	410
Iron and Steel Manufacturing	420	Timber Products Processing	429
Landfills	445	Transportation Equipment Cleaning	442
Leather Tanning and Finishing	425	Waste Combustors	444

* This category contains only categorical pretreatment standards (no effluent guidelines for direct dischargers).

The following sources of information might be helpful in identifying applicable effluent guidelines for a facility:

- **CFR titles and applicability section of the effluent guidelines**. This is first place to look for information for identifying applicable effluent guidelines. Each effluent guidelines regulation includes an applicability section for the category or each subcategory of the industry. The applicability section gives a general description of the types of facilities regulated by the effluent guidelines. The applicability sections often define certain industrial operations or other criteria (e.g., production or process wastewater flow thresholds) that identify whether a facility is regulated by the effluent guidelines.

- **North American Industry Classification System (NAICS) and Standard Industrial Classification (SIC)**. The current NAICS <www.census.gov/epcd/www/naics.html> and former SIC codes <www.census.gov/epcd/www/naicstab.htm> could be helpful to determine the appropriate industrial category(ies) for a facility. NAICS and SIC codes were developed and are maintained by the federal government as a way to classify establishments by type of activity for comparing economic and other types of facility-specific data. Although SIC codes provide a helpful starting point for categorizing a facility, permit writers should be cautious of relying exclusively on SIC codes for determining the appropriate industrial category. SIC codes were not developed using EPA's industrial classification scheme, or vice versa, and, therefore, the codes might not always correspond exactly with the categorization process. In addition, more than one SIC code might apply to a single facility. Item V-II of NPDES Application Form l requires that the applicant provide the SIC code for the activity covered by the permit application. In some instances, the SIC code will identify both the industrial category and the subcategory of a facility. Sometimes the SIC code might identify the appropriate industrial category but not the subcategory. Exhibit 5-12 presents two examples of how a permit writer might identify the applicable effluent guidelines using the facilities SIC codes.

Exhibit 5-12 Examples of identifying applicable effluent guidelines using SIC codes

Example 1

A facility that performs the primary smelting and refining of copper reports SIC code 3331 in its NPDES permit application. By scanning the list of industrial point source categories, the permit writer can determine that the facility is regulated by effluent guidelines in the Nonferrous Metals Manufacturing point source category (Part 421). In this case, the SIC code also indicates that the facility is likely regulated by effluent guidelines in the Primary Copper Smelting Subcategory.

Example 2

A facility that manufactures ethyl acrylate and 2-ethylhexyl acrylate (acrylic acid esters) reports the SIC code 2869 (Industrial Organic Chemicals, Not Elsewhere Classified) in its NPDES permit application. By scanning the list of industrial point source categories, the permit writer can determine that facility is likely regulated by effluent guidelines in the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) category (Part 414).

- **EPA's Development Documents and Compliance Guides**. EPA produces a number of documents that will aid permit writers in identifying applicable effluent guidelines and incorporating them into NPDES permits. In particular, development documents summarize the data and information EPA used to develop the effluent guidelines. Such documents are extremely useful in identifying the applicability of the effluent guidelines and how to incorporate the effluent guidelines into NPDES permits. EPA may also publish a compliance guide for permit writers and industry. EPA's Effluent Guidelines Website <www.epa.gov/guide/> provides available documents for specific industrial categories.

- **FR Notices**. The preamble text to the FR notices containing the proposed and final effluent guidelines rulemakings also provide additional insight into applicability of the effluent guidelines. EPA's Effluent Guidelines Website <www.epa.gov/guide/> provides FR notices for specific industrial categories. For example, the preambles to recently promulgated effluent guidelines typically list the SIC and NAICS codes for the potentially regulated facilities. Each Part in the CFR identifies the relevant FR notices. For example, § 419.11 (i.e., specialized definitions for

Subpart [subcategory] A for the Petroleum Refining point source category) identifies 47 FR 46446, October 18, 1982, as amended at 50 FR 28522, July 12, 1985, as its source.

- **EPA Industry Experts**. EPA has a number of subject matter experts <www.epa.gov/guide/contacts.html> at its headquarters office in Washington, D.C. that are available to answer questions on specific effluent guidelines. EPA's NPDES Contacts in Regional Offices <www.epa.gov/npdes/regionalcontacts> also offer assistance in sorting through the different effluent guidelines and NPDES regulations.

- **EPA's Effluent Guidelines Planning Support Documents.** EPA's Effluent Guidelines Biennial Plan Website <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> provides technical support documents and other information supporting EPA's biennial effluent guidelines program plans.

- **EPA's Sector Notebooks.** EPA's Sector Notebooks <www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/index.html> describe specific U.S. industries and governments and provide a holistic approach by integrating processes, applicable regulations, and other relevant environment information.

- **Other Sources**. Other sources of information include resources identified below in Exhibit 5-23, BPJ Permitting Tools. Permit and fact sheet and information from similar facilities might aid in identifying applicable effluent guidelines. However, the permit writer should not assume that a similar facility was correctly categorized in its permit and should examine the rationale for how the other permit writer identified any applicable effluent guidelines before relying on another permit to identify the applicable category.

Permit writers should be aware that effluent guidelines from two or more industrial point source categories might apply to a single facility. Step 6 below, provides additional information on overlapping or multiple effluent guidelines requirements.

5.2.2.3 Step 3: Identify the Applicable Effluent Guidelines Subcategory(ies)

In promulgating effluent guidelines, EPA may divide an industrial point source category into groupings called *subcategories* to provide a method for addressing variations between products, raw materials, processes, and other factors that result in distinctly different effluent characteristics or treatment options. Some effluent guidelines categories cover a variety of industrial sectors (e.g., the Nonferrous Metals Manufacturing point source category has 31 subcategories). It is important for the permit writer to correctly identify the applicable subcategory to derive TBELs.

The process of identifying the applicable effluent guidelines requires close review and comparison of information obtained from Step 1 and Step 2 above. Just as effluent guidelines from two or more industrial categories can apply to a single facility, it also is true that requirements from two or more subcategories could apply to a single facility.

Exhibit 5-13 presents two examples of how a permit writer can identify the subcategory containing the applicable effluent guidelines using information from the NPDES permit application.

Exhibit 5-13 Examples of identifying the subcategory with the applicable effluent guidelines

Example 1

A permit writer has identified the facility from Example 2 in Exhibit 5-12 above as potentially regulated by the effluent guidelines in the OCPSF point source category (Part 414) <www.epa.gov/guide/ocpsf/>. The permit writer can determine from a further review of the industrial categorization discussion in the *OCPSF Development Document* and the guidance document that the facility is likely subject to effluent guidelines in Subpart G (Bulk Organic Chemicals). Specifically, the applicability criteria section in Subpart G (§ 414.70) states, "The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the following: SIC 2865 and 2869 bulk organic chemicals and bulk organic chemical groups." Further, acrylic acid esters are listed in § 414.70 as an OCPSF product group.

Example 2

A large poultry slaughterhouse annually produces 200 million pounds of whole, halved, quarter or smaller meat cuts and reports SIC Code 2015 in its NPDES permit application. The permit writer reviewed the list of effluent guidelines and identified that the facility is likely regulated by effluent guidelines in the Meat and Poultry Products point source category (Part 432) <www.epa.gov/guide/mpp/>. The permit writer reviewed the preamble to the final effluent guidelines rule and the rule's development document. In that effluent guidelines regulation, EPA used NAICS codes to assist in applicability decisions. See 69 FR 54475, September 8, 2004. The permit writer used the U.S. Census Bureau's SIC to NAICS crosswalk website <www.census.gov/epcd/www/naicstab.htm> to identify the NAICS code (311615). Using the NAICS code, the permit writer can narrow the list of potentially applicable subcategories to the Poultry First Processing (Subpart K) or the Poultry Further Processing (Subpart L) subcategories. After reviewing the applicability criteria of both subcategories, the permit writer determined that only the effluent guidelines in Subpart K are likely applicable because the facility performs slaughtering operations, which are not regulated by Subpart L. Finally, the permit writer also needed to compare the average annual production of the facility (200 million pounds) with the production threshold in the effluent guidelines (100 million pounds per year). Because the facility produces more than the production threshold, the effluent guidelines in Subpart K are applicable to this facility. See §§ 432.112 and 432.113. In this example the permit writer would use the effluent guidelines for ammonia (as N), BOD_5, fecal coliform, oil and grease (as HEM), TSS, and total nitrogen to derive effluent limitations as detailed in section 5.2.2.5 below.

5.2.2.4 Step 4: Determine whether Existing or New Source Standards Apply

Section 5.2.1.1 above defines the different control technologies that apply to direct dischargers: BPT, BCT, BAT, and NSPS. The first three apply to existing direct dischargers, and the fourth to new sources. To determine whether existing source standards (i.e., BPT, BCT, and BAT) or NSPS apply to the facility, the permit writer must determine whether the facility or any part of the facility is a new source. A new source is defined in § 122.2 as a building, structure, facility, or installation that discharges pollutants or could discharge pollutants and for which construction began after promulgation of the applicable effluent guidelines or after proposal of the applicable effluent guidelines, but only if the effluent guidelines are promulgated within 120 days. Thus, the discharger's entire facility could be subject to new source standards (e.g., a brand new facility). Permit writers should note that the new source date for indirect dischargers is the date on which the pretreatment standard for new sources is proposed. See §403.3(m)(1).

Additional criteria for determining whether a discharge is a new source are defined in § 122.29(b) to cover situations where a facility is adding a new building or process line that results in a discharge to the waters of the United States. Such an addition would result in a new source if any of the following is true for the source:

- Is constructed at a site at which no other source is located.
- Totally replaces the process causing the discharge from an existing source.
- Has processes that are substantially independent of an existing source at the same site.

Furthermore, some effluent guidelines, such as the effluent guidelines for the Pulp, Paper, and Paperboard Point Source Category in Part 430, include additional criteria for making new source determinations. See § 430.01(j).

Appendix D of this manual provides the applicable new source dates used in making new source determinations by effluent guideline category as provided in Appendix B of the EPA memorandum *New Source Dates for Direct and Indirect Dischargers*[4] <www.epa.gov/npdes/pubs/newsource_dates.pdf> sent by the directors of the Water Permits Division and the Engineering and Analysis Division to the Regional Water Division Directors. Permit writers can use Appendix D of this manual to find the date for determining whether a facility or part of a facility is subject to NSPS.

Where a new source is the result of a new installation of process equipment at an existing facility, part of the facility might be subject to existing source standards and other parts of the facility subject to new source standards. Permit writers should identify whether the facility has installed any process equipment after the last issuance of the NPDES permit and apply the criteria from § 122.29(b) on a case-by-case basis to new construction or new processes, while applying existing source requirements to the existing portions of the facility. Sometimes it can be difficult to distinguish between a new source and a modification or alteration of an existing source, especially when modifications have occurred slowly over time. The permit writer should consult the effluent guidelines regulation to determine if it defines more specifically what constitutes a new source.

It is important to remember that after the effective date of a new source standard, the CWA stipulates that it is unlawful for any owner or operator to operate such a source in violation of those standards. See 33 U.S.C. 1316(e) and 1317(d). EPA's regulations specify that a new source "[must] install and have in operating condition, and [must] *start up* all pollution control equipment" required to meet applicable standards before beginning to discharge. The regulations also indicate that the owner or operator of a new source must meet all applicable standards within "the shortest feasible time (not to exceed 90 days)." See § 122.29(d)(4).

In addition to the requirement to meet NSPS upon beginning to discharge, an EPA-issued NPDES permit for a new source is a federal action subject to the requirements of the National Environmental Policy Act (NEPA), 33 U.S.C. 1371(c)(1). For more information on NEPA and the NPDES program, see section 11.1.2 of this manual.

For existing facilities and existing sources (where NSPS do not apply), existing source standards (i.e., BPT, BCT, BAT) apply. The permit writer would use the more stringent technology level of control for each pollutant. For example, the BPT level of control in the Veneer Subcategory of the Timber Products Processing category (Part 429, Subpart B) allows a discharge of process wastewater and identifies effluent guidelines for BOD_5 and pH, while the BAT level of control bans the direct discharge of process wastewater. Consequently, the NPDES permit for a facility regulated by the Veneer Subcategory must use the more stringent BAT requirements and prohibit the direct discharge of process wastewater. The effluent guidelines for the Renderers subcategory of the Meat and Poultry Products point source category (Subpart J, Part 432) provide another example. In those effluent guidelines, the BCT requirements for BOD_5, oil and grease, and TSS are more stringent than the corresponding BPT requirements. Accordingly, the permit writer would use the more stringent BCT requirements, rather than the BPT requirements, to derive numeric permit limitations for an existing renderer.

5.2.2.5 Step 5: Calculate TBELs from the Effluent Guidelines

Once a permit writer has identified the effluent guidelines that apply to a facility, he or she then uses those effluent guidelines to calculate applicable TBELs.

EPA's regulations at § 122.45(f)(1) stipulate that all pollutants limited in permits must have limitations, standards or prohibitions expressed in terms of mass except under any of the following conditions:

- For pH, temperature, radiation, or other pollutants that cannot appropriately be expressed by mass limitations.
- When applicable standards or limitations are expressed in terms of other units of measure.
- If in establishing technology-based permit limitations on a case-by-case basis, limitations based on mass are infeasible because the mass or pollutant cannot be related to a measure of production (e.g., discharges of TSS from certain mining operations). The permit conditions must ensure that dilution will not be used as a substitute for treatment.

Thus, the type of limitation (i.e., mass, concentration, or other units) calculated for a specific pollutant at a facility will depend on the type of pollutant and the way limitations are expressed in the applicable effluent guideline. Generally, effluent guidelines include both maximum daily and monthly average limitations for most pollutants. Though the effluent guidelines use different terms for monthly effluent limitations (e.g., monthly average, maximum for monthly average, average of daily values for 30 consecutive days), the requirements are expressed in NPDES permits as average monthly limitations as defined in § 122.2.

As stated in Steps 1 and 2 above, the permit writer would use many sources of information to calculate TBELs. From those sources, the permit writer should identify the source and characteristics of the wastewaters (including flow) and pollutants being discharged, or that have the potential to be discharged, and whether and how those pollutants are regulated by effluent guidelines. In particular, the permit writer should identify the following:

- The appropriate permit compliance point(s) (which might be specified in the effluent guidelines).
- Wastewaters subject to the applicable effluent guidelines and whether they are commingled with other wastewaters not regulated by effluent guidelines (e.g., sanitary wastewaters before the permit compliance point).
- Reasonable measure of the facility's actual long-term daily production and average number of production days per year regulated by effluent guidelines (necessary for derived effluent limitations from production-normalized effluent guidelines).
- Average daily facility flows at the compliance point(s) regulated by effluent guidelines.
- Average daily facility flows at the compliance point(s) not regulated by effluent guidelines.

That information is used in conjunction with the effluent guidelines for TBEL calculations as discussed below.

Calculating Mass-based TBELs from Production-Normalized Effluent Guidelines

Most effluent guidelines requirements are mass-based and expressed in terms of allowable pollutant discharge per unit of production or some other measure of production (i.e., production normalized). Permit writers incorporate such production-normalized effluent guidelines into NPDES permits as mass-based TBELs by using a reasonable measure of the permittee's actual long-term daily production. The objective in determining the production for a facility is to develop a single estimate of the long-term average daily production that can reasonably be expected to prevail during the next term of the permit (i.e., not the design production rate). Permit writers may establish such a production rate using the past 3 to 5 years of facility data. For example, the permit writer might wish to use the average daily production rate calculated using the highest annual production from the previous 3 to 5 years. Whatever value is selected, the permit writer should ensure that the production rate used in deriving mass-based effluent limitations is representative of the actual production likely to prevail during the next term of the permit.

The examples in Exhibit 5-14 illustrate the application of production-based effluent guidelines using the approach where annual production data are available. In Example 1 in Exhibit 5-14, the highest annual production rate during the past 5 years was used as the estimate of production. If historical trends, market forces, company plans to decrease production, or plant designs and capital expenditures for an increase in production indicated that a different level of production would prevail during the permit term, the permit writer could consider a different basis for estimating production or establish tiered discharge limitations, as discussed in section 5.2.2.7 below.

Calculating Mass-based TBELs from Flow-Normalized Effluent Guidelines

In some cases, permit writers are directed to calculate mass-based TBELs from flow-normalized effluent guidelines that are expressed as concentrations. For example, the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) effluent guidelines <www.epa.gov/waterscience/guide/ocpsf/> in Part 414 state that facilities "must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to [the effluent guideline] times the concentration listed in the [effluent guideline]…" The *Development Document for Effluent Limitations Guidelines and Standards for the Organic Chemicals, Plastics and Synthetic Fibers Point Source Category*[5] <www.epa.gov/waterscience/guide/ocpsf/#guidance> directs the permit writer to "use a reasonable estimate of process wastewater discharges and the concentration limitations [in the effluent guideline] to develop mass limitations for the NPDES permit." Thus, the process for calculating the TBELs is similar to the process used with production-normalized effluent guidelines, but rather than using a reasonable measure of the actual daily production, the permit writer would use a reasonable measure of the actual daily flow rate as the basis for calculating the TBELs.

As with estimating production to calculate TBELs, the objective in determining a flow estimate for a facility is to develop a single estimate of the actual daily flow rate (in terms of volume of process wastewater per day), which can reasonably be expected to prevail during the next term of the permit (i.e., not the design flow rate). Permit writers can establish that flow rate using the past 3 to 5 years of facility data in a manner similar to the method used to determine production. For example, the permit writer might wish to use the highest average daily flow rate from the average daily flows calculated for each of the past 3 to 5 years. The value selected should be representative of the actual flow likely to prevail during the next term of the permit.

Exhibit 5-14 Example of calculating mass-based effluent limitation from production-normalized effluent guidelines[6]

Example 1

Facility A has produced 331,000 tons, 301,500 tons, 321,500 tons, 330,000 tons, and 331,500 tons of product per year for the previous 5 years operating 255 days per year.

Question:
What would be a reasonable measure of production for permitting purposes?

Answer:
Using the highest year of production (331,500 tons per year) might be an appropriate and reasonable measure of production, if this figure is representative of the actual production expected to occur over the next term of the permit. Permit writers also should check to see if the maximum yearly value is within a certain percentage (e.g., 20 percent–see section 5.2.2.7 below) of the average value. In evaluating gross production figures, the number of production days should be considered. If the number of production days per year is not comparable, the permit writer would need to convert the numbers to production per day before comparing them. In this example, all the yearly production figures were based on 255 days per year of production, so they may be compared directly. The 331,500 tons per year figure is the maximum for the past 5 years, which is only 2.6 percent above the average annual production of 323,100 tons. Therefore, 331,500 tons is a reasonable measure of the annual production for the facility.

Example 2

For the same facility in Example 1 above with an annual production of 331,500 tons, the production-normalized effluent guidelines for zinc are 0.1 lbs/1,000 lbs as monthly average and 0.15 lbs/1,000 lbs as daily maximum.

Question:
What are the resulting zinc technology-based effluent limitations for the NPDES permit?

Answer:
The annual production would be converted to an average daily production rate to apply the effluent guidelines. To convert from the annual production rate to an average daily rate, divide the annual production rate by the number of production days per year. To determine the number of production days, subtract the total number of normally scheduled non-production days from the total days in a year. Because Company A normally has 255 production days per year, the annual production rate of 331,500 tons per year would yield an average production daily rate of 1,300 tons per day.

Monthly average discharge limitation for zinc*:

1,300 tons/day	x	2,000 lbs/ton	x	0.10 lbs/1,000 lbs	=	**260 lbs/day**

Daily maximum discharge limitation for zinc*:

1,300 tons/day	x	2,000 lbs/ton	x	0.15 lbs/1,000 lbs	=	**390 lbs/day**

* calculated to 2 significant figures

Calculating TBELs from Concentration-based Effluent Guidelines

Permit writers might want to develop mass-based limitations for facilities with concentration-based effluent guidelines (e.g., for a facility does not have adequate water conservation practices). Mass-based permit effluent limitations encourage water conservation (e.g., minimize the potential for diluting process wastewaters by non-process wastewater, more efficient use of water) and pollution prevention (e.g., reduce waste loads to wastewater treatment facilities by physically collecting solid materials before using water to clean equipment and facilities). Additionally, for facilities with on-site wastewater treatment systems, the combination of water-reduction technologies and practices and well-operated wastewater treatment will reduce the volume and mass of discharged wastewater pollution (i.e., after treatment). Another benefit of mass-based permit effluent limitations is that they provide the permittee with more flexibility. Permittees may elect to control their wastewater discharges through more efficient wastewater control technologies and pollution-prevention practices that result in lower pollutant concentrations in the

discharged wastewater, or more efficient water conservation practices that result in less wastewater volume discharged from industrial operations), or both.

"EPA strongly supports water conservation and encourages all sectors, including municipal, industrial, and agricultural, to achieve efficient water use. EPA does not intend for its regulations to present a barrier to efficient water use in any industrial sector." See final 2006 Effluent Guidelines Program Plan in 71 FR 76655, December 21, 2006.

When calculating mass-based effluent limitations, the permit writer should use a conversion factor and document in the fact sheet the conversion factors used to calculate the permit limitations (e.g., concentration [mg/L] × flow [mgd] × 8.34 [conversion factor] = permit limitation [lbs/day]).

Additionally, guidance for implementing concentration-based limitations in effluent guidelines may direct permit writers to develop mass-based TBELs. For example, the *Permit Guidance Document Transportation Equipment Cleaning Point Source Category (40 CFR 442)*[7] industry states:

> The effluent limitations guidelines and standards for the TEC industry are concentration-based and adhere to the *building block* concept. Each regulated wastestream in an outfall is typically assigned a mass-based discharge allowance based on a calculation of its applicable concentration-based limitation and annual average flow. The sum of the allowances is the total mass discharge allowance for the outfall. In other words, the applicable permit limitations for facilities in more than one subcategory is the sum of the mass loadings based upon production in each subcategory and the respective subcategory effluent limitations guidelines. Mass-based limitations for unregulated or dilution wastewater streams at direct discharging facilities are established using [BPJ].

Where a permit writer cannot determine a reasonable measure of actual flow for a regulated discharge, concentration-based TBELs may be determined by directly applying the concentration-based limitations in effluent guidelines to the regulated flow and accounting for non-regulated flows at the point of compliance for the TBELs.

Supplementing Mass-based TBELs with Concentration Limitations

Even where effluent guidelines require permit writers to calculate mass-based TBELs, a permit writer may determine that it is beneficial to include concentration-based limitations to supplement the mass-based limitations. Where effluent limitations are expressed in terms of mass, a provision at § 122.45(f)(2) allows the permit writer, at his or her discretion, to express limitations in additional units (e.g., concentration units). Where limitations are expressed in more than one unit, the permittee must comply with both. The permit writer may determine that expressing limitations in terms of both concentration and mass encourages the proper operation of a treatment facility at all times.

Supplementing mass-based limitations with concentration-based limitations may be especially appropriate where the requirements in the effluent guidelines are flow-normalized (i.e., the effluent guidelines includes a concentration requirement but directs the permit writer to calculate a mass-based TBEL using the concentration requirement and the wastewater flow). The permit writer may determine that if the permit includes only mass-based limitations derived from the concentration-based limitations in the effluent guidelines, a permittee could increase its effluent pollutant concentrations above the applicable concentration requirements during low flow periods (i.e., reduce the efficiency of the wastewater

treatment) and still meet its mass-based permit limitations. Supplementing the mass-based TBELs with concentration limitations would discourage the reduction in treatment efficiency during low-flow periods and require proper operation of treatment units at all times.

Incorporating Narrative Requirements from Effluent Guidelines

The permit writer should also ensure that any applicable narrative effluent guidelines controls or requirements are included in the permit. For example, the effluent guidelines for Concentrated Aquatic Animal Production facilities (Part 451) consist of narrative requirements implemented through BMPs. Another example, related to monitoring and compliance rather than effluent limitations, is found in the Metal Finishing effluent guidelines. The effluent guidelines allow a facility to make a statement regarding total toxic organics (TTO) in lieu of monitoring for toxic organics. Exhibit 5-15 provides an example narrative requirement representing BPT performance standards for Concentrated Aquatic Animal Production facilities, Subpart A (flow through and recirculating systems) § 455.11(a).

Exhibit 5-15 Example narrative requirement from the Concentrated Aquatic Animal Production effluent guideline—Subpart A [§ 455.11(a)]

Except as provided in [§§] 125.30 through 125.32, any existing point source subject to this subpart must meet the following requirements, expressed as practices (or any modification to these requirements as determined by the permitting authority based on its exercise of its best professional judgment) representing the application of BPT:

(a) Solids control. The permittee must:

(1) Employ efficient feed management and feeding strategies that limit feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth in order to minimize potential discharges of uneaten feed and waste products to waters of the [United States]

(2) In order to minimize the discharge of accumulated solids from settling ponds and basins and production systems, identify and implement procedures for routine cleaning of rearing units and off-line settling basins, and procedures to minimize any discharge of accumulated solids during the inventorying, grading and harvesting aquatic animals in the production system.

(3) Remove and dispose of aquatic animal mortalities properly on a regular basis to prevent discharge to waters of the [United States], except in cases where the permitting authority authorizes such discharge in order to benefit the aquatic environment.

5.2.2.6 Step 6: Account for Overlapping or Multiple Effluent Guidelines Requirements

There are instances when one facility includes both new and existing sources, produces multiple products or services, or includes production or services belonging to more than one category or subcategory. In such cases, the permit writer must examine the applicable effluent guidelines closely to ensure that (1) one guideline does not supersede another; and (2) the effluent guidelines are properly applied.

Superseding Effluent Guidelines

EPA tries to minimize the overlap of different effluent guidelines by providing exclusions in the applicability sections. The effluent guidelines in the Metal Finishing point source category (Part 433) are an example of where EPA has tried to minimize the overlap of multiple effluent guidelines for certain wastewater discharges. Exhibit 5-16 presents the applicability section in Part 433 [§ 433.10(b)], which specifically excludes certain wastewaters from the Metal Finishing effluent guidelines. Another example

is the preamble to the OCPSF effluent guidelines. The preamble identifies numerous circumstances where the OCPSF regulations are superseded by effluent guidelines for other industrial categories. Exhibit 5-17 presents excerpts from the preamble (52 FR 42523, November 5, 1987) to illustrate the point.

Exhibit 5-16 Exclusion of wastewaters in metal finishing effluent guidelines

In some cases, effluent limitations and standards for the following industrial categories might be effective and applicable to wastewater discharges from the metal finishing operations listed above [in paragraph (a)]. In such cases these Part 433 limitations shall not apply and the following regulations shall apply: [emphasis added]

- Nonferrous metal smelting and refining (40 CFR part 421)
- Coil coating (40 CFR Part 465)
- Porcelain enameling (40 CFR Part 466)
- Battery manufacturing (40 CFR Part 461)
- Iron and steel (40 CFR Part 420)
- Metal casting foundries (40 CFR Part 464)
- Aluminum forming (40 CFR Part 467)
- Copper forming (40 CFR Part 468)
- Plastic molding and forming (40 CFR Part 463)
- Nonferrous forming (40 CFR Part 471)
- Electrical and electronic components (40 CFR Part 469)

Exhibit 5-17 Excerpts from preamble to OCPSF effluent guidelines regarding applicability of effluent guidelines

- For the purposes of this regulation, OCPSF process wastewater discharges are defined as discharges from all establishments or portions of establishments that manufacture products or product groups listed in the applicability sections of this regulation, and are included within the following U.S. Department of Commerce Bureau of the Census Standard Industrial Classification (SIC) major groups:
  - SIC 2865: Cyclic Crudes and Intermediates, Dyes, and Organic Pigments.
  - SIC 2869: Industrial Organic Chemicals, not Elsewhere Classified.
  - SIC 2821: Plastic Materials, Synthetic Resins, and Nonvulcanizable Elastomers.
  - SIC 2823: Cellulosic Man-Made Fibers.
  - SIC 2824: Synthetic Organic Fibers, Except Cellulosic.

  The OCPSF regulation does not apply to process wastewater discharges from the manufacture of organic chemical compounds solely by extraction from plant and animal raw materials or by fermentation processes.
- The OCPSF regulation does not apply to discharges from OCPSF product/process operations [that] are covered by the provisions of other categorical industry effluent limitations guidelines and standards if the wastewater is treated in combination with the non-OCPSF industrial category regulated wastewater. (Different processes manufacture some products or product groups and some processes with slight operation condition variations give different products. EPA uses the term *product/process* to mean different variations of the same basic process to manufacture different products as well as to manufacture the same product using different processes.)
- The process wastewater discharges by petroleum refineries and pharmaceutical manufacturers from production of organic chemical products specifically covered by 40 CFR Part 419 Subparts C and E and Part 439 Subpart C, respectively, that are treated in combination with other petroleum refinery or pharmaceutical manufacturing wastewater, respectively, are not subject to the OCPSF regulation no matter what SIC code they use to report their products.
- Today's OCPSF category regulation applies to plastics molding and forming processes when plastic resin manufacturers mold or form crude intermediate plastic material for shipment off-site. The regulation also applies to the extrusion of fibers. Plastics molding and forming processes, other than those described above are regulated by the Plastics Molding and Forming effluent guidelines and standards (40 CFR Part 463).

Exhibit 5-17 Excerpts from preamble to OCPSF effluent guidelines regarding applicability of effluent guidelines (continued)

- Public comments requested guidance relating to the coverage of OCPSF research and development facilities, standalone OCPSF research and development, pilot plant, technical service, and laboratory bench scale-operations are not covered by the OCSPF regulation. However, wastewater from such operations conducted in conjunction with and related to existing OCPSF manufacturing operations at OCPSF facilities is covered by the OCPSF regulation because these operations would most likely generate wastewater with characteristics similar to the commercial manufacturing facility. Research and development, pilot plant technical service, and laboratory operations [that] are unrelated to existing OCPSF plant operations, even though conducted on-site, are not covered by the OCPSF regulation because they may generate wastewater with characteristic dissimilar to that from the commercial OCPSF manufacturing facility.
- Finally, as described in the following paragraphs, this regulation does not cover certain production that has historically been reported to the Bureau of Census under a non-OCPSF SIC subgroup heading, even if such production could be reported under one of the five SIC code groups covered by today's regulation.

Multiple Effluent Guidelines Requirements

NPDES permit writers often find that a facility employs multiple processes each with its own effluent guidelines requirement. In addition, sometimes effluent guidelines from multiple categories and subcategories apply to wastewaters for a single facility. When a facility is subject to effluent guidelines for two or more processes in a subcategory or to effluent guidelines from two or more categories or subcategories, the permit writer must apply each of the applicable effluent guidelines to derive TBELs. In applying multiple effluent guidelines, the permit writer should use measures of actual production or flow that are reasonable with respect to operation of multiple processes at the same time. For example, if maximum production for one process can occur only when there is reduced production for a second process, it might not be reasonable to assume maximum production levels for both processes at the same time when applying the effluent guidelines. If all wastewaters regulated by effluent guidelines are treated separately but are combined before the discharge, the permit writer may establish internal outfalls and separately apply the effluent guidelines at the respective internal outfall as discussed in § 122.45(h) and in Step 7 below.

More commonly, wastewater streams regulated by effluent guidelines are combined during or before treatment. In such a case, the permit writer combines the allowable pollutant loadings from each set of requirements or from each set of effluent guidelines to arrive at a single TBEL for the facility using a *building block* approach. The building block approach as applied to a facility with multiple processes in the Primary Tungsten subcategory of the Primary Nonferrous Metals Manufacturing point source category (Part 421, Subpart J) is presented in Exhibit 5-18. The same principles illustrated in the exhibit would apply to a facility with processes subject to requirements from multiple subcategories or categories that are combined before or during treatment.

Exhibit 5-18 Building block approach for applying effluent guidelines

A facility is subject to Part 421, Subpart J (Primary Tungsten). The facility uses a tungstic acid rinse, an acid leach wet air pollution control system, and an alkali leach wash in its manufacturing process.

The Maximum daily production rate for the facility is:
4.7 million pounds per day of Tungstic Acid (as W)
3.5 million pounds per day of Sodium Tungstate (as W)

Question:
What is the technology-based effluent limit for lead at the facility?

Answer:
BPT calculation for lead (§ 421.102):

a) **Tungstic acid rinse:**
(4.7 million lbs/day) × (17.230 lbs/million lbs) = 80.981 lbs/day

b) **Acid leach wet air pollution control:**
(4.7 million lbs/day) × (15.040 lbs/million lbs) = 70.688 lbs/day

c) **Alkali leach wash:**
(3.5 million lbs/day) × (0.000 lbs/million lbs) = 0.000 lbs/day

d) **Total allowable discharge** = 80.981 + 70.688 + 0.000 = 151.669 = **152 lbs/day**

BAT calculation for lead (§ 421.103):

a) **Tungstic acid rinse:**
(4.7 million lbs/day) × (11.490 lbs/million lbs) = 54.003 lbs/day

b) **Acid leach wet air pollution control:**
(4.7 million lbs/day) × (1.003 lbs/million lbs) = 4.7141 lbs/day

c) **Alkali leach wash:**
(3.5 million lbs/day) × (0.000 lbs/million lbs) = 0.000 lbs/day

d) **Total allowable discharge** = 54.003 + 4.7141 + 0.000 = 58.7171 = **59 lbs/day***

The technology-based maximum daily limitation for lead at the facility is the BAT limitation of **59 lbs/day**. That value is compared with the water quality-based effluent limitation for lead, to ensure that all applicable standards are implemented through the final effluent limitations.

* calculated to 2 significant figures

The building block approach is applied in other circumstances as well, such as

- **Mixture of mass-based and concentration-based requirements:** The limitations in effluent guidelines for some pollutants are mass-based, production-normalized limitations in some subparts and concentration-based limitations in other subparts. When all the wastewater streams go to the same treatment system, the permit writer would need to convert the concentration-based limitations to mass-based limitations so they could be combined with the mass-based, production-normalized limitations and applied to the combined wastewater streams.
- **Mixture of different concentration-based requirements:** Some facilities could have multiple operations that are each subject to different concentration-based requirements for the same pollutant but with wastewater streams that combine before treatment. In such a case, the permit writer can establish a flow-weighted concentration-based limitation as the TBEL for the combined wastewater streams or convert the concentration-based requirements to equivalent mass-based requirements using flow data and then combine the mass-based requirements into a single limitation for the combined wastewater streams.

- **Mixture of regulated and unregulated wastewater streams:** In some cases, wastewater streams containing a pollutant regulated by the applicable effluent guidelines requirements can combine with other wastewater streams that do not have effluent guidelines requirements that regulate the pollutant. In such a case, the permit writer could use BPJ to establish a TBEL for the unregulated wastewater stream(s) (see section 5.2.3 below) and, as appropriate, calculate a final TBEL for the combined wastewater streams. For example, if one of the wastewater streams contributing to an industrial facility's discharge is sanitary wastewater, the permit writer might use BPJ to apply the treatment standards for domestic wastewater and calculate BOD_5 limitations for that wastewater stream. The secondary treatment standards, discussed in section 5.1 above, could be used to calculate mass-based limits for the sanitary wastewater using the concentration-based requirements and an estimate of flow rate that is expected to represent the flow rate during the proposed permit term. A final TBEL for BOD_5 could be calculated for the combined sanitary and process wastewater streams by combining the two mass limitations using the building block approach.
- **Mixture of wastewater streams containing a pollutant with wastewater streams not containing the pollutant:** If a wastewater stream that does not contain a pollutant is combined with another wastewater stream that contains the pollutant (and has applicable requirements in the effluent guidelines or requirements determined by the permit writer using BPJ), the permit writer must ensure that the non-regulated waste stream does not dilute the regulated waste stream to the point where the pollutant is not analytically detectable. If that occurs, the permit writer will most likely need to establish internal outfalls, as allowed under § 122.45(h) and in Step 7 below.

For examples of addressing combined wastewater streams, see section 15.3.3 on page 15-10 of EPA's *Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432)*[8] <www.epa.gov/waterscience/guide/mpp/final/tdd15.pdf>.

Facilities with Both New and Existing Sources

Finally, as noted above, if effluent guidelines are applicable to an existing facility, and that facility adds a new production line, which becomes a *new source*, the permit writer should calculate TBELs for the subsequent permit using BPT, BCT, and BAT standards for the existing production line and NSPS for the new production line, as discussed in section 5.2.2.4 above.

5.2.2.7 Step 7: Apply Additional Regulatory Considerations in Calculating TBELs

The permit writer must consider several additional requirements when deriving TBELs from effluent guidelines. Those additional requirements consist of evaluating or accounting for the following:

- Expected significant increases or decreases in production during the permit term for tiered discharger limitations.
- Internal outfalls.
- Requests for a variance from effluent guidelines.

The following sections provide an overview of those topics.

Tiered Discharge Limitations

If production rates are expected to change significantly during the life of the permit, the permit writer can include tiered (alternate) TBELs as allowed by § 122.45(b)(2)(ii)(A)(i). Tiered TBELs would apply to mass-based effluent limitations and would become effective when production or flow (or some other measure of production) exceeded a threshold value, such as during seasonal production variations. Generally, up to a 20 percent fluctuation in production is considered to be within the range of normal variability, while changes in production higher than 20 percent could warrant consideration of tiered limitations. Exhibit 5-19 illustrates application of tiered limitations.

Exhibit 5-19 Example of tiered discharge limitations

Plant B produced approximately 40 tons per day of product during spring and summer months (i.e., March through August) and 280 tons per day during fall and winter months during the previous 5 years. Production during the fall and winter months is significantly higher than during the off-season, and the discharger has made a plausible argument that production is expected to continue at that level. The effluent guidelines requirements for Pollutant Z are 0.08 lbs/1,000 lbs for the average monthly limitation and 0.14 lbs/1,000 lbs for the maximum daily limitation.

Question:
What are appropriate tiered effluent limitations for Plant B?

Answer:
The first tier or lower limitations would be based on a production rate of 40 tons per day. The limitations would apply between March and August.

Monthly average limitation:
40 tons/day × 2,000 lbs/ton x 0.08 lbs/1,000 lbs = **6.4 lbs/day***

Daily maximum limitation:
40 tons/day × 2,000 lbs/ton x 0.14 lbs/1,000 lbs = 11.2 lbs/day = **11 lbs/day***

The second tier or higher limitations would be based on a production rate of 280 tons per day. Those limitations would apply between September and February.

Monthly average limitation:
280 tons/day × 2,000 lbs/ton x 0.08 lbs/1,000 lbs = 44.8 lbs/day = **45 lbs/day***

Daily maximum limitation
280 tons/day × 2,000 lbs/ton x 0.14 lbs/1,000 lbs = 78.4 lbs/day = **78 lbs/day***

* calculated to 2 significant figures

Permit writers should include tiered limitations in a permit only after careful consideration of production data and only when a substantial increase or decrease in production is likely to occur. In the example above, the lower limitations would be in effect when production was at low levels (March through August). During periods of significantly higher production (September through February), the higher limitations would be in effect. In addition, a tiered or alternate set of limitations might be appropriate in the case of special processes or product lines that operate during certain times only.

Permit writers could base thresholds for tiered limitations on an expected increase in production during the term of the permit that will continue through the duration of the permit term. For example, if a facility plans to add a process line and significantly expand production in year 3 of the permit term, the permit could specify a higher tier of limitations that go into effect when the facility reports reaching a production level specified in the permit.

Permit writers must detail in the permit the thresholds and time frames when each tier applies, measures of production, and special reporting requirements. Special reporting requirements include provisions such as the following:

- The facility notifying the permitting authority a specified number of business days before the month it expects to be operating at a higher level of production and the duration this level of production is expected to continue.
- The facility reporting, in the discharge monitoring report, the level of production and the limitation and standards applicable to that level.

A detailed discussion of the rationale and requirements for any tiered limitations should be provided in the fact sheet for the permit.

Internal Outfalls

The NPDES regulations at § 122.45(h) give NPDES permit writers the authority to identify internal outfalls when effluent limitations at the final outfall are impractical or infeasible. These internal compliance points might be necessary to ensure proper treatment of persistent, bioaccumulative, and toxic pollutants that are discharged in concentrations below analytic detection levels at the final effluent outfall or other pollutants that may be diluted by flows (e.g., cooling water) not containing the pollutant. Some effluent guidelines may *require* the use of internal outfalls unless the effluent limitations are adjusted based on the dilution ratio of the process wastewater to the wastewater flow at the compliance point. Examples of effluent guidelines with required internal compliance points include the Metal Finishing effluent guidelines (Part 433) and the Pulp, Paper, and Paperboard effluent guidelines (Part 430). Accordingly, the permit writer should identify any internal outfall monitoring that might be required by the applicable effluent guidelines and include monitoring requirements in the final permit.

Effluent Guidelines Variances

The CWA and federal regulations provide limited mechanisms for variances from requirements in effluent guidelines. An NPDES permit applicant must meet very specific data and variance application deadline requirements before a variance may be granted. A variance provides a unique exception to a particular requirement, and the permit writer should not expect to routinely receive variance requests. Nevertheless, the permit writer should be aware of the major types of variances and the basic requirements for each, because the permit writer will most likely be the person to conduct the initial reviews of such requests before submitting them for review to the State Director (if applicable) or to EPA.

Variance applications are submitted by the NPDES permit applicant and must be submitted before the close of the public comment period of the permit, except for Fundamentally Different Factors (FDF) variance requests, which must be requested by the NPDES permit applicant within 180 days of the effluent guidelines publication. The permit writer should consult § 124.62 for the specific procedures for decisions regarding various types of variances. Exhibit 5-20 lists the available variances from effluent guidelines.

Exhibit 5-20 Variances from effluent guidelines

Legislation (CWA section)	Type	Regulation (40 CFR)	Approval authority	Application deadline
301(g)	Nonconventional Pollutant	Part 125, Subpart F (Reserved)	EPA Region HQ delegated authority	During permit comment period
301(n)	Fundamentally Different Factors (FDF)	Part 125, Subpart D	EPA Region HQ delegated authority	180 days from the date the limitation or standard is published in the FR
—	Net Intake or Net/Gross	§ 122.45(g)	NPDES state or EPA Region in absence of approved state NPDES program	During permit comment period

The following paragraphs further discuss the variances listed in Exhibit 5-20 and the factors that are considered in a technical review of a variance request.

Nonconventional Pollutant—CWA Section 301(g) Variance

CWA section 301(g) and the regulations at § 122.21(m)(2) provide for a variance from new or revised BAT effluent guidelines for certain nonconventional pollutants because of local environmental factors, so long as the discharger demonstrates that it is meeting BPT and that the discharge does not prevent attainment of water quality standards and would not result in additional requirements on other point or nonpoint sources. The pollutants for which a facility may request a CWA section 301(g) variance are ammonia, chlorine, color, iron, and phenols (as measured by the colorimetric 4-aminoantipyrine [4AAP] method). The CWA also provides a process to petition to include additional pollutants on this list. Industries with facilities that have applied for CWA section 301(g) variances include Iron and Steel Manufacturing (Part 420), Steam Electric Power Generating (Part 423), Inorganic Chemicals Manufacturing (Part 415), Nonferrous Metals Manufacturing (Part 421), Aluminum Forming (Part 467), and Pesticides Chemicals (Part 455) facilities.

In addition to meeting the application deadline, the discharger must file a variance application that meets the following requirements:

- The proposed modified requirements must result in compliance with BPT and water quality standards of the receiving stream.
- No additional treatment will be required of other point or nonpoint source dischargers as a result of the variance approval.
- The modified requirements will not interfere with attainment or maintenance of water quality to protect public water supplies, or with protection and propagation of a balanced population of shellfish, fish, and wildfowl, and will allow recreational activities in and on the water.
- The modified requirements will not result in quantities of pollutants that can reasonably be anticipated to pose an unacceptable risk to human health or the environment, cause acute or chronic toxicity, or promote synergistic properties.

The permit writer should review the request to ensure that it complies with each of the requirements for this type of variance. This variance request can involve a great deal of water quality assessment, including aquatic toxicity, mixing zone and dilution model analysis, and possible site-specific criterion development. In addition, it might be necessary to assess many complex human health effects, including carcinogenicity, teratogenicity, mutagenicity, bioaccumulation, and synergistic propensities. Permit writers may use EPA's *Draft Technical Guidance Manual for the Regulations Promulgated Pursuant to Section 301(g) of the Clean Water Act of 1977 40 CFR Part 125 (Subpart F)* <www.epa.gov/npdes/pubs/owm0008.pdf> to assess a completed variance request.

Fundamentally Different Factors—FDF Variance

Alternative effluent limitations or standards different from the otherwise applicable requirements in effluent guidelines may be authorized by EPA if an individual facility is fundamentally different with respect to factors considered in establishing the limitations or standards otherwise applicable to that facility's industrial category. Such a modification is known as a *fundamentally different factors* (FDF) variance.

Facilities must submit all FDF variance applications to the appropriate Director, as defined at § 122.2, no later than 180 days from the date the limitations or standards are published in the FR [see CWA section 301(n)(2) and § 122.21(m)(1)(i)(B)(2)]. An FDF variance is not available to a new source subject to NSPS.

EPA regulations at Part 125, Subpart D, authorizing the EPA Regional Administrators to establish alternative limitations and standards, further detail the substantive criteria used to evaluate FDF variance requests for direct dischargers. The regulations at § 125.31(d) identify six factors that may be considered in determining if a facility is fundamentally different:

- Nature or quality of pollutants contained in the raw process wastewater.
- Volume of the process wastewater and effluent discharged.
- Non-water quality environmental impact of control and treatment of the raw wasteload.
- Energy requirements of the application of control and treatment technology.
- Age, size, land availability, and configurations of discharger's equipment or facilities as well as processes employed, process changes, and engineering aspects of the application of control technology.
- Cost of compliance with required control technology.

The Agency must determine whether, on the basis of one or more of those six factors, the facility in question is fundamentally different from the facilities and factors considered by EPA in developing the nationally applicable effluent guidelines. The regulation also lists four other factors that may not provide a basis for an FDF variance:

- Infeasibility of installation within the time allowed by the CWA.
- Assertion that the national limitations cannot be achieved with the appropriate waste treatment facilities installed (if the assertion is not based on one or more of the six FDF factors above).
- A discharger's ability to pay for the required water treatment.

- The impact of a discharge on local receiving water quality.

In addition, under § 125.31(b)(3), a request for limitations less stringent than the national limitation may be approved only if compliance with the national limitations would result in either of the following:

- Removal cost wholly out of proportion to the removal cost considered during development of the national limitations.
- Non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the national limitations.

The conditions for approval of a request to modify applicable pretreatment standards and factors considered are the same as those for direct dischargers.

The legislative history of CWA section 301(n) underscores the necessity for the FDF variance applicant to establish eligibility for the variance. EPA's regulations at § 125.32(b)(1) are explicit in imposing that burden on the applicant. The applicant must show that the factors relating to the discharge controlled by the applicant's permit, which are claimed to be fundamentally different are, in fact, fundamentally different from those factors considered by the EPA in establishing the applicable effluent guidelines. The pretreatment regulations incorporate a similar requirement at § 403.13(h)(9).

Intake Allowance or Net/Gross Variance

Some facilities might be unable to comply with effluent guidelines because of pollutants in their intake water. Under certain circumstances, the NPDES regulations allow credit for pollutants in intake water. Specifically, permit writers are authorized to grant net credits for the quantity of pollutants in the intake water where (1) the applicable effluent guidelines specify that the guidelines are to be applied on a net basis; or (2) the pollution control technology would, if properly installed and operated, meet applicable effluent guidelines without the pollutants in the intake waters. The following requirements are included in § 122.45(g) for establishing net limitations:

- Credit for conventional pollutants, such as BOD_5 or TSS, are only authorized where the constituents resulting in the effluent BOD_5 and the TSS are similar between the intake water and the discharge.
- Credit is authorized only up to the extent necessary to meet the applicable limitation or standard, with a maximum value equal to the influent concentration.
- Intake water must be taken from the same body of water into which the discharge is made.
- Net credits do not apply to the discharge of raw water clarifier sludge generated during the treatment of intake water.

Permit writers must include influent monitoring in the permit when this type of variance is granted.

Thermal Discharge—CWA Section 316(a) Variance

CWA section 316(a) and the regulations at § 122.21(m)(6) provide for variances from thermal effluent limitations in NPDES permits. EPA has only promulgated thermal limitations in effluent guidelines for two industrial sectors: Beet Sugar Processing Subcategory of the Sugar Processing Point Source Category (Part 409 Subpart A) and the Cement Manufacturing Point Source Category (Part 411, Subparts A and B).

Most thermal limitations are based on water quality standards, so most thermal variances actually are not true *technology-based* variances. Dischargers must apply for a thermal discharge variance with its permit application if the thermal effluent limitation is based on an effluent guideline or during the permit comment period if the thermal effluent limitation is based on a WQBEL.

Regulations for submitting and reviewing thermal discharge variance requests are promulgated at Part 125, Subpart H. The approval authority for a thermal discharge variance request is the state permitting authority or the EPA Region if there is no approved state NPDES program. Less stringent alternative thermal effluent limitations may be included in permits if the discharger properly demonstrates that such effluent limitations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is made, taking into account the cumulative impact of its thermal discharge together with all other significant impacts on the species affected. Once a variance is granted, the discharger must still reapply for the variance each permit term. The majority of thermal variance requests are from power plants seeking relief from water-quality based effluent limitations.

Climate Change Considerations

Evaluation of requests for variances under CWA section 316(a) requires consideration of the change to the ambient water temperature because of an effluent discharge. The studies provided by applicants to support their requests frequently include historical thermal data for the receiving water. Permitting authorities should be aware that the effects of global climate change could alter the thermal profile of some receiving waters making the historical record of thermal conditions less representative of future conditions. Where appropriate, water quality models should take these potential changes into account.

5.2.2.8 Step 8: Apply Additional Requirements in Effluent Guidelines

The effluent guidelines could provide additional requirements for permit writers to consider when applying them in NPDES permits.

Industrial Stormwater

Industrial stormwater is sometimes regulated by effluent guidelines. In particular, effluent guidelines often regulate stormwater for industrial activities that are unsheltered (e.g., mining, outdoor processing, outside storage of product materials). Examples of contaminated stormwater regulated by effluent guidelines include the Concentrated Animal Feeding Operations (Part 412), Fertilizer Manufacturing (Part 418), Petroleum Refining (Part 419), Iron and Steel Manufacturing (Part 420), Pulp, Paper, and Paperboard (Part 430), Metal Products and Machinery (Part 438), and Ore Mining and Dressing (Part 440) point source categories. The permit writer should identify any specific stormwater controls that may be required by the applicable effluent guidelines accordingly.

Stormwater not regulated by effluent guidelines that is commingled with process wastewater will require the adjustment of the effluent limitations as discussed in Step 6 above. Section 2.3.2.3 of this manual provides additional information about stormwater discharges associated with industrial activities.

Identify the Analytical Methods for Measuring Compliance with TBELs

The permit writer should ensure that the permit specifies the use of the correct analytical methods for demonstrating compliance with TBELs derived from effluent guidelines. The effluent guidelines often require specific analytical methods. For example, the *General Definitions* section of the Meat and Poultry Products effluent guidelines [§ 432.2(l)] states, "The approved methods of analysis for the following six parameters [Ammonia (as N), BOD_5, Oil and Grease (O&G), O&G as hexane extractable material (HEM), Total Nitrogen, TSS] are found in Table 1B in [§] 136.3. The nitrate/nitrite part of total nitrogen may also be measured by EPA Method 300.0 (incorporated by reference, see § 432.5)." Section 8.3 of this manual provides additional information on analytical methods in the NPDES permitting process.

Documentation and Recordkeeping Requirements

Specific documentation and recordkeeping requirements (e.g., solvent management plans, BMP plans, alternative monitoring requirements) may be included in the applicable effluent guidelines. The permit writer should ensure that the documentation and recordkeeping requirements are included in the NPDES permit. For example, to use the alternative monitoring compliance method for controlling toxic organics in the Metal Finishing effluent guidelines, the NPDES permit applicant must not only make a certification statement (see Exhibit 5-15), but must also "submit a solvent management plan that specifies to the satisfaction of the permitting authority (or, in the case of indirect dischargers, the control authority) the toxic organic compounds used; the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration; and procedures for ensuring that toxic organics do not routinely spill or leak into the wastewater" as required by § 433.12(b). Other examples of such documentation and recordkeeping requirements include the BMP Plans used in the Oil and Gas Extraction (Part 435) and the Concentrated Aquatic Animal Production effluent guidelines (Part 451), the pollution prevention alternative in the Pesticide Chemicals effluent guidelines (Part 455), and alternative monitoring requirements (e.g., certification in lieu of monitoring for chloroform, in the Pulp, Paper, and Paperboard effluent guidelines (Part 430).

5.2.2.9 Step 9: Document the Application of Effluent Guidelines in the Fact Sheet

Permit writers need to document their application of effluent guidelines in the NPDES permit fact sheet. The permit writer should clearly identify the data and information used to determine the applicable effluent guidelines and how that information was used to derive effluent limitations for the permit. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the NPDES permit properly incorporates effluent guidelines.

Similarly, permit writer should also document the rationale for concluding that there are no applicable effluent guidelines for a discharge or pollutant. In such cases, TBELs may be determined by the permit writer on a case-by-case basis as discussed in section 5.2.3 below.

5.2.3 Case-by-Case TBELs for Industrial Dischargers

As previously stated, § 125.3(a) indicates that technology-based treatment requirements under CWA section 301(b) represent the minimum level of control that must be imposed in an NPDES permit.

Where EPA-promulgated effluent guidelines are not applicable to a non-POTW discharge, such requirements are established on a case-by-case basis using BPJ.

5.2.3.1 Legal Authority to Establish Case-by-Case TBELs

Case-by-case TBELs are developed pursuant to CWA section 402(a)(1), which authorizes the EPA Administrator to issue a permit that will meet either all applicable requirements developed under the authority of other sections of the CWA (e.g., technology-based treatment standards, water quality standards, ocean discharge criteria) or, before taking the necessary implementing actions related to those requirements, "such conditions as the Administrator determines are necessary to carry out the provisions of this Act." The regulation at § 125.3(c)(2) specifically cites this section of the CWA, stating that technology-based treatment requirements may be imposed in a permit "on a case-by-case basis under section 402(a)(1) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable." Further, § 125.3(c)(3) indicates that "where promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis to carry out the provisions of the Act." When establishing case-by-case effluent limitations using BPJ, the permit writer should cite in the fact sheet or statement of basis both the approach used to develop the limitations, which is discussed further below, and how the limitations carry out the intent and requirements of the CWA and the NPDES regulations.

5.2.3.2 Identifying the Need for Case-by-Case TBELs

As noted above, case-by-case TBELs are established in situations where EPA promulgated effluent guidelines are inapplicable. That includes situations such as the following:

- When EPA has not yet promulgated effluent guidelines for the point source category to which a facility belongs (e.g., a facility that produced distilled and blended liquors [SIC code 2085] and is part of the miscellaneous foods and beverages category, which does not now have any applicable effluent guidelines).
- When effluent guidelines are available for the industry category, but no effluent guidelines are available for the facility subcategory (e.g., discharges from coalbed methane wells are not now regulated by effluent guidelines; however, EPA considers the coalbed methane industrial sector as a potential new subcategory of the existing Oil and Gas Extraction point source category [Part 435] because of the similar industrial operations performed [i.e., drilling for natural gas extraction]).
- When effluent guidelines are available for the industry category but are not applicable to the NPDES permit applicant (e.g., facilities that do not perform the industrial operation triggering applicability of the effluent guidelines or do not meet the production or wastewater flow cutoff applicability thresholds of the effluent guidelines). For example, assume that the poultry slaughterhouse in Example 2 of Exhibit 5-13 above produces 50 million pounds of whole, halved, quarter or smaller meat cuts annually. In that case, any TBELs for the facility would be case-by-case limitations developed using BPJ because the facility is below the annual production threshold of 100 million pounds listed in the effluent guideline (Part 432, Subpart K).
- When effluent guidelines are available for the industry category, but no effluent guidelines requirements are available for the pollutant of concern (e.g., a facility is regulated by the effluent guidelines for Pesticide Chemicals [Part 455] but discharges a pesticide that is not regulated by

these effluent guidelines). The permit writer should make sure that the pollutant of concern is not already controlled by the effluent guidelines and was not considered by EPA when the Agency developed the effluent guidelines.

Generally, case-by-case limitations are appropriate when at least one of the conditions listed above applies and the pollutant is present, or expected to be present, in the discharge in amounts that can be treated or otherwise removed (e.g., implementation of pollution prevention measures). The resources listed in sections 5.2.2.2 above and 5.2.3.4 below will help the permit writer in making such determinations. For example, EPA's effluent guidelines planning support documents on EPA's Effluent Guidelines Biennial Plan Website <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> identify facilities and industrial sectors that currently are not regulated by effluent guidelines.

5.2.3.3 Factors Considered When Developing Case-by-Case TBELs

The NPDES regulations at § 125.3(c)(2) require that permit writers developing case-by-case effluent limitations consider the following:

- The appropriate technology for the category class of point sources of which the applicant is a member, based on all available information.
- Any unique factors relating to the applicant.

The regulations also require that, in setting case-by-case limitations, the permit writer consider several specific factors established in § 125.3(d) to select a model treatment technology and derive effluent limitations on the basis of that treatment technology. That process and the factors considered by the permit writer are the same factors required to be considered by EPA in developing effluent guidelines and, therefore, are often referred to as the CWA section 304(b) factors. The factors are summarized below in Exhibit 5-21. The permit writer evaluates case-by-case limitations based on BPT, BCT, and BAT and uses the more stringent technology level of control for each pollutant of concern.

Exhibit 5-21 Summary of factors considered when developing case-by-case TBELs

For BPT requirements (all pollutants)
- The age of equipment and facilities involved*
- The process(es) employed*
- The engineering aspects of the application of various types of control techniques*
- Process changes*
- Non-water quality environmental impact including energy requirements*
- The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application

For BCT requirements (conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The reasonableness of the relationship between the costs of attaining a reduction in effluent and the derived effluent reduction benefits
- The comparison of the cost and level of reduction of such pollutants from the discharge of POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources

For BAT requirements (toxic and non-conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The cost of achieving such effluent reduction

The CWA also gives the permit writer the authority to consider process changes to evaluate case-by-case limitations. As previously stated, technology-based controls in NPDES permits are performance-based measures. EPA incorporates technology-based controls in NPDES permits that correspond to the application of an identified technology (including process changes) but does not require dischargers to install the identified technology. Therefore, EPA leaves to each facility the discretion to select the technology design or process changes necessary to meet the TBELs specified in the NPDES permit.

The permit writer might need to establish a monitoring-only requirement in the current NPDES permit to identify pollutants of concern and potential case-by-case limitations for the subsequent NPDES permit renewal.

5.2.3.4 Resources for Developing Case-by-Case TBELs

There are numerous resources for identifying candidates for model technologies or process changes and developing case-by-case TBELs using BPJ. Exhibit 5-22 lists some example references that permit writers can use to derive such limitations.

5.2.3.5 Statistical Considerations When Establishing Case-by-Case TBELs

The quality of the effluent from a treatment facility will normally vary over time. If, for example, BOD_5 data for a typical treatment plant were plotted against time, one would observe day-to-day variations of effluent concentrations. Some of that behavior can be described by constructing a frequency-concentration plot. From the plot, one could observe that for most of the time, BOD_5 concentrations are near some average value. Any treatment system can be described using the mean concentration of the parameter of interest (i.e., the long-term average) and the variance (or coefficient of variation) and by assuming a particular statistical distribution (usually lognormal).

When developing a case-by-case limitation, permit writers can use an approach consistent with the statistical approach EPA has used to develop effluent guidelines. Specifically, the maximum daily limitation could be calculated by multiplying the long-term average achievable by implementation of the model technology or process change by a daily variability factor determined from the statistical properties of a lognormal distribution. The average monthly limitation can be calculated similarly except that the variability factor corresponds to the distribution of monthly averages instead of daily concentration measurements. The daily variability factor is a statistical factor defined as the ratio of the estimated 99th percentile of a distribution of daily values divided by the mean of the distribution. Similarly, the monthly variability factor is typically defined as the estimated 95th percentile of the distribution of monthly averages divided by the mean of the distribution of monthly averages.

A modified delta-lognormal distribution could be fit to concentration data and variability factors computed for the facility distribution. The modified delta-lognormal distribution models the data as a mixture of measured values and observations recorded as values less than the detectable level. This distribution often is selected because the data for many analytes consist of such a mixture of measured values and results below the detectable level. The modified delta-lognormal distribution assumes that all non-detected results have a value equal to the detection limitations and that the detected values follow a lognormal distribution.

Exhibit 5-22 Tools for developing case-by-case TBELs using BPJ

Permit file information
- Current and previous NPDES application forms.
- Previous NPDES permit and fact sheet.
- Discharge monitoring reports.
- Compliance inspection reports.

Information from existing facilities and permits
- NPDES Individual and General Permits for other NPDES permits issued to facilities in the same region or state, or that include case-by-case limitations for the same pollutants.
- Toxicity reduction evaluations for selected industries.
- Other media permit files (e.g., Resource Conservation and Recovery Act [RCRA] permit applications and Spill Prevention Countermeasure and Control [SPCC] plans.
- ICIS-NPDES <https://icis.epa.gov/icis> data.
- Literature (e.g., technical journals and books).

Effluent guidelines development and planning information
- Industry experts within EPA headquarters, EPA Regions, and states <www.epa.gov/guide/contacts.html>.
- Development Documents, CWA section 308 questionnaires, screening and verification data, proposed and final regulations, contractor's reports, and project officer contacts <www.epa.gov/guide>.
- EPA's Technical Support Documents <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> and records supporting EPA's biennial effluent guidelines program plans also provide additional useful information. In particular, such resources provide a sample of the current limitation and latest developments in industrial pollutant prevention, water conservation, and wastewater treatment. The Technical Support Documents also identify industrial sectors not currently regulated by effluent guidelines.

Statistical guidance
- Effluent Guidelines Technical Development Support Documents, such as the Development Document for Final Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category <www.epa.gov/guide/>.

Economics guidance
- *Protocol and Workbook for Determining Economic Achievability for NPDES Permits*[9] <www.epa.gov/npdes/pubs/protocol_npdespermits.pdf> and <www.epa.gov/npdes/pubs/workbook_econ_permits.pdf>.
- *BCT Cost Test Guidance* <www.epa.gov/npdes/pubs/owm0009.pdf>.

Guidance for BMP-based limitations
- *Guidance Manual for Developing Best Management Practices (BMPs)*[10] <www.epa.gov/npdes/pubs/owm0274.pdf>.
- *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and BMPs*[11] <www.epa.gov/npdes/pubs/contents_indguide.pdf>.
- National Menu of Stormwater Best Management Practices <www.epa.gov/npdes/stormwater/menuofbmps>.

For more details on EPA's use of statistical methods for developing effluent guidelines, refer to *Development Document for Final Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category* <www.epa.gov/guide/ironsteel/reg/tdd.htm>.

5.2.3.6 Documenting Case-by-Case TBELs in the Permit Fact Sheet

Permit writers will need to document the development of case-by-case limitations in the NPDES permit fact sheet. The permit writer should clearly identify the data and information used in developing these effluent limitations and how that information was used. The permit writer also should document the rationale for concluding that there are no applicable effluent guidelines for the industrial wastewater or pollutant discharge. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the BPJ limitations comply with the CWA and EPA regulations.

[1] U.S. Environmental Protection Agency. 1985. *Draft Guidance for NPDES Permits and Compliance Personnel—Secondary Treatment Redefinition.* U.S. Environmental Protection Agency. Office of Water Enforcement and Permits. Washington, DC.

[2] U.S. Environmental Protection Agency. 1994. *Amended Section 301(h) Technical Support Document*. EPA-842-B-94-007. U.S. Environmental Protection Agency. Office of Wetlands Oceans and Watersheds, Washington, DC.

[3] U.S. Environmental Protection Agency. 1977. *Interim Final Supplement for Pretreatment to the Development Document for the Petroleum Refining Industry Existing Point Source Category*, EPA-440-1-76-083A. Page 92. U.S. Environmental Protection Agency, Office of Water and Hazardous Materials, Washington, DC. Publication available on NEPIS Website <www.epa.gov/nscep/> as document 440176083A.

[4] Boornazian, Linda and Mary Smith. 2006. *New Source Dates for Direct and Indirect Dischargers*. U.S. Environmental Protection Agency, Office of Water Memorandum. September 28, 2006. <www.epa.gov/npdes/pubs/newsource_dates.pdf>.

[5] U.S. Environmental Protection Agency. 1987. *Development Document for Effluent Limitations Guidelines and Standards for the Organic Chemicals, Plastics and Synthetic Fibers Point Source Category*. EPA 440-1-87-009. Page IX-9. <www.epa.gov/waterscience/guide/ocpsf/#guidance>.

[6] Jordan, J.W. 1984. *Calculations of Production-Based Effluent Limits*. U.S. Environmental Protection Agency, Office of Water, Washington, DC. Memorandum, December 18, 1984. <www.epa.gov/npdes/pubs/owm0427.pdf>.

[7] U.S. Environmental Protection Agency. 2001. *Permit Guidance Document: Transportation Equipment Cleaning Point Source Category (40 CFR 442)*, p. 30. EPA-821-R-01-021. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/guide/teci/tecguid.pdf>.

[8] U.S. Environmental Protection Agency. 2004. *Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432),* EPA-821-R-04-011. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/guide/mpp/final/tdd15.pdf>.

[9] Putnam, Hayes and Bartlett, Inc. 1982. *Protocol and Workbook for Determining Economic Achievability for National Pollutant Discharge Elimination System Permits*. U.S. Environmental Protection Agency, Permits Division, Washington, DC. <www.epa.gov/npdes/pubs/protocol_npdespermits.pdf.> and <www.epa.gov/npdes/pubs/workbook_econ_permits.pdf>

[10] U.S. Environmental Protection Agency. 1993. *Guidance Manual for Developing Best Management Practices (BMP)*. EPA 833-B-93-004. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0274.pdf>.

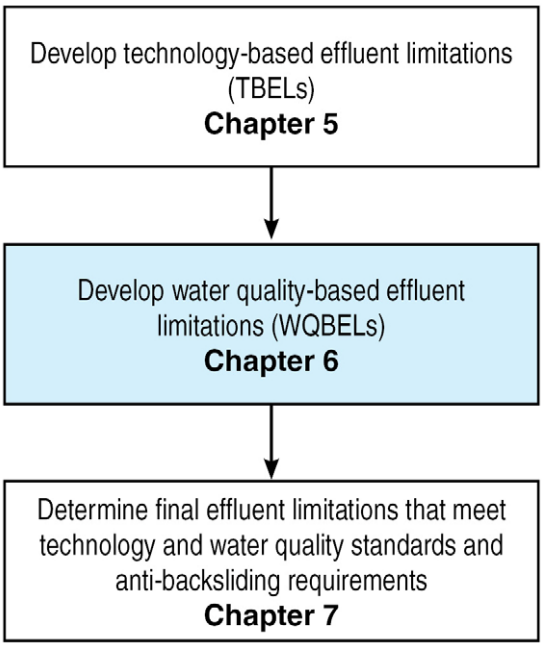
[11] U.S. Environmental Protection Agency. 1992. *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and BMPs*. EPA 832-R-92-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/contents_indguide.pdf>.

CHAPTER 6. Water Quality-Based Effluent Limitations

When drafting a National Pollutant Discharge Elimination System (NPDES) permit, a permit writer must consider the impact of the proposed discharge on the quality of the receiving water. Water quality goals for a waterbody are defined by state water quality standards. By analyzing the effect of a discharge on the receiving water, a permit writer could find that technology-based effluent limitations (TBELs) alone will not achieve the applicable water quality standards. In such cases, the Clean Water Act (CWA) and its implementing regulations require development of water quality-based effluent limitations (WQBELs). WQBELs help meet the CWA objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters and the goal of water quality that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water (*fishable/swimmable*).

WQBELs are designed to protect water quality by ensuring that water quality standards are met in the receiving water. On the basis of the requirements of Title 40 of the *Code of Federal Regulations* (CFR) 125.3(a), additional or more stringent effluent limitations and conditions, such as WQBELs, are imposed when TBELs are not sufficient to protect water quality. Exhibit 6-1 illustrates the relationship between TBELs and WQBELs in an NPDES permit, as well as the determination of final effluent limitations.

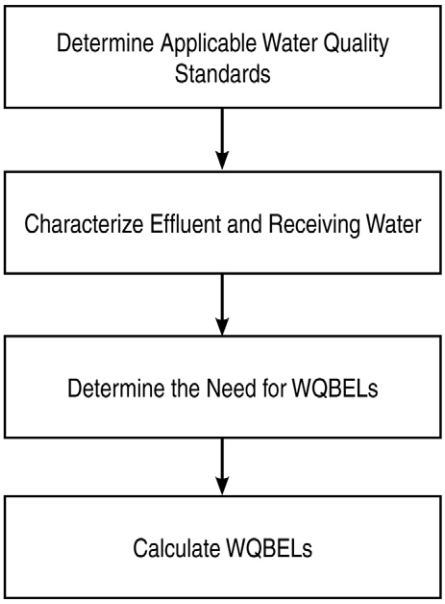
Exhibit 6-1 Developing effluent limitations



CWA section 301(b)(1)(C) requires that permits include any effluent limitations necessary to meet water quality standards. As illustrated above, to satisfy that requirement, permit writers implement a process to determine when existing effluent limitations (e.g., TBELs) and existing effluent quality are not sufficient to comply with water quality standards and to, where necessary, develop WQBELs. Exhibit 6-2 illustrates the four basic parts of the *standards-to-permits* process used to assess the need for and develop WQBELs.

After completing that process, the permit writer determines the final effluent limitations, includes any compliance schedules and interim effluent limitations, as appropriate, and documents all his or her decisions and calculations.

Exhibit 6-2 Standards-to-permits process



This chapter provides basic information on the standards-to-permits process. For more detailed information on water quality standards and water quality-based permitting, and some of the specific topics discussed in this chapter, refer to the NPDES Website <www.epa.gov/npdes> and Water Quality Standards Website <www.epa.gov/waterscience/standards>.

6.1 Determine Applicable Water Quality Standards

CWA section 303(c) and Part 131 establish the framework for water quality standards. The CWA and implementing regulations require states to develop and, from time to time, revise water quality standards applicable to waters of the United States, or segments of such waterbodies, that are in the jurisdiction of the state. States must review their water quality standards at least once every 3 years and revise them as appropriate. Wherever attainable, water quality standards should protect water quality that provides for the protection and propagation of fish, shellfish and wildlife, and recreation in and on the water (i.e., the CWA section 101(a)(2) *fishable/swimmable* goal). In establishing standards, states must consider the use and value of their waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation. The U.S. Environmental Protection Agency (EPA) has provided information regarding procedures for developing water quality standards in the Water Quality Standards Regulation at Part 131 and EPA's *Water Quality Standards Handbook: Second Edition*[1] <www.epa.gov/waterscience/library/wqstandards/handbook.pdf.> (hereafter *WQS Handbook*). Under CWA section 510, states may develop water quality standards that are more stringent than those required by the CWA.

EPA Regions review and approve or disapprove new and revised water quality standards adopted by states. The purpose of EPA's review is to ensure that the new and revised water quality standards meet the requirements of the CWA and the Water Quality Standards Regulation. Water quality standards adopted and submitted to EPA after May 30, 2000, must be approved by EPA before they may be used to implement the CWA (e.g., used in NPDES permitting). If an EPA Region disapproves a submitted new or revised state water quality standard, and the state does not adopt the necessary changes within 90 days of notification of the disapproval, EPA must promptly propose and promulgate a replacement standard [see § 131.22(a)].

When writing an NPDES permit, the permit writer must identify and use the state water quality standards in effect for CWA purposes. EPA maintains a compilation of current state water quality standards on the Water Quality Standards: State, Tribal, & Territorial Standards Website <www.epa.gov/waterscience/standards/wqslibrary/>. In addition, EPA's Water Quality Standards: Laws and Regulations Website <www.epa.gov/waterscience/standards/rules/> provides federally promulgated standards applicable to specific states. The remainder of this section provides permit writers with a general overview of water quality standards and how they are implemented in NPDES permits.

6.1.1 Components of Water Quality Standards

Water quality standards comprise three parts:

- Designated uses.
- Numeric and/or narrative water quality criteria.
- Antidegradation policy.

Each of those three components, along with general policies that also may be included in state water quality standards, is described below.

6.1.1.1 Designated Uses (§ 131.10)

The first part of a state's water quality standards is a classification system for waterbodies based on the expected uses of those waterbodies. The uses in this system are called *designated uses*. The regulations at § 131.10(a) describe various uses of waters that are considered desirable and that must be considered when establishing water quality standards. Those uses include public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. The regulations allow states to designate more specific uses (e.g., cold water aquatic life) [see § 131.10(c)] or uses not specifically mentioned in the CWA, with the exception of waste transport and assimilation, which are not acceptable designated uses [see § 131.10(a)]. States must also consider and ensure the attainment and maintenance of the water quality standards of downstream waters when establishing designated uses [see § 131.10(b)].

The regulations in § 131.10(j) effectively establish a *rebuttable presumption* that the uses in CWA section 101(a)(2) (fishable/swimmable) are attainable. If a state fails to designate a given waterbody for such uses, or wishes to remove such uses, it must provide appropriate documentation demonstrating why such uses are not attainable. This analysis is commonly called a *Use Attainability Analysis* (UAA) (see § 131.3(g) and section 6.1.2.1 below).

6.1.1.2 Water Quality Criteria (§ 131.11)

The second part of a state's water quality standards is the set of water quality criteria sufficient to support the designated uses of each waterbody. EPA's Water Quality Standards Regulation at § 131.11(a) requires states to adopt water quality criteria using sound scientific rationale and to include sufficient parameters or constituents to protect the designated use. If a waterbody has multiple use designations, the criteria must support the most sensitive use. The regulation at § 131.11(b) allows states to adopt both numeric and narrative water quality criteria. Numeric water quality criteria are developed for specific parameters to protect aquatic life and human health and, in some cases, wildlife from the deleterious effects of pollutants. States establish narrative criteria where numeric criteria cannot be established, or to supplement numeric criteria. Criteria newly adopted or revised on or after May 30, 2000, do not become effective for purposes of the CWA until approved by EPA [see § 131.21(c)].

CWA section 304(a) directs EPA to develop, publish, and, from time to time, revise criteria for water quality accurately reflecting the latest scientific knowledge on the following:

- The kind and extent of all identifiable effects on health and welfare, including effects on aquatic life and recreational uses, that may be expected from the presence of pollutants in any body of water.
- The concentration and dispersal of pollutants or their byproducts through biological, physical, and chemical processes.
- The effects of pollutants on biological community diversity, productivity, and stability.

EPA's recommended criteria developed under CWA section 304(a) assist states in developing their water quality standards. EPA's numeric criteria are ambient levels of individual pollutants or parameters or they describe conditions of a waterbody that, if met, generally will protect the CWA section 101(a)(2) fishable and swimmable uses. EPA's recommended criteria developed under CWA section 304(a) do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. EPA provides a table of the nationally recommended CWA section 304(a) criteria on the National Recommended Water Quality Criteria Website <www.epa.gov/waterscience/criteria/wqctable/>. The regulation at § 131.11(b)(1) indicates that, in establishing numeric criteria, states may (1) adopt EPA's recommended criteria published under CWA section 304(a), (2) adopt those criteria modified to reflect site-specific conditions, or (3) adopt criteria based on other scientifically defensible methods.

CWA section 303(c)(2)(B) specifically requires states to adopt numeric criteria for CWA section 307(a) toxic (priority) pollutants for which EPA has published recommended criteria if the discharge or presence of the pollutant can reasonably be expected to interfere with designated uses. Furthermore, § 131.11(a)(2) requires states to review water quality data and information on discharges to identify specific water bodies where toxic pollutants might be adversely affecting water quality or attainment of designated uses or where levels of toxic pollutants would warrant concern and to adopt criteria for such toxic pollutants applicable to the waterbody that are sufficient to protect the designated use. As discussed in section 1.2 and presented in Exhibit C-1 in Appendix C of this manual, the CWA section 307(a) list contains 65 compounds and families of compounds, which EPA has interpreted to include 126 toxic (priority) pollutants.

Numeric Criteria—Aquatic Life

Numeric criteria for the protection of aquatic life are designed to protect aquatic organisms, including both plants and animals. EPA's aquatic life criteria address both short-term (acute) and long-term (chronic) effects on both freshwater and saltwater species. Each of those criteria generally consists of three components:

- **Magnitude:** The level of pollutant (or pollutant parameter), usually expressed as a concentration, that is allowable.
- **Duration:** The period (averaging period) over which the in-stream concentration is averaged for comparison with criteria concentrations.
- **Frequency:** How often criteria may be exceeded.

Are criteria and effluent limitations expressed in the same terms?

Generally, criteria and effluent limitations are not expressed in the same terms. As discussed above, criteria are generally expressed as a magnitude, duration and frequency. Effluent limitations in NPDES permits are generally expressed as a magnitude (e.g., milligrams per liter, micrograms per liter) and an averaging period (e.g., maximum daily, average weekly, average monthly). A permit writer should be aware of the procedures used by his or her permitting authority to appropriately reflect the magnitude, duration, and frequency components of aquatic life criteria when determining the need for and calculating effluent limitations for NPDES permits. Typically, the components of the criteria are addressed in water quality models through the use of statistically derived receiving water and effluent flow values that ensure that criteria are met under *critical conditions* (see section 6.2 below).

Exhibit 6-3 is an example of freshwater aquatic life criteria for cadmium from the National Recommended Water Quality Criteria Website <www.epa.gov/waterscience/criteria/wqctable/> and at 66 FR 18935, April 12, 2001, Notice of Availability of 2001 Update: Aquatic Life Criteria Document for Cadmium <www.epa.gov/EPA-WATER/2001/April/Day-12/w9056.htm>.

Exhibit 6-3 Aquatic life criteria example: Cadmium (dissolved)

Except possibly where a locally important species is unusually sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably if

Chronic criterion:
The 4-day average concentration (in micrograms per liter [µg/L]) does not exceed the numerical value given by $e^{(0.7409[\ln(\text{hardness})]-4.719)}$ (1.101672 – [(ln hardness)(0.041838)]) more than once every 3 years on average.

Acute criterion:
The 24-hour average concentration (in µg/L) does not exceed the numerical value given by $e^{(1.0166[\ln(\text{hardness})]-3.924)}$ (1.136672 – [(ln hardness)(0.041838)]) more than once every 3 years on average.

It is apparent that the acute and chronic aquatic life criteria for cadmium are not simply single numbers. Rather, they are expressed as a magnitude, a duration (4-day average or 24-hour average), and a frequency (not more than once every 3 years). Furthermore, the magnitude is expressed by a formula that is hardness-dependent, as is the case for most criteria for metals.

The magnitude of other aquatic life criteria can vary according to other conditions in the water or even based on the presence or absence of certain aquatic life. For example, EPA's 1999 recommended ammonia criteria vary according to pH, temperature, the presence or absence of salmonid species, and the presence or absence of early life stages of fish. A permit writer must be aware of the applicable criteria and any state regulations, policies, and procedures for interpreting numeric criteria and for implementing the criteria in NPDES permits. The durations of aquatic life criteria vary as well. For example, EPA's criteria recommendations for ammonia include a 30-day average chronic criterion. Also, many acute criteria for toxic pollutants are expressed as a 1-hour average. The frequency component of most aquatic life criteria specifies that they should be exceeded no more than once every three years.

Some states have adopted numeric criteria for nutrients as part of their water quality standards. EPA has developed nutrient criteria recommendations that are numeric values for both causative (phosphorus and nitrogen) and response (chlorophyll *a* and turbidity) variables associated with the prevention and assessment of eutrophic conditions. EPA's recommended nutrient criteria are different from most of its other recommended criteria, such as the criteria for cadmium and ammonia. First, EPA's recommended nutrient criteria are *ecoregional* rather than nationally applicable criteria, and they can be refined and localized using nutrient criteria technical guidance manuals. Second, the recommended nutrient criteria represent conditions of surface waters that have minimal impacts caused by human activities rather than values derived from laboratory toxicity testing. Third, the recommended nutrient criteria are do not include specific duration or frequency components; however, the ecoregional nutrient criteria documents indicate that states may adopt seasonal or annual averaging periods for nutrient criteria instead of the 1-hour, 24-hour, or 4-day average durations typical of aquatic life criteria for toxic pollutants. The ecoregional nutrient criteria documents, technical guidance manuals, and other information on EPA's nutrient criteria recommendations, are available on the Water Quality Criteria for Nitrogen and Phosphorus Pollution Website <www.epa.gov/waterscience/criteria/nutrient/>.

Water quality standards also typically include aquatic life criteria for parameters such as temperature and pH that are not chemical constituents. Criteria for pH generally are expressed as an acceptable pH range in the waterbody. Temperature criteria might be expressed as both *absolute temperature values* (e.g., temperature may not exceed 18 degrees Celsius [°C]) and restrictions on causing *changes in temperature* in the waterbody (e.g., discharges may not warm receiving waters by more than 0.5 °C).

In addition to criteria for individual pollutants or pollutant parameters, many states include in their water quality standards criteria for dissolved oxygen. Often, criteria for dissolved oxygen are addressed by modeling and limiting discharges of oxygen-demanding pollutants such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), and nutrients (phosphorus and nitrogen).

Finally, states could also include in their water quality standards numeric criteria to address the effect of mixtures of pollutants. For example, whole effluent toxicity (WET) criteria protect the waterbody from the aggregate and synergistic toxic effects of a mixture of pollutants. WET is discussed in detail later in this chapter.

Numeric Criteria—Human Health

Human health criteria for toxic pollutants are designed to protect people from exposure resulting from consumption of fish or other aquatic organisms (e.g., mussels, crayfish) or from consumption of both water and aquatic organisms. These criteria express the highest concentrations of a pollutant that are not

expected to pose significant long-term risk to human health. Exhibit 6-4 is an example of human health criteria for dichlorobromomethane.

Exhibit 6-4 Human health criteria example: Dichlorobromomethane

For the protection of human health from the potential carcinogenic effects of dichlorobromomethane through ingestion of water and contaminated aquatic organisms, the ambient water criterion is determined to be 0.55 µg/L.
For the protection of human health from the potential carcinogenic effects of dichlorobromomethane through ingestion contaminated aquatic organisms alone, the ambient water criterion is determined to be 17 µg/L.
These values were calculated based on a national default freshwater/estuarine fish consumption rate of 17.5 grams per day.

Other criteria for protection of human health (e.g., bacteria criteria) consider a shorter-term exposure through uses of the waterbody such as contact recreation. EPA's current bacteria criteria recommendations use enterococci and *Escherichia coli* bacteria as indicators and include two components: a geometric mean value and a single sample maximum value. EPA has developed information on implementing those criteria in water quality standards on the Microbial (Pathogen) Water Quality Criteria Website <www.epa.gov/waterscience/criteria/humanhealth/microbial/>.

Other Numeric Criteria

In addition to aquatic life and human health criteria, some state water quality standards include other forms of numeric criteria, such as wildlife, sediment, and biocriteria.

Wildlife criteria are derived to establish ambient concentrations of chemicals that, if not exceeded, will protect mammals and birds from adverse impacts resulting from exposure to those chemicals through consumption of aquatic organisms and water. EPA established four numeric criteria to protect wildlife in the Great Lakes system in its *Final Water Quality Guidance for the Great Lakes System* <www.epa.gov/EPA-WATER/1995/March/Day-23/pr-82.html> (60 FR 15387, March 23, 1995).

In a healthy aquatic community, sediments provide a habitat for many living organisms. Controlling the concentration of pollutants in the sediment helps to protect bottom-dwelling species and prevents harmful toxins from moving up the food chain and accumulating in the tissue of animals at progressively higher levels. For more information on this topic, see EPA's Suspended and Bedded Sediments Website <www.epa.gov/waterscience/criteria/sediment/>.

The presence, condition and numbers of types of fish, insects, algae, plants, and other organisms are data that, together, provide direct, accurate information about the health of specific bodies of water. Biological criteria (biocriteria) are narrative or numeric expressions that describe the reference biological integrity (structure and function) of aquatic communities inhabiting waters of a given designated aquatic life use. Biocriteria are based on the numbers and kinds of organisms present and are regulatory-based biological measurements. They are used as a way of describing the qualities that must be present to support a desired condition in a waterbody, and they serve as the standard against which biological assessment results are compared. EPA's Biocriteria: Uses of Data in NPDES Permits Website <www.epa.gov/waterscience/biocriteria/watershed/npdes.html> provides more information on the use of bioassessment information.

Narrative Criteria

All states have adopted narrative water quality criteria to supplement numeric criteria. Narrative criteria are statements that describe the desired water quality goal for a waterbody. Narrative criteria, for example, might require that discharges be "free from toxics in toxic amounts" or be "free of objectionable color, odor, taste, and turbidity." Narrative criteria can be the basis for limiting specific pollutants for which the state does not have numeric criteria [§ 122.44(d)(1)(vi)] or they can be used as the basis for limiting toxicity using WET requirements where the toxicity has not yet been traced to a specific pollutant or pollutants [§ 122.44(d)(1)(v)]. For toxic pollutants, EPA's Water Quality Standards Regulation at § 131.11(a)(2) requires states to develop implementation procedures for toxics narrative criteria that address how the state intends to regulate point source discharges of toxic pollutants to water quality limited segments.

6.1.1.3 Antidegradation Policy (§ 131.12)

The third part of a state's water quality standards is its antidegradation policy. Each state is required to adopt an antidegradation policy consistent with EPA's antidegradation regulations at § 131.12. A state's antidegradation policy specifies the framework to be used in making decisions about proposed activities that will result in changes in water quality. Antidegradation policies can play a critical role in helping states protect the public resource of water whose quality is better than established criteria levels and ensure that decisions to allow reductions in water quality are made in a public manner and serve the public good. Along with developing an antidegradation policy, each state must identify the method it will use to implement the policy. It is important for permit writers to be familiar with their state's antidegradation policy and how that policy is to be implemented in NPDES permits.

A state's antidegradation policy provides three levels of protection from degradation of existing water quality:

- **Tier 1:** This tier requires that existing uses, and the level of water quality necessary to protect the existing uses, be maintained and protected.
- **Tier 2:** Where the quality of waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water (sometimes referred to as *high-quality waters*), Tier 2 requires that this level of water quality be maintained and protected unless the state finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the state's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area where the waters are located. In allowing any such degradation or lower water quality, the state must assure water quality adequate to protect existing uses fully and must assure that there will be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.
- **Tier 3:** This tier requires that the water quality of *outstanding national resources waters* (ONRWs) be maintained and protected.

States take a variety of approaches to implementing antidegradation policies. Some states designate their waters as Tier 1, Tier 2 (high-quality water) or Tier 3 waters in their antidegradation implementation methods, while others designate a waterbody as a Tier 2 or high-quality water only when activities that would degrade water quality are proposed. In some cases, states may have classified the waterbody as

receiving a tier of protection for all pollutant-related parameters, whereas in other cases, tiers of protection have been determined on a parameter-by-parameter basis.

6.1.1.4 General Policies (§ 131.13)

In addition to the three required components of water quality standards, states may, at their discretion, include in their standards policies that generally affect how the standards are applied or implemented. Examples of such policies include mixing zone policies, critical low flows at which criteria must be achieved, and the availability of variances. Some general policies are discussed in more detail later in this chapter. As with the other components of water quality standards, general policies are subject to EPA review and approval if they are deemed to be new or revised water quality standards (i.e., if they constitute a change to designated use(s), water quality criteria, antidegradation requirements, or any combination).

Additional and more detailed information on water quality standards is available in the WQS Handbook.

6.1.2 Water Quality Standards Modifications

Permit writers should be aware of several types of modifications to water quality standards that could permanently or temporarily change the standards and, thus, change the fundamental basis of WQBELs. Those modifications, described below, are as follows:

- Designated use reclassification.
- Site-specific water quality criteria modification.
- Water quality standard variance.

6.1.2.1 Designated Use Reclassification

Once a use has been designated for a particular waterbody or segment, that use may not be removed from the water quality standards except under specific conditions. To remove a designated use, the state demonstrates that attaining that use is not feasible because of any one of the six factors listed in § 131.10(g). The regulations at § 131.10(j) specifically require a state to conduct a UAA if the designated uses for a waterbody do not include the uses in CWA section 101(a)(2) (i.e., fishable/swimmable uses); if the state wishes to remove designated uses included in CWA section 101(a)(2) from its water quality standards; or if the state wishes to adopt subcategories of CWA section 101(a)(2) uses with less stringent criteria. The WQS Handbook discusses UAAs and removing designated uses in detail. Reclassifying a waterbody's designated uses, as supported by a UAA, is a permanent change to both the designated use(s) and the water quality criteria associated with that (those) use(s).

States may conduct a UAA and remove a designated use but not if it is an existing use. Existing uses are defined in § 131.3 as those uses actually attained in the waterbody on or after November 28, 1975 (the date of EPA's initial water quality standards regulation at 40 *Federal Register* 55334, November 28, 1975). At a minimum, uses are deemed attainable if they can be achieved by the implementing effluent limits required under CWA sections 301(b) and 306 and by implementing cost effective and reasonable best management practices (BMPs) for nonpoint source control. EPA's Water Quality Standards: UAA Website <www.epa.gov/waterscience/standards/uses/uaa/index.htm> provides additional information and some example UAAs.

6.1.2.2 Site-Specific Water Quality Criteria Modification

As noted above, CWA sections 303(a)–(c) require states to adopt water quality criteria sufficient to protect applicable designated uses. In some cases, a state might find that the criteria it has adopted to protect a waterbody or segment of a waterbody do not adequately account for site-specific conditions. In such cases, states have the option of modifying water quality criteria on a site-specific basis. Setting site-specific criteria might be appropriate where, for example, a state has adopted EPA's CWA section 304(a) criteria recommendations and finds that physical or chemical properties of the water at a site affect the bioavailability or toxicity of a chemical, or the types of local aquatic organisms differ significantly from those actually tested in developing the EPA-recommended criteria. Site-specific criteria modifications change water quality criteria permanently while continuing to support the current designated uses.

Development of site-specific criteria for aquatic life is discussed in section 3.7 of the WQS Handbook for cases when (1) there might be relevant differences in the toxicity of the chemical in the water at the site and laboratory dilution water (Water-Effect Ratio Procedure) and (2). the species at the site are more or less sensitive than those used in developing the natural criteria (Species Recalculation Procedure). EPA's Office of Science and Technology (OST) has developed the Interim Guidance on Determination and Use of Water-Effect Ratios for Metals <www.epa.gov/waterscience/standards/handbook/handbookappxL.pdf> in Appendix L of the WQS Handbook and the *Streamlined Water-Effect Ratio Procedure for Discharges of Copper*[2] <www.epa.gov/waterscience/criteria/copper/copper.pdf>. In addition, pages 90-97 of Appendix L provide guidance for using the Species Recalculation Procedure. States may also consider establishing aquatic life criteria based on *natural background* conditions. Further information can be found in the memo *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background*[3] <www.epa.gov/waterscience/library/wqcriteria/naturalback.pdf>.

6.1.2.3 Water Quality Standard Variance

Water quality standard variances are changes to water quality standards and have similar substantive and procedural requirements as what are required to remove a designated use. Unlike use removal, variances are time-limited and do not permanently remove the current designated use of a waterbody. Variances are usually discharger- and pollutant-specific, though some states have adopted *general variances*. Where a state has adopted a general variance, the analyses necessary for the variance have been completed on a watershed-wide or statewide basis and, therefore, the process of obtaining a variance is simplified for individual dischargers in that watershed or state.

A variance might be appropriate where the state believes that the existing standards are ultimately attainable and that, by retaining the existing standards rather than changing them, the state would ensure that further progress is made in improving the water quality toward attaining the designated uses while the variance is in effect. State-adopted variances have been approved by EPA where, among other things, the state's standards allow variances and the state demonstrates that meeting the applicable criteria is not feasible on the basis of one or more of the factors outlined in § 131.10(g). A variance typically is granted for a specified period and must be reevaluated at least once every 3 years as reasonable progress is made toward meeting the standards [see section 5.3 of the WQS Handbook and § 131.20(a)].

Modifications of water quality standards could affect effluent limitations in permits in several ways. Specifically, the modifications can change the fundamental basis for WQBELs, potentially affecting an assessment of the need for WQBELs and possibly resulting in either more or less stringent WQBELs than

would otherwise be required. It is the permit writer's responsibility to ensure that any EPA-approved modification of water quality standards is properly reflected in an affected NPDES permit.

6.1.3 Water Quality Standards Implementation

As previously noted, CWA section 301(b)(1)(C) requires NPDES permits to establish effluent limitations as necessary to meet water quality standards. Effluent limitations and other conditions in NPDES permits may be based on a parameter-specific approach or a WET testing approach to implementing water quality standards. A third approach to implementing water quality standards, using biocriteria or bioassessment, is not directly accomplished through NPDES permit effluent limitations but can lead to effluent limitations for specific parameters or for WET. Each of those approaches to implementing water quality standards is discussed briefly below.

What procedures should permit writers use to implement water quality standards?

The terminology used and procedures described in this manual when discussing both assessing the need for and calculating WQBELs are based on the procedures in EPA's *Technical Support Document for Water Quality-Based Toxics Control*[4] <www.epa.gov/npdes/pubs/owm0264.pdf> (hereafter *TSD*). Those procedures were developed specifically to address toxic pollutants but have been appropriately used to address a number of conventional and nonconventional pollutants as well. Permit writers should be aware that most permitting authorities have developed their own terminology and procedures for water quality-based permitting, often derived from, but with variations on, EPA's guidance. For example, EPA itself promulgated *Final Water Quality Guidance for the Great Lakes System* (60 FR 15387, March 23, 1995) with minimum water quality criteria, antidegradation policies, and implementation procedures, including permitting procedures based on the TSD. Under the CWA, Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin were required to adopt procedures for the Great Lakes system that are consistent with that guidance. Permit writers should always consult the applicable permitting regulations, policy, and guidance for the approved water quality-based permitting procedures in their state.

6.1.3.1 Parameter-Specific Approach

The parameter-specific approach uses parameter-specific criteria for protection of aquatic life, human health, wildlife, and sediments, as well as any other parameter-specific criteria adopted into a state's water quality standards. The criteria are the basis for analyzing an effluent, deciding which parameters need controls, and deriving effluent limitations that will control those parameters to the extent necessary to achieve water quality standards in the receiving water. Parameter-specific WQBELs in NPDES permits involve a site-specific evaluation of the discharge (or proposed discharge) and its potential effect on the receiving water or an evaluation of the effects of multiple sources of a pollutant on the receiving water (e.g., through a total maximum daily load [TMDL] analysis). The parameter-specific approach allows for controlling individual parameters, (e.g., copper, BOD, total phosphorus) before a water quality impact has occurred or for helping return water quality to a level that will meet designated uses.

6.1.3.2 Whole Effluent Toxicity (WET) Approach

WET requirements in NPDES permits protect aquatic life from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach is useful for complex effluents where it might be infeasible to identify

and regulate all toxic pollutants in the effluent or where parameter-specific effluent limitations are set, but the combined effects of multiple pollutants are suspected to be problematic. The WET approach allows a permit writer to implement numeric criteria for toxicity included in a state's water quality standards or to be protective of a narrative "no toxics in toxic amounts" criterion. Like the parameter-specific approach, the WET approach allows permitting authorities to control toxicity in effluents before toxic impacts occur or may be used to help return water quality to a level that will meet designated uses.

6.1.3.3 Bioassessment Approach

The biocriteria approach is used to assess the overall biological integrity of an aquatic community. As discussed in section 6.1.1.2 above, biocriteria are numeric values or narrative statements that describe the biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use. When incorporated into state water quality standards, biocriteria and aquatic life use designations serve as direct endpoints for determining aquatic life use attainment. Once biocriteria are developed, the biological condition of a waterbody can be measured through a biological assessment, or bioassessment.

A bioassessment is an evaluation of the biological condition of a waterbody using biological surveys and other direct measurements of resident biota in surface waters. A biological survey, or biosurvey, consists of collecting, processing, and analyzing representative portions of a resident aquatic community to determine the community structure and function. The results of biosurveys can be compared to the reference waterbody to determine if the biocriteria for the designated use of the waterbody are being met. EPA issued guidance on this approach in *Biological Criteria: National Program Guidance for Surface Waters*[5] <www.epa.gov/bioindicators/html/biolcont.html>. As previously discussed, biocriteria generally are not directly implemented through NPDES permits but could be used in assessing whether a waterbody is attaining water quality standards. Nonattainment of biocriteria could lead to parameter-specific effluent limitations where the permitting authority is able to identify specific pollutant(s) and source(s) contributing to that nonattainment (see EPA's Biocriteria: Uses of Data – Identify Stressors to a Waterbody Website <www.epa.gov/waterscience/biocriteria/uses/stressors.html>) or could lead to WET limitations where the permitting authority identifies sources of toxicity to aquatic life. EPA's Biocriteria: Uses of Data - NPDES <www.epa.gov/waterscience/biocriteria/watershed/npdes.html> provides examples on the use of bioassessment information in the NPDES permitting process.

Sections 6.2–6.4 below discuss, in detail, implementing water quality standards using the parameter-specific approach to assess the need for and develop effluent limitations in NPDES permits. Section 6.5 below provides additional detail on WET requirements in NPDES permits.

6.2 Characterize the Effluent and the Receiving Water

After identifying the most current, approved, water quality standards that apply to a waterbody, a permit writer should characterize both the effluent discharged by the facility being permitted and the receiving water for that discharge. The permit writer uses the information from those characterizations to determine whether WQBELs are required (section 6.3 below) and, if so, to calculate WQBELs (section 6.4 below). Characterizing the effluent and receiving water can be divided into five steps as shown in Exhibit 6-5 and discussed in detail below.

Exhibit 6-5 Steps for characterizing the effluent and receiving water

Step 1.	Identify pollutants of concern in the effluent
Step 2.	Determine whether water quality standards provide for consideration of a dilution allowance or mixing zone
Step 3.	Select an approach to model effluent and receiving water interactions
Step 4.	Identify effluent and receiving water critical conditions
Step 5.	Establish an appropriate dilution allowance or mixing zone

6.2.1 Step 1: Identify Pollutants of Concern in the Effluent

There are several sources of information for and methods of identifying pollutants of concern for WQBEL development. For some pollutants of concern, the permit writer might not need to conduct any further analysis and could, after characterizing the effluent and receiving water, proceed directly to developing WQBELs (section 6.4 below). For other pollutants of concern, the permit writer uses the information from the effluent and receiving water characterization to assess the need for WQBELs (section 6.3 below). The following subsections identify five categories of pollutants of concern for WQBEL development.

6.2.1.1 Pollutants with Applicable TBELs

One category of pollutants of concern includes those pollutants for which the permit writer has developed TBELs based on national or state technology standards or on a case-by-case basis using best professional judgment. By developing TBELs for a pollutant, the permit writer has already determined that there will be some type of final limitations for that pollutant in the permit and must then determine whether more stringent limitations than the applicable TBELs are needed to prevent an excursion above water quality standards in the receiving water (see Exhibit 6-1 above). A permit writer can determine whether the TBELs are sufficiently protective by either proceeding to calculate WQBELs as described in section 6.4 below and comparing them to the TBELs or by assuming that the maximum daily TBEL calculated is the maximum discharge concentration in the water quality assessments described in section 6.3 below.

6.2.1.2 Pollutants with a Wasteload Allocation from a TMDL

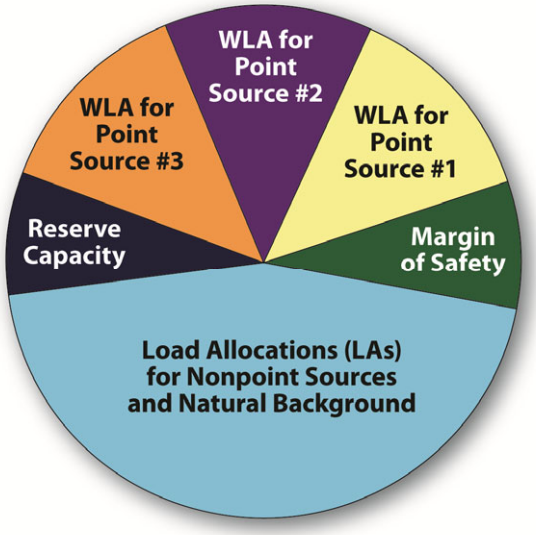
Pollutants of concern include those pollutants for which a *wasteload allocation* (WLA) has been assigned to the discharge through a TMDL. Under CWA section 303(d), states are required to develop lists of impaired waters. Impaired waters are those that do not meet the water quality standards set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that those jurisdictions establish priority rankings for waters on their CWA section 303(d) list and develop TMDLs for those waters.

What is a WLA?

The term WLA refers to the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution [see § 130.2(h)]. The WLA could be allocated through an EPA-approved TMDL, an EPA or state watershed loading analysis, or a facility-specific water quality modeling analysis.

A TMDL is a calculation of the maximum amount of a single pollutant that a waterbody can receive and still meet water quality standards and an allocation of that amount to the pollutant's sources. The portions of the TMDL assigned to point sources are WLAs, and the portions assigned to nonpoint sources and background concentrations of the pollutant are called *load allocations* (LAs). The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes designated in the water quality standards, to provide for the uncertainty in predicting how well pollutant reduction will result in meeting water quality standards, and to account for seasonal variations. A TMDL might also include a reserve capacity to accommodate expanded or new discharges in the future. Exhibit 6-6 depicts the parts of a TMDL.

Exhibit 6-6 Parts of a TMDL



TMDL = ΣWLA + ΣLA + Margin of Safety + Reserve Capacity

The NPDES regulations at § 122.44(d)(1)(vii)(B) require that NPDES permits include effluent limitations developed consistent with the assumptions and requirements of any WLA that has been assigned to the discharge as part of an approved TMDL. Thus, any pollutant for which a WLA has been assigned to the permitted facility through a TMDL is a pollutant of concern.

Permit writers might also choose to consider any pollutant associated with an impairment of the receiving water a pollutant of concern, regardless of whether an approved TMDL has been developed for that pollutant, a WLA has been assigned to the permitted facility, or the permitted facility has demonstrated that the pollutant is present in its effluent. Permitting authorities might consider monitoring requirements to collect additional data related to the presence or absence of the impairing pollutant in a specific discharge to provide information for further analyses.

6.2.1.3 Pollutants Identified as Needing WQBELs in the Previous Permit

Another category of pollutants of concern includes those pollutants that were identified as needing WQBELs in the discharger's previous permit. Permit writers must determine whether the conditions leading to a decision to include WQBELs for the pollutant in the previous permit continue to apply. Where those conditions no longer apply, the permit writer would need to complete an anti-backsliding

analysis to determine whether to remove the WQBELs from the reissued permit. Chapter 7 of this manual provides additional information on anti-backsliding requirements of the CWA and NPDES regulations. In addition, the permit writer might need to conduct an antidegradation analysis if the revised limitation would allow degradation of the quality of the receiving water.

6.2.1.4 Pollutants Identified as Present in the Effluent through Monitoring

Pollutants of concern also include any pollutants identified as present in the effluent through effluent monitoring. Effluent monitoring data are reported in the discharger's NPDES permit application, discharge monitoring reports and special studies. In addition, the permitting authority might collect data itself through compliance inspection monitoring or other special study. Permit writers can match information on which pollutants are present in the effluent to the applicable water quality standards to identify parameters that are candidates for WQBELs.

6.2.1.5 Pollutants Otherwise Expected to be Present in the Discharge

A final category of pollutants of concern includes those pollutants that are not in one of the other categories but are otherwise expected to be present in the discharge. There might be pollutants for which neither the discharger nor the permitting authority have monitoring data but, because of the raw materials stored or used, products or by-products of the facility operation, or available data and information on similar facilities, the permit writer has a strong basis for expecting that the pollutant could be present in the discharge. Because there are no analytical data to verify the concentrations of these pollutants in the effluent, the permit writer must either postpone a quantitative analysis of the need for WQBELs and generate, or require the discharger to generate, effluent monitoring data, or base a determination of the need for WQBELs on other information, such as the effluent characteristics of a similar discharge. A discussion on determining the need for WQBELs without effluent monitoring data is provided in section 6.3.3 below.

6.2.2 Step 2: Determine Whether Water Quality Standards Provide for Consideration of a Dilution Allowance or Mixing Zone

Many state water quality standards have general provisions allowing some consideration of mixing of effluent and receiving water when determining the need for and calculating WQBELs. Depending on the state's water quality standards and implementation policy, such a mixing consideration could be expressed in the form of a *dilution allowance* or *regulatory mixing zone*. A dilution allowance typically is expressed as the flow of a river or stream, or a portion thereof. A regulatory mixing zone generally is expressed as a limited area or volume of water in any type of waterbody where initial dilution of a discharge takes place and within which the water quality standards allow certain water quality criteria to be exceeded. Section 6.2.5 below discusses dilution allowances and mixing zones in greater detail.

State water quality standards or implementation policies might indicate specific locations or conditions (e.g., breeding grounds for aquatic species or bathing beaches) or water quality criteria (e.g., pathogens, pH, bioaccumulative pollutants, or narrative criteria) for which consideration of a dilution allowance or mixing zone is not allowed or is otherwise considered inappropriate.

6.2.3 Step 3: Select an Approach to Model Effluent and Receiving Water Interactions

Where consideration of a dilution allowance or mixing zone is not permitted by the water quality standards or is not appropriate, the relevant water quality criterion must be attained at the point of discharge. In such cases, there is no need for a water quality model to characterize the interaction between the effluent and receiving water. In this situation effluent limitations are based on attaining water quality criteria at the "end of the pipe."

Where a dilution allowance or mixing zone is permitted, however, characterizing the interaction between the effluent and receiving water generally requires using a water quality model. In the majority of situations, and in all of the examples provided in this manual, permit writers will use a steady-state water quality model to assess the impact of a discharge on its receiving water. Steady-state means that the model projects the impact of the effluent on the receiving water under a single or *steady* set of design conditions. Because the model is run under a single set of conditions, those conditions generally are set at *critical conditions* for protection of receiving water quality as discussed in section 6.2.4 below. The permit writer would determine the amount of the dilution allowance or the size of the mixing zone that is available under these critical conditions as provided in section 6.2.5 below.

6.2.4 Step 4: Identify Effluent and Receiving Water Critical Conditions

Where steady-state models are used for water quality-based permitting, an important part of characterizing the effluent and receiving water is identifying the critical conditions needed as inputs to the water quality model. Permit writers should discuss selection of critical conditions with water quality modelers or other water quality specialists. Identifying the right critical conditions is important for appropriately applying a water quality model to assess the need for WQBELs and to calculate WQBELs. Some key effluent and receiving water critical conditions are summarized below.

What if I am not a water quality modeler?

Permit writers are not always water quality modelers, nor do they necessarily need to be experts in this field. Many permitting authorities have a team of water quality specialists who model point source discharges to provide data required for permit writers to assess the need for and develop WQBELs. In some cases, this team might even calculate WQBELs directly for the permit writers, who then only need to compare them to TBELs and determine the final effluent limitations for the NPDES permit. Permit writers should, at a minimum, familiarize themselves with water quality modeling concepts presented in this manual, particularly the identification of critical conditions input to a steady-state water quality model, and should consult water quality modelers or other water quality specialists as needed in the process of NPDES permit development.

6.2.4.1 Effluent Critical Conditions

In most any steady-state water quality model there will be at least two basic critical conditions related to the effluent: flow and pollutant concentration.

Effluent Flow

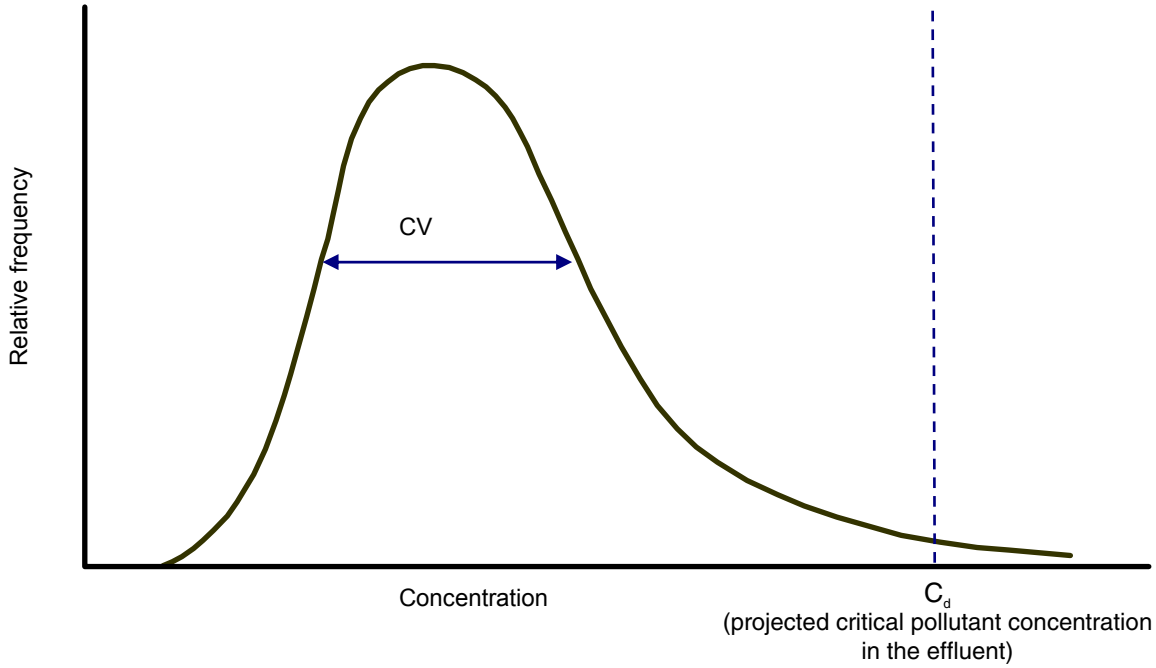
Effluent flow (designated Q_d in the water quality modeling equations used in this manual) is a critical design condition used when modeling the impact of an effluent discharge on its receiving water. A permit writer should be able to obtain effluent flow data from discharge monitoring reports or a permit application. Permitting authority policy or procedures might specify which flow measurement to use as the critical effluent flow value(s) in various water quality-based permitting calculations (e.g., the maximum daily flow reported on the permit application, the maximum of the monthly average flows from discharge monitoring reports for the past three years, the facility design flow). Permit writers should follow existing policy or procedures for determining critical effluent flow or, if the permitting authority does not specify how to determine this value, look at past permitting practices and strive for consistency.

Effluent Pollutant Concentration

Permit writers can determine the critical effluent concentration of the pollutant of concern (designated C_d) by gathering effluent data representative of the discharge. To establish the critical effluent pollutant concentration from the available data, EPA has recommended considering a concentration that represents something close to the maximum concentration of the pollutant that would be expected over time. In most cases, permit writers have a limited effluent data set and, therefore, would not have a high degree of certainty that the limited data would actually include the maximum potential effluent concentration of the pollutant of concern. In addition, the NPDES regulations at § 122.44(d)(1)(ii) require that permit writers consider the variability of the pollutant in the effluent when determining the need for WQBELs. To address those concerns, EPA developed guidance for permit writers on how to characterize effluent concentrations of certain types of pollutants using a limited data set and accounting for variability. This guidance is detailed in EPA's TSD.

By studying effluent data for numerous facilities, EPA determined that daily pollutant measurements of many pollutants follow a *lognormal distribution*. The TSD procedures allow permit writers to project a critical effluent concentration (e.g., the 99th or 95th percentile of a lognormal distribution of effluent concentrations) from a limited data set using statistical procedures based on the characteristics of the lognormal distribution. These procedures use the number of available effluent data points for the measured concentration of the pollutant and the coefficient of variation (or CV) of the data set, which is a measure of the variability of data around the average, to predict the critical pollutant concentration in the effluent. Exhibit 6-7 provides an example of a lognormal distribution of effluent pollutant concentrations and projection of a critical effluent pollutant concentration (C_d). For additional details regarding EPA's guidance, see Chapter 3 of the TSD. Many permitting authorities have developed procedures for estimating a critical effluent pollutant concentration that are based on or derived from those procedures. For pollutants with effluent concentrations that *do not* follow a lognormal distribution, permit writers would rely on alternative procedures developed by their permitting authority for determining the critical effluent pollutant concentration.

Exhibit 6-7 Example of lognormal distribution of effluent pollutant concentrations and projection of critical concentration (C_d)



6.2.4.2 Receiving Water Critical Conditions

As with the effluent, flow (for rivers and streams) and pollutant concentration are receiving water critical conditions used in steady-state water quality models. In addition, depending on the waterbody and pollutant of concern, there could be additional receiving water characteristics that permit writers need to consider in a water quality model.

Receiving Water Upstream Flow

For rivers and streams, an important critical condition is the stream flow upstream of the discharge (designated Q_s). That critical condition generally is specified in the applicable water quality standards and reflects the duration and frequency components of the water quality criterion that is being addressed. For most pollutants and criteria, the critical flow in rivers and streams is some measure of the low flow of that river or stream; however, the critical condition could be different (for example, a high flow, where wet weather sources are a major problem). If a discharge is controlled so that it does not cause water quality criteria to be exceeded in the receiving water at the critical flow condition, the discharge controls should be protective and ensure that water quality criteria, and thus designated uses, are attained under all receiving water flow conditions.

Examples of typical critical hydrologically based low flows found in water quality standards include the 7Q10 (7-day average, once in 10 years) low flow for chronic aquatic life criteria, the 1Q10 low flow for acute aquatic life criteria, and the harmonic mean flow for human health criteria for toxic organic pollutants. The permit writer might examine stream flow data from the state or the U.S. Geological

Survey to determine the critical flow at a point upstream of the discharge. The permit writer might also account for any additional sources of flow or diversions between the point where a critical low flow has been calculated and the point of discharge. EPA also has developed a biologically based flow method that directly uses the durations and frequencies specified in the water quality criteria.

Climate Change Considerations

As noted in this section, the receiving water upstream flow is an important factor in modeling the interaction between the effluent discharge and a river or stream. In most instances, state water quality standards or implementation policies establish the critical low flows that should be used in modeling this interaction. The most common source of upstream flow data for water quality modelers is historical flow gage data available through the U.S. Geological Survey. Modelers should be aware that the effects of climate change could alter historical flow patterns in rivers and streams, making these historical flow records less accurate in predicting current and future critical flows. Where appropriate, water quality modelers should consider alternate approaches to establishing critical low flow conditions that account for these climatic changes.

Receiving Water Background Pollutant Concentration

In addition to determining the critical effluent concentration of the pollutant of concern, the permit writer also should determine the critical background concentration of the pollutant of concern in the receiving water before the discharge (designated C_s) to ensure that any pollutant limitations derived are protective of the designated uses. Permitting authority policies or procedures often address how to determine that critical background concentration value for the pollutant. For example, using ambient data or working with the discharger to obtain reliable ambient data, the permit writer might use the maximum measured background pollutant concentration or, perhaps, an average of measured concentrations as the critical condition. Ambient data will provide the most reliable characterization of receiving water background pollutant concentration. EPA encourages permitting authorities to collect and use actual ambient data, where possible. Where data are not available, however, the state might have other procedures, such as establishing that without valid and representative ambient data, no dilution or mixing will be allowed (i.e., criteria end-of-pipe), or using a percentage of an applicable water quality criterion or a detection, quantitation, or other reporting level. The permit writer should consult the permitting authority's policies and procedures or, if there are no policies or procedures available, look at past permitting practices and maintain consistency with those practices when determining the critical receiving water background concentrations.

Other Receiving Water Characteristics

For waterbodies other than free-flowing rivers and streams, there might be critical environmental conditions that apply rather than flow (e.g., tidal flux, temperature). In addition, depending on the pollutant of concern, the effects of biological activity and reaction chemistry might be important in assessing the impact of a discharge on the receiving water. In such situations, additional critical receiving water conditions that might be used in a steady-state water quality model include conditions such as pH, temperature, hardness, or reaction rates, and the presence or absence of certain fish species or life stages of aquatic organisms, to name a few.

Sections 6.3 and 6.4 below provide further discussion of how critical conditions are applied in a water quality model to determine the need for and calculate WQBELs.

6.2.5 Step 5: Establish an Appropriate Dilution Allowance or Mixing Zone

Following verification of whether the applicable water quality standards allow any consideration of effluent and receiving water mixing and, for a steady-state modeling approach, the critical conditions that apply to the effluent and receiving water, permit writers can determine how the effluent and the receiving water mix under critical conditions. Based on this determination, permit writers can then establish the maximum dilution allowance or mixing zone allowed by the water quality standards for each pollutant of concern.

6.2.5.1 Type of Mixing Under Critical Conditions

On the basis of requirements in the water quality standards, the dilution allowance or mixing zone used in water quality models and calculations are likely to vary depending on whether there is rapid and complete mixing or incomplete mixing of the effluent and receiving water under critical conditions. Thus, the permit writer needs to understand something about *how* the effluent and receiving water mix under critical conditions.

Rapid and complete mixing is mixing that occurs when the lateral variation in the concentration of a pollutant in the direct vicinity of the outfall is small. The applicable water quality standards might specify certain conditions under which a permit writer could *assume* that rapid and complete mixing is occurring, such as the presence of a diffuser. Some standards may also allow a *demonstration* of rapid and complete mixing in cases where the conditions for simply assuming rapid and complete mixing are not met. For example, the applicable water quality standards might specify a distance downstream of a discharge point by which the pollutant concentration across the stream width must vary by less than a certain percentage to assume that there is rapid and complete mixing.

If the permit writer cannot assume rapid and complete mixing and there has been no demonstration of rapid and complete mixing, the permit writer should assume that there is incomplete mixing. Under incomplete mix conditions, mixing occurs more slowly and higher concentrations of pollutants are present in-stream near the discharge as compared to rapid and complete mixing. Thus, an assumption of incomplete mixing is more conservative than an assumption of rapid and complete mixing. For waterbodies other than rivers and streams (e.g., lakes, bays, and the open ocean) the permit writer usually would assume incomplete mixing.

6.2.5.2 Maximum Dilution Allowance or Mixing Zone Size

Once a permit writer determines whether the applicable water quality standards allow consideration of some ambient dilution or mixing and determines the type of mixing taking place (rapid and complete mixing versus incomplete mixing), he or she would again consult the water quality standards to determine the maximum size of the dilution allowance or mixing zone that may be considered in water quality modeling calculations.

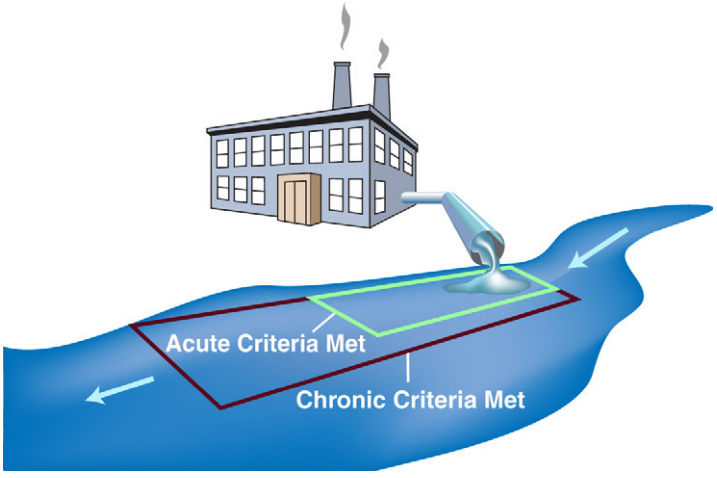
Dilution Allowances in Rapid and Complete Mix Situations

The maximum permissible dilution allowance for rivers and streams under conditions of rapid and complete mixing should be indicated in the water quality standards or standards implementation policy. For example, some water quality standards allow a permit writer to use up to 100 percent of the critical low flow of a river or stream as a dilution allowance in water quality models and calculations when there is rapid and complete mixing. In some cases, water quality standards implement a factor of safety by permitting only a percentage of the critical low flow to be used as a dilution allowance, even when there is rapid and complete mixing under critical conditions. Water quality standards might incorporate such a factor of safety to account for any uncertainty related to other conditions in the waterbody or to ensure that some assimilative capacity is retained downstream of the discharge being permitted. Recall as well that for some pollutants (e.g., pathogens in waters designated for primary contact recreation, bioaccumulative pollutants), the water quality standards or implementing procedures might not authorize any dilution allowance, even where the effluent and receiving water mix rapidly and completely.

Dilution Allowances and Regulatory Mixing Zones in Incomplete Mix Situations

In an incomplete mixing situation, the water quality standards or implementation policies might allow some consideration of ambient dilution. Rather than permitting as much as 100 percent of the critical low flow as a dilution allowance, however, they will likely specify either a limited dilution allowance (such as a percentage of the critical low flow) or the maximum size of a regulatory mixing zone. A regulatory *mixing zone* is a limited area or volume of water where initial dilution of a discharge takes place and within which the water quality standards allow certain water quality criteria to be exceeded. While the criteria may be exceeded within the mixing zone, the use and size of the mixing zone must be limited such that the waterbody as a whole will not be impaired and such that all designated uses are maintained as discussed in section 6.2.5.3 below. Exhibit 6-8 is a diagram illustrating the concept of a regulatory mixing zone. The mixing zone often is a simple geometric shape inside of which a water quality criterion may be exceeded. The geometric shape does not characterize how mixing actually occurs. Actual mixing is described using field studies and a water quality model.

Exhibit 6-8 Regulatory mixing zones for aquatic life criteria



Note that Exhibit 6-8 above illustrates two different mixing zones, one for an acute aquatic life criterion and one for a chronic aquatic life criterion. The water quality standards could specify different maximum mixing zones sizes for different pollutants, different types of criteria, and different waterbody types. Exhibit 6-9 provides examples of different maximum mixing zone sizes and dilution allowances.

Exhibit 6-9 Examples of maximum mixing zone sizes or dilution allowances under incomplete mixing conditions by waterbody type*

For rivers and streams:
- Mixing zones cannot be larger than 1/4 of the stream width and 1/4 mile downstream
- Mixing must be less than 1/2 stream width with a longitudinal limit of 5 times the stream width
- Dilution cannot be greater than 1/3 of the critical low flow

For lakes and the ocean:
- Mixing zones for lakes cannot be larger than 5% of the lake surface
- A maximum of 4:1 dilution is available for lake discharges
- A maximum of 10:1 dilution is available for ocean discharges
- The maximum size mixing zone for the ocean is a 100-foot radius from the point of discharge

* Examples were adapted from state standards and procedures and do not reflect EPA guidance or recommendations.

Permit writers should always check the applicable water quality standards to see if mixing zones are permitted and determine the maximum mixing zone size for the waterbody type, pollutant of concern, and specific criterion being considered.

6.2.5.3 Restrictions on Dilution Allowance or Mixing Zone Size

In addition to specifying the maximum dilution allowance or mixing zone size allowed under both rapid and complete mixing conditions and incomplete mixing conditions, the water quality standards or implementation policies generally include constraints that could further limit the available dilution allowance or mixing zone size to something less than the absolute maximum allowed. For example, one restriction on the size of the acute mixing zone could be that it must be small enough to ensure that the potential time of exposure of aquatic organisms to a pollutant concentration above the acute criterion is very short, and organisms passing through that acute mixing zone will not die from exposure to the pollutant. Such a restriction might lead the permitting authority to give a discharger an acute mixing zone for a specific pollutant that is smaller than the maximum size allowed by the water quality standards or to not allow any acute mixing zone at all. Other possible restrictions on dilution and mixing zone size include preventing impairment of the integrity of the waterbody as a whole and preventing significant risks to human health. For example, a permitting authority might restrict the size of a mixing zone for a human health criterion to prevent the mixing zone from overlapping a drinking water intake.

6.3 Determine the Need for WQBELs

After determining the applicable water quality standards and characterizing the effluent and receiving water, a permit writer determines whether WQBELs are needed. This section provides an overview of that process.

6.3.1 Defining Reasonable Potential

EPA regulations at § 122.44(d)(1)(i) state, "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level that will *cause*, have the *reasonable potential to cause*, or *contribute* to an excursion above any [s]tate water quality standard, including [s]tate narrative criteria for water quality." [emphasis added] Because of that regulation, EPA and many authorized NPDES states refer to the process that a permit writer uses to determine whether a WQBEL is required in an NPDES permit as a *reasonable potential analysis*. Wording the requirements of the regulation another way, a reasonable potential analysis is used to determine whether a discharge, alone or in combination with other sources of pollutants to a waterbody and under a set of conditions arrived at by making a series of reasonable assumptions, could lead to an excursion above an applicable water quality standard. The regulation also specifies that the reasonable potential determination must apply not only to numeric criteria, but also to narrative criteria (e.g., *no toxics in toxic amounts*, *presence of pollutants or pollutant parameters in amounts that would result in nuisance algal blooms*). A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques, as described above, or using a non-quantitative approach. Both approaches are discussed below.

6.3.2 Conducting a Reasonable Potential Analysis Using Data

When determining the need for a WQBEL, a permit writer should use any available effluent and receiving water data as well as other information pertaining to the discharge and receiving water (e.g., type of industry, existing TBELs, compliance history, stream surveys), as the basis for a decision. The permit writer might already have data available from previous monitoring or he or she could decide to work with the permittee to generate data before permit issuance or as a condition of the new permit. EPA recommends that monitoring data be generated before effluent limitation development whenever possible. Monitoring should begin far enough in advance of permit development to allow sufficient time to conduct chemical analyses. Where data are generated as a condition of the permit (for example for a new permittee), it might be appropriate for the permit writer to include a reopener condition in the permit to allow the incorporation of a WQBEL if the monitoring data indicate that a WQBEL is required.

A reasonable potential analysis conducted with available data can be divided into four steps as shown in Exhibit 6-10 and discussed in detail below.

Exhibit 6-10 Steps of a reasonable potential analysis with available data

Step 1.	Determine the appropriate water quality model
Step 2.	Determine the expected receiving water concentration under critical conditions
Step 3.	Answer the question, "Is there reasonable potential?"
Step 4.	Document the reasonable potential determination in the fact sheet

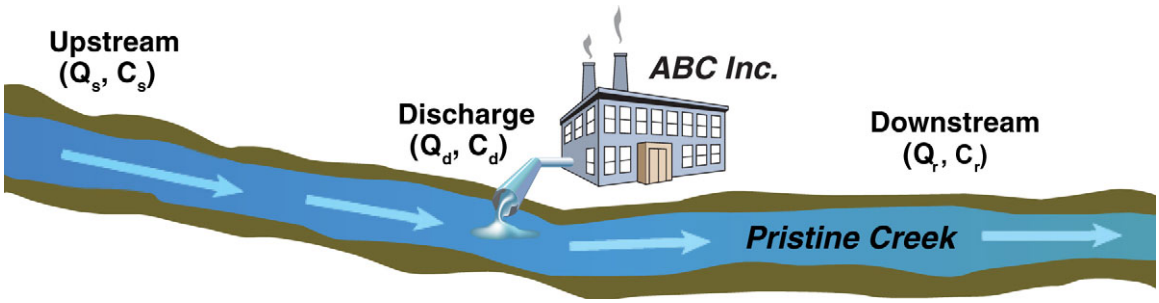
6.3.2.1 Step 1: Determine the Appropriate Water Quality Model

Steady-state or dynamic water quality modeling techniques can be used in NPDES permitting. As discussed in section 6.2.3 above, the examples in this manual consider only steady-state modeling techniques, which consider the impact of a discharge on the receiving water modeled under a single set of critical conditions.

The specific steady-state model used will depend on the pollutant or parameter of concern and whether there is rapid and complete mixing or incomplete mixing of the effluent and the receiving water under critical conditions. For example, to model dissolved oxygen in a river, the permit writer might choose the Streeter-Phelps equation. For modeling heavy metals in an incomplete mix situation, the permit writer might choose the CORMIX model. For pollutants such as BOD, nutrients, or non-conservative parameters, the effects of biological activity and reaction chemistry should be modeled, in addition to the effects of dilution, to assess possible impacts on the receiving water. This manual focuses only on dilution of a pollutant discharged to the receiving water and does not address modeling biological activity or reaction chemistry in receiving waters. For additional information, permit writers should discuss modeling that accounts for biological activity or reaction chemistry with water quality modelers or other water quality specialists as needed and consult EPA's Water Quality Models and Tools Website <www.epa.gov/waterscience/models/>.

For many pollutants such as most toxic (priority) pollutants, conservative pollutants, and pollutants that can be treated as conservative pollutants when near-field effects are of concern, if there is rapid and complete mixing in a river or stream, the permit writer could use a simple mass-balance equation to model the effluent and receiving water. The simple mass-balance equation as applied to a hypothetical facility, ABC, Inc., discharging Pollutant Z to a free-flowing stream called Pristine Creek is presented in Exhibit 6-11 below.

Exhibit 6-11 Simple mass-balance equation



Mass = **Flow** (Q) in million gallons per day (mgd) or cubic feet per second (cfs) X **Pollutant concentration** (C) in milligrams per liter (mg/L)

$$Q_sC_s + Q_dC_d = Q_rC_r$$

where

Q_s	=	stream flow in mgd or cfs above point of discharge
C_s	=	background in-stream pollutant concentration in mg/L
Q_d	=	effluent flow in mgd or cfs
C_d	=	effluent pollutant concentration in mg/L
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

6.3.2.2 Step 2: Determine the Expected Receiving Water Concentration under Critical Conditions

When using a steady-state model, the permit writer, or water quality modeler, determines the impact of the effluent discharge on the receiving water under critical conditions. This step examines how this steady-state analysis is conducted in situations where there is incomplete mixing and then provides a detailed discussion of this analysis for situations where there is rapid and complete mixing.

How are *critical conditions* defined?

When using a steady-state water quality model, permit writers generally input values that reflect critical conditions. State permitting procedures should guide permit writers in this task. When characterizing the effluent and receiving water for water quality-based permitting, the permit writer should follow the permitting authority's policies and procedures for selecting the critical conditions to use in a steady-state model. The discussion in section 6.2.4 above provides a discussion of how those values might be selected.

Permit writers generally would input into a steady-state model for a reasonable potential analysis the critical conditions identified in the effluent and receiving water characterization discussed in section 6.2.4 above. Recall that critical conditions include the following:

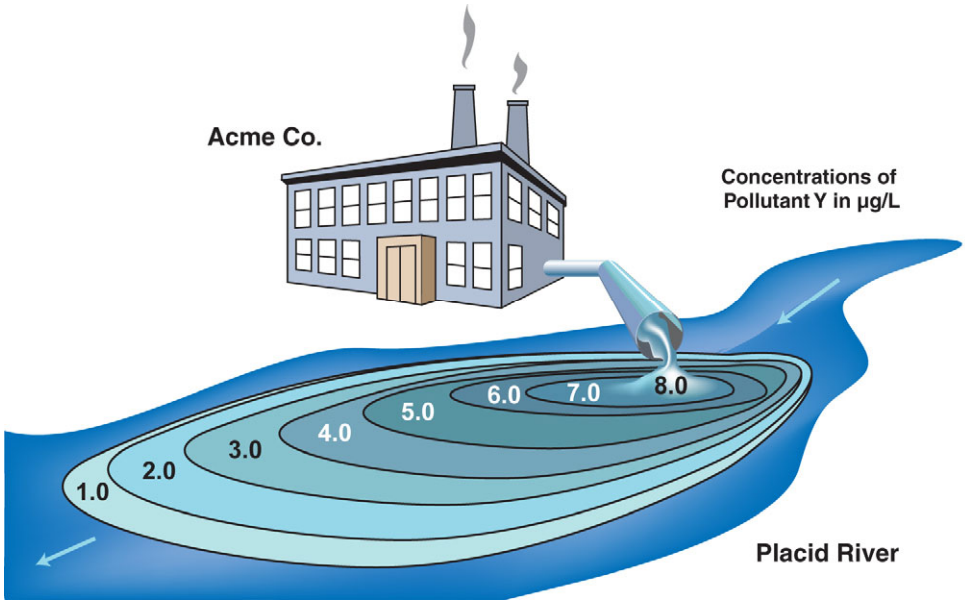
- Effluent critical conditions
  - Flow.
  - Pollutant concentration.
- Receiving water critical conditions
  - Flow (for rivers and streams).
  - Pollutant concentration.
  - Other receiving water characteristics such as tidal flux, temperature, pH, or hardness (depending on the waterbody and pollutant of concern)

As discussed in section 6.2.4.1 above, EPA and other permitting authorities have developed guidance for determining those critical conditions. Permit writers should rely on their permit authority's policies and procedures or past practices to determine values for all other critical conditions.

Expected Receiving Water Concentration in an Incomplete Mixing Situation

Exhibit 6-12 illustrates a situation where there is incomplete mixing of a discharge from a hypothetical facility, Acme Co., with the receiving water, the Placid River. The concentration of the pollutant of concern discharged by Acme Co. (Pollutant Y) is highest nearest the point of discharge and gradually decreases until the pollutant is completely mixed with the receiving water. To determine expected receiving water concentrations resulting from the Acme Co.'s discharge of Pollutant Y to the Placid River, the permit writer, or water quality modeler, would use the appropriate incomplete mixing model, calibrated to actual observations from field studies or dye studies, to simulate mixing under critical conditions. In Step 3 below, the concentrations of the pollutant of concern in the receiving water, as predicted by the water quality model, will be overlaid by a regulatory mixing zone established by the applicable water quality standard to determine whether WQBELs are needed.

Exhibit 6-12 Example of receiving water concentrations in an incomplete mixing situation determined using an incomplete mixing water quality model



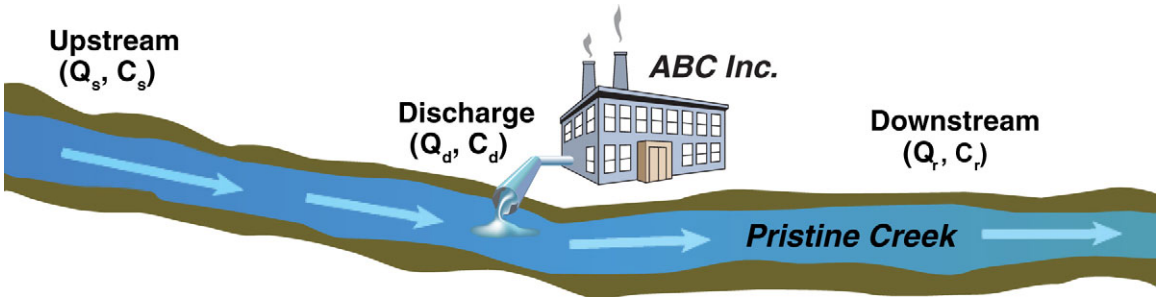
Expected Receiving Water Concentration in Rapid and Complete Mixing Situation

For many pollutants, if there is rapid and complete mixing in a river or stream, the permit writer could use the simple mass-balance equation presented in Exhibit 6-11 above to determine the expected receiving water concentration of the pollutant of concern under critical conditions. As noted previously, the simple mass-balance equation is a very basic steady-state model that can be used for most toxic pollutants, conservative pollutants, and other pollutants for which near-field effects are the primary concern. In Exhibit 6-13, that equation is applied to ABC Inc.'s, discharge of Pollutant Z (a conservative pollutant) to Pristine Creek under conditions of rapid and complete mixing. The mass-balance equation is rearranged to show how it would be used in a reasonable potential analysis.

To use the simple mass-balance equation to predict receiving water impacts for a reasonable potential analysis, the permit writer needs to input one value for each variable and solve the equation for C_r, the downstream concentration of the pollutant. Because this model, like other steady-state models, uses a single value for each variable, the permit writer should be sure that the values selected reflect critical conditions for the discharge and the receiving water. In Exhibit 6-14, those critical conditions have been identified and the equation has been solved for C_r.

It is important for permit writers to remember that, in some situations, the selected steady-state model could be more complex than the simple mass-balance equation shown. For example, there could be other pollutant sources along the stream segment; the pollutant might not be conservative (e.g., BOD); or the parameter to be modeled might be affected by multiple pollutants (e.g., dissolved oxygen affected by BOD and nutrients). For illustrative purposes, this example focuses on a situation where using a simple mass-balance equation is sufficient (i.e., rapid and complete mixing of a conservative pollutant in a river or stream under steady-state conditions).

Exhibit 6-13 Mass-balance equation for reasonable potential analysis for conservative pollutant under conditions of rapid and complete mixing



The mass-balance equation can be used to determine whether the discharge from ABC Inc., would cause, have the reasonable potential to cause, or contribute to an excursion above the water quality standards applicable to Pristine Creek. The equation is used to predict the concentration of Pollutant Z, a conservative pollutant, in Pristine Creek under critical conditions. The predicted concentration can be compared to the applicable water quality criteria for Pollutant Z. Assume the discharge mixes rapidly and completely with Pristine Creek.

Mass	=	**Flow** (Q) in million gallons per day (mgd) or cubic feet per second (cfs)	X	**Pollutant concentration** (C) in milligrams per liter (mg/L)

$$Q_sC_s + Q_dC_d = Q_rC_r$$

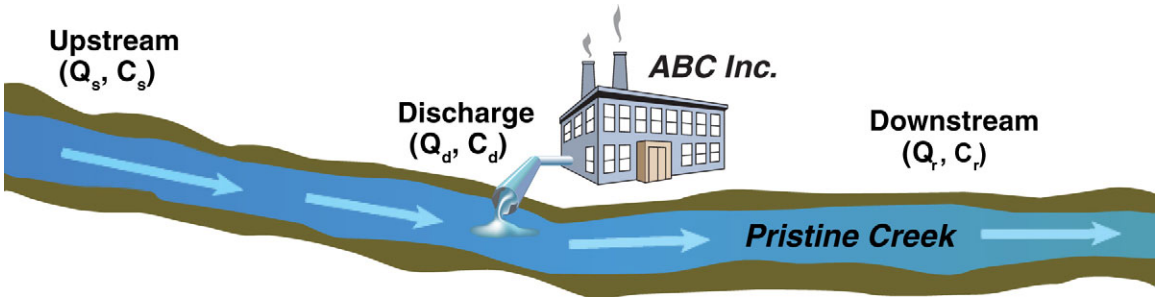
where

Q_s	=	critical stream flow in mgd or cfs above point of discharge
C_s	=	critical background in-stream pollutant concentration in mg/L
Q_d	=	critical effluent flow in mgd or cfs
C_d	=	critical effluent pollutant concentration in mg/L
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs ($Q_r = Q_s + Q_d$)
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

Rearrange the equation to determine the concentration of Pollutant Z in the waterbody downstream of a discharge under critical conditions:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

Exhibit 6-14 Example of applying mass-balance equation to conduct reasonable potential analysis for conservative pollutant under conditions of rapid and complete mixing



Mass-Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

Dividing both sides of the mass-balance equation by Q_r gives the following:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

where C_r is the receiving water concentration downstream of the discharge

The following values are known for ABC Inc. and Pristine Creek:

Q_s = critical upstream flow (water quality standards allow a dilution allowance of up to 100% of 1Q10 low flow for rapid and complete mixing)	= 1.20 cfs
C_s = critical upstream concentration of Pollutant Z in Pristine Creek	= 0.75 mg/L
Q_d = critical discharge flow	= 0.55 cfs
C_d = statistically projected critical discharge concentration of Pollutant Z	= 2.20 mg/L
Q_r = downstream flow = Q_d + Q_s	= 0.55 + 1.20 = 1.75 cfs
Acute aquatic life water quality criterion for Pollutant Z in Pristine Creek	= 1.0 mg/L

Find the projected downstream concentration (C_r) by inserting the given values into the equation as follows:

$$C_r = \frac{(0.55\,\text{cfs})(2.20\,\text{mg/L}) + (1.20\,\text{cfs})(0.75\,\text{mg/L})}{(1.75\,\text{cfs})}$$

C_r = 1.2 mg/L of Pollutant Z*

* calculated to 2 significant figures

6.3.2.3 Step 3: Answer the Question, Is There Reasonable Potential?

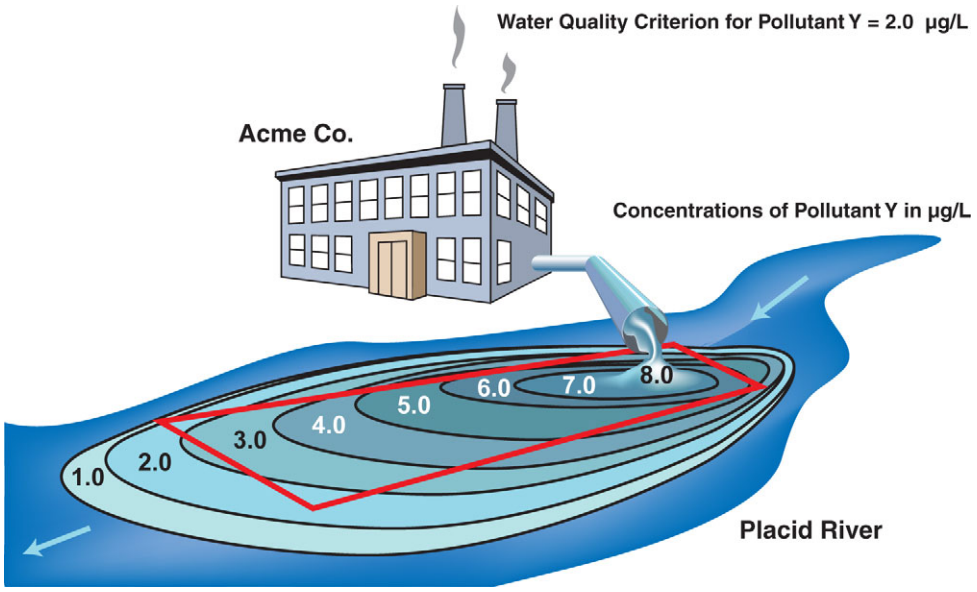
The next step in the reasonable potential analysis is to consider the results of water quality modeling to answer the question, *Is there reasonable potential?*

- For most pollutants, if the receiving water pollutant concentration projected by a steady-state model (e.g., a simple mass-balance equation or a more complex model) exceeds the applicable water quality criterion, there is *reasonable potential*, and the permit writer must calculate WQBELs. (Note that for dissolved oxygen, reasonable potential would occur if the water quality model indicates that the projected effluent concentration of the oxygen-demanding pollutants would result in depletion of dissolved oxygen below acceptable values in the receiving water).
- If the projected concentration is equal to or less than the applicable criterion, there is no reasonable potential and, thus far, there is no demonstrated need to calculate WQBELs.

Reasonable Potential Determination in an Incomplete Mixing Situation

To determine whether there is reasonable potential in an incomplete mixing situation, the permit writer would compare the projected concentration of the pollutant of concern at the edge of the regulatory mixing zone or after accounting for the available dilution allowance, with the applicable water quality criterion. Exhibit 6-15 illustrates the reasonable potential determination for Acme Co. in a situation where the regulatory mixing zone is described by a geometric shape. In the example, the water quality criterion for Pollutant Y being considered is 2.0 micrograms per liter (µg/L). The illustration shows that at many points along the edge of the regulatory mixing zone specified by the water quality standards, which is represented by the rectangle, the concentration of Pollutant Y exceeds 2.0 µg/L. Therefore, there is reasonable potential, and the permit writer must calculate WQBELs for Pollutant Y for Acme Co.

Exhibit 6-15 Reasonable potential determination in an incomplete mixing situation



Reasonable Potential Determination in a Rapid and Complete Mixing Situation

In the rapid and complete mixing example for ABC, Inc., shown in Exhibit 6-14 above, a projected downstream concentration (C_r) of 1.2 mg/L of Pollutant Z was calculated. The permit writer would compare the calculated concentration to the acute aquatic life water quality criterion of 1.0 mg/L for Pollutant Z in Pristine Creek presented in Exhibit 6-14. Because 1.2 mg/L > 1.0 mg/L, the projected downstream concentration exceeds the water quality criterion; therefore, there is a reasonable potential for the water quality criterion to be exceeded, and the permit writer must calculate WQBELs for Pollutant Z.

A permit writer should repeat the reasonable potential analysis for all applicable criteria for the pollutant of concern and must remember that the critical conditions could differ depending on the criterion being evaluated. For example, the critical stream flow used when considering the acute aquatic life criterion might be the 1Q10 low flow, whereas the critical stream flow used when considering the chronic aquatic life criterion might be the 7Q10 low flow. If calculations demonstrate that the discharge of a pollutant of concern would cause, have the reasonable potential to cause, or contribute to an excursion of *any one* of the applicable criteria for that pollutant, the permit writer must develop WQBELs for that pollutant.

In addition, it is important for permit writers to remember that they must repeat the reasonable potential analysis for each pollutant of concern and calculate WQBELs where there is reasonable potential. For each pollutant for which there is no reasonable potential, the permit writer should consider whether there are any existing WQBELs in the previous permit and whether they should be retained. The permit writer would complete an anti-backsliding analysis (see Chapter 7 of this manual) to determine whether it is possible to remove any existing WQBELs from the reissued permit.

6.3.2.4 Step 4: Document the Reasonable Potential Determination in the Fact Sheet

As a final step, permit writers need to document the details of the reasonable potential analysis in the NPDES permit fact sheet. The permit writer should clearly identify the information and procedures used to determine the need for WQBELs. The goal of that documentation is to provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how each pollutant was evaluated, including the basis (i.e., reasonable potential analysis) for including or not including a WQBEL for any pollutant of concern.

6.3.3 Conducting a Reasonable Potential Analysis without Data

State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available. For example, as noted in section 6.2.1.2 above, where there is a pollutant with a WLA from a TMDL, a permit writer must develop WQBELs or other permit requirements consistent with the assumptions of the TMDL. Even without a TMDL, a permitting authority could, at its own discretion, determine that WQBELs are needed for any pollutant associated with impairment of a waterbody. A permitting authority might also determine that WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).

Types of information that the permit writer might find useful in a qualitative approach to determining reasonable potential include the following:

- Effluent variability information such as history of compliance problems and toxic impacts.
- Point and nonpoint source controls such as existing treatment technology, the type of industry, POTW treatment system, or BMPs in place.
- Species sensitivity data including in-stream data, adopted water quality criteria, or designated uses.
- Dilution information such as critical receiving water flows or mixing zones.

The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and *must* do so where required by federal and state regulations. A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern.

After evaluating all available information characterizing the nature of the discharge without effluent monitoring data for the pollutant of concern, if the permit writer is not able to decide whether the discharge causes, has the reasonable potential to cause, or contributes to an excursion above a water

quality criterion, he or she may determine that effluent monitoring should be required to gather additional data. The permit writer might work with the permittee to obtain data before permit issuance, if sufficient time exists, or could require the monitoring as a condition of the newly issued or reissued permit. The permit writer might also include a clause in the permit that would allow the permitting authority to reopen the permit and impose an effluent limitation if the required monitoring establishes that there is reasonable potential that the discharge will cause or contribute to an excursion above a water quality criterion.

6.4 Calculate Parameter-specific WQBELs

If a permit writer has determined that a pollutant or pollutant parameter is discharged at a level that will cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard, the permit writer must develop WQBELs for that pollutant parameter. This manual presents the approach recommended by EPA's TSD for calculating WQBELs for toxic (priority) pollutants. Many permitting authorities apply those or similar procedures to calculate WQBELs for toxic pollutants and for a number of conventional or nonconventional pollutants with effluent concentrations that tend to follow a lognormal distribution. Permit writers should consult permitting authority policies and procedures to determine the methodology specific to their authorized NPDES permitting program, including the approach for pollutants with effluent concentrations that do not follow a lognormal distribution.

6.4.1 Calculating Parameter-specific WQBELs from Aquatic Life Criteria

The TSD process for calculating WQBELs from aquatic life criteria follows five steps as shown in Exhibit 6-16 and discussed in detail below.

Exhibit 6-16 Calculating parameter-specific WQBELs from aquatic life criteria

Step 1.	Determine acute and chronic WLAs
Step 2.	Calculate long-term average (LTA) concentrations for each WLA
Step 3.	Select the lowest LTA as the performance basis for the permitted discharger
Step 4.	Calculate an average monthly limitation (AML) and a maximum daily limitation (MDL)
Step 5.	Document the calculation of WQBELs in the fact sheet.

6.4.1.1 Step 1: Determine Acute and Chronic WLAs

Before calculating a WQBEL, the permit writer will first need to determine the appropriate WLAs for the point source discharge based on both the acute and chronic criteria. A WLA may be determined from a TMDL or calculated for an individual point source directly. Where an EPA-approved TMDL has been developed for a particular pollutant, the WLA for a specific point source discharger is the portion of that TMDL that is allocated to that point source, as discussed in section 6.2.1.2 above. Where no TMDL is available, a water quality model generally is used to calculate a WLA for the specific point source discharger. The WLA is the loading or concentration of pollutant that the specific point source may discharge while still allowing the water quality criterion to be attained downstream of that discharge. Of course, the WLA calculation should take into account any reserve capacity, safety factor, and contributions from other point and nonpoint sources as might be required by the applicable water quality standards regulations or implementation policies.

When a WLA is not given as part of a TMDL or where a separate WLA is needed to address the near-field effects of a discharge on water quality criteria, permit writers will, in many situations, use a steady-state water quality model to determine the appropriate WLA for a discharge. As discussed in section 6.3 above, steady-state models generally are run under a single set of critical conditions for protection of receiving water quality. If a permit writer uses a steady-state model with a specific set of critical conditions to assess reasonable potential, he or she generally may use the same model and critical conditions to calculate a WLA for the same discharge and pollutant of concern.

As with the reasonable potential assessment, the type of steady-state model used to determine a WLA depends on the type of mixing that occurs in the receiving water and the type of pollutant or parameter being modeled. As discussed in section 6.3.2 above, permit writers can use the mass-balance equation as a simple steady-state model for many pollutants, such as most toxic (priority) pollutants or any pollutant that can be treated as a conservative pollutant when considering near-field effects, if there is rapid and complete mixing in the receiving water. For pollutants or discharge situations that do not have those characteristics (e.g., non-conservative pollutants, concern about effects on a downstream waterbody), a water quality model other than the mass-balance equation would likely be more appropriate.

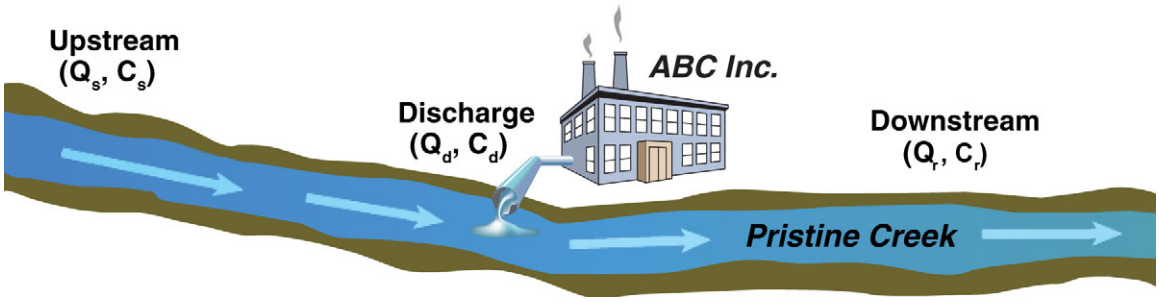
The mass-balance equation is presented again in Exhibit 6-17. In the exhibit, the equation is rearranged to show how it would be used to calculate a WLA for a conservative pollutant discharged to a river or stream under conditions of rapid and complete mixing.

6.4.1.2 Step 2: Calculate LTA Concentrations for Each WLA

The requirements of a WLA generally must be interpreted in some way to be expressed as an effluent limitation. The goal of the permit writer is to derive effluent limitations that are enforceable, adequately account for effluent variability, consider available receiving water dilution, protect against acute and chronic impacts, account for compliance monitoring sampling frequency, and assure attainment of the WLA and water quality standards. In developing WQBELs, the permit writer develops limitations that require a facility to perform in such a way that the concentration of the pollutant of concern in the effluent discharged is nearly always below the WLA.

To accomplish that goal, EPA has developed a statistical permit limitation derivation procedure to translate WLAs into effluent limitations *for pollutants with effluent concentration measurements that tend to follow a lognormal distribution*. EPA believes that this procedure, discussed in Chapter 5 of the TSD, results in defensible, enforceable, and protective WQBELs for such pollutants. In addition, a number of states have adopted procedures based on, but not identical to, EPA's guidance that also provide defensible, enforceable, and protective WQBELs. Permit writers should always use the procedures adopted by their permitting authority. In addition, permit writers should recognize that alternative procedures would be used to calculate effluent limitations for pollutants with effluent concentrations that cannot generally be described using a lognormal distribution.

Exhibit 6-17 Example of applying mass-balance equation to calculate WLAs for conservative pollutant under conditions of rapid and complete mixing



Mass Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

where

Q_s	=	background stream flow in mgd or cfs above point of discharge
C_s	=	background in-stream pollutant concentration in mg/L
Q_d	=	effluent flow in mgd or cfs
C_d	=	effluent pollutant concentration in mg/L **= WLA**
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

Rearrange the equation to determine the WLA (C_d) for ABC Inc., necessary to achieve the acute water quality criterion for Pollutant Z in Pristine Creek (C_r) downstream of the discharge:

$$C_d = \frac{Q_rC_r - Q_sC_s}{Q_d}$$

The following values are known for ABC Inc., and Pristine Creek:

Q_s = critical upstream flow (water quality standards allow a dilution allowance of up to 100% of 1Q10 low flow for rapid and complete mixing)	= 1.20 cfs
C_s = upstream concentration of Pollutant Z in Pristine Creek	= 0.75 mg/L
Q_d =discharge flow	= 0.55 cfs
Q_r = downstream flow = $Q_d + Q_s$	= 0.55 + 1.20 = 1.75 cfs
C_r = acute water quality criterion for Pollutant Z in Pristine Creek	= 1.0 mg/L

Determine the WLA for ABC Inc., by inserting the given values into the equation as follows:

$$\text{WLA for ABC Inc.} = C_d = \frac{(1.75\ \text{cfs})(1.0\ \text{mg/L}) - (1.20\ \text{cfs})(0.75\ \text{mg/L})}{(0.55\ \text{cfs})}$$

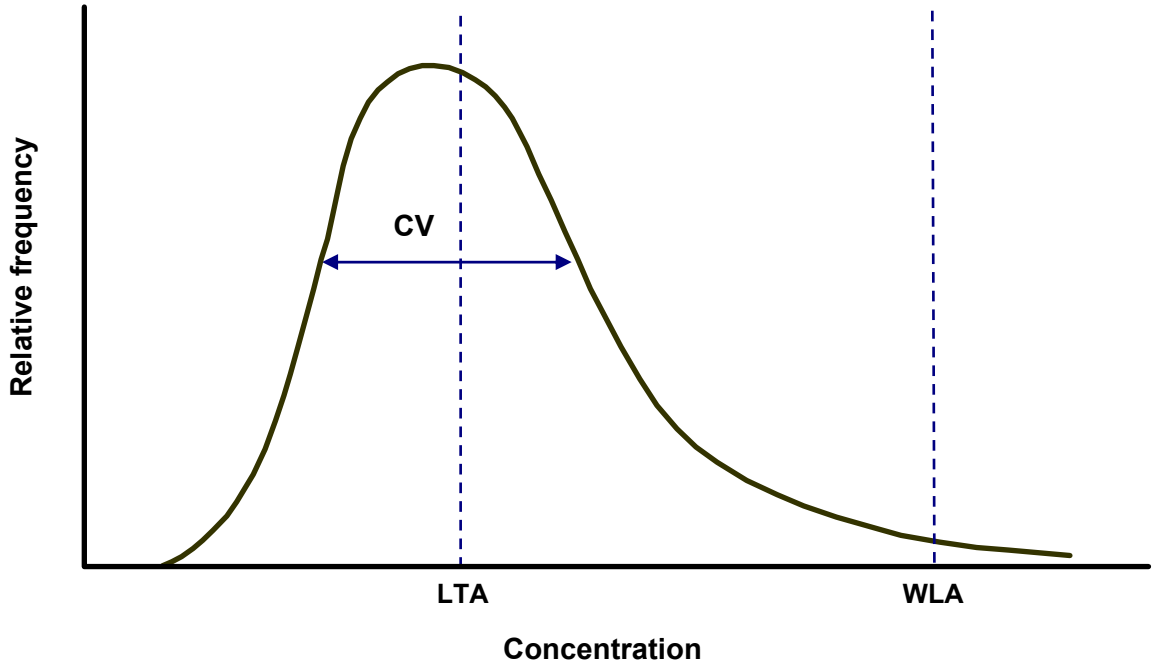
C_d = 1.5 mg/L of Pollutant Z*

* calculated to 2 significant figures

For those pollutants with effluent concentrations that do follow a lognormal distribution, the distribution can be described by determining a long-term average (or LTA) that ensures that the effluent pollutant concentration remains nearly always below the WLA and by the CV, a measure of the variability of data around the LTA. Exhibit 6-18 illustrates a lognormal distribution with the LTA, CV, and WLA highlighted.

When applying aquatic life criteria, a permit writer generally establishes a WLA based on the acute aquatic life criterion and a WLA based on the chronic aquatic life criterion. Thus, the permit writer determines two LTAs—one that would ensure that an effluent concentration is nearly always below the acute WLA and one that would ensure that an effluent concentration nearly always below the chronic WLA. Each LTA, acute and chronic, would represent a different performance expectation for the discharger.

Exhibit 6-18 Example of lognormal distribution of effluent pollutant concentrations and calculation of LTA



6.4.1.3 Step 3: Select the Lowest LTA as the Performance Basis for the Permitted Discharger

EPA recommends that WQBELs be based on a single performance expectation for a facility; therefore, once a permit writer has calculated LTA values for each WLA, he or she would select only one of those LTAs to define the required performance of the facility and serve as the basis for WQBELs. Because WQBELs must assure attainment of all applicable water quality criteria, the permit writer would select the lowest LTA as the basis for calculating effluent limitations. Selecting the lowest LTA would ensure that the facility's effluent pollutant concentration remains below all the calculated WLAs nearly all the time. Further, because WLAs are calculated using critical receiving water conditions, the limiting LTA would also ensure that water quality criteria are fully protected under nearly all conditions.

6.4.1.4 Step 4: Calculate an Average Monthly Limitation (AML) and a Maximum Daily Limitation (MDL)

The NPDES regulations at § 122.45(d) require that all effluent limitations be expressed, unless impracticable, as both AMLs and MDLs for all discharges other than POTWs and as both AMLs and average weekly limitations (AWLs) for POTWs. The AML is the highest allowable value for the average of daily discharges over a calendar month. The MDL is the highest allowable daily discharge measured during a calendar day or 24-hour period representing a calendar day. The AWL is the highest allowable value for the average of daily discharges over a calendar week. For pollutants with limitations expressed in units of mass, the daily discharge is the total mass discharged over the day. For limitations expressed in other units, the daily discharge is the average measurement of the pollutant over the period of a day.

In the TSD, EPA recommends establishing an MDL, rather than an AWL, for discharges of toxic pollutants from POTWs. That approach is appropriate for at least two reasons. First, the basis for the AWL for POTWs is the secondary treatment requirements discussed in section 5.1.1.1 of this manual and is not related to the need for assuring attainment of water quality standards. Second, an AWL, which could be the average of up to seven daily discharges, could average out peak toxic concentrations and, therefore, the discharge's potential for causing acute toxic effects might be missed. An MDL would be more likely to identify potential acutely toxic impacts.

Chapter 5 of the TSD includes statistical tools for calculating MDLs and AMLs from the LTA value selected in Step 3 above. Again, note that those procedures apply to *pollutants with effluent concentration measurements that tend to follow a lognormal distribution*. EPA has not developed guidance on procedures for calculating effluent limitations for pollutants with effluent concentrations that generally cannot be described using a lognormal distribution. For such pollutants, permit writers should use other procedures as recommended by their permitting authority in its policies, procedures, or guidance.

Whether using the TSD procedures or other procedures for calculating WQBELs, the objective is to establish limitations calculated to require treatment plant performance levels that, after considering acceptable effluent variability, would have a very low statistical probability of exceeding the WLA and, therefore, would comply with the applicable water quality standards under most foreseeable conditions.

6.4.1.5 Step 5: Document Calculation of WQBELs in the Fact Sheet

Permit writers should document in the NPDES permit fact sheet the process used to develop WQBELs. The permit writer should clearly identify the data and information used to determine the applicable water quality standards and how that information, or any applicable TMDL, was used to derive WQBELs and explain how the state's antidegradation policy was applied as part of the process. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the permit writer properly derived WQBELs for the NPDES permit.

6.4.2 Calculating Chemical-specific WQBELs based on Human Health Criteria for Toxic Pollutants

Developing WQBELs for toxic pollutants affecting human health is somewhat different from calculating WQBELs for other pollutants because (1) the exposure period of concern is generally longer (e.g., often a lifetime exposure) and (2) usually the average exposure, rather than the maximum exposure, is of concern. EPA's recommended approach for setting WQBELs for toxic pollutants for human health protection is to set the AML equal to the WLA calculated from the human health toxic pollutant criterion and calculate the MDL from the AML. Section 5.4.4 of the TSD describes statistical procedures used for such calculations for pollutants with effluent concentrations that follow a lognormal distribution. Once again, for pollutants with effluent concentrations that do not follow a lognormal distribution, permit writers should use other procedures as specified by their permitting authority.

If the permit writer calculates chemical-specific WQBELs from human health criteria, he or she should compare the limitations to any other calculated WQBELs (e.g., WQBELs based on aquatic life criteria) and TBELs and apply antidegradation and anti-backsliding requirements to determine the final limitations that meet all technology and water quality standards. As discussed above, that process should be documented in the fact sheet for the NPDES permit.

6.5 Calculate Reasonable Potential and WQBELs for WET

WET tests measure the degree of response of exposed aquatic test organisms to an effluent mixed in some proportion with control water (e.g., laboratory water or a non-toxic receiving water sample). WET testing is used as a second approach, in addition to the chemical-specific approach, to implementing water quality standards in NPDES permits. This section provides a brief introduction to WET testing and WET limitations.

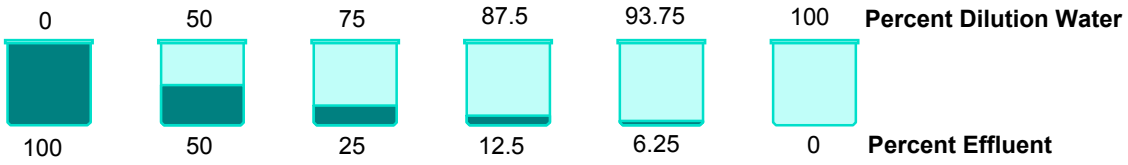
Test of Significant Toxicity (TST)

At the time of the writing of this guidance manual, EPA had recently published a new statistical approach that assesses the whole effluent toxicity (WET) measurement of wastewater effects on specific test organisms' ability to survive, grow, and reproduce. This new approach is called the Test of Significant Toxicity (TST) and is a statistical method that uses hypothesis testing techniques based on research and peer-reviewed publications. The hypothesis test under the TST approach examines whether an effluent, at the critical concentration (e.g., in-stream waste concentration [IWC]), and the control within a WET test differ by an unacceptable amount (the amount that would have a measured detrimental effect on the ability of aquatic organisms to thrive and survive). The TST implementation document and the TST technical document are available at the NPDES WET Website <www.epa.gov/npdes/wet>.

6.5.1 Types of WET Tests

In many WET tests, the effluent and control water are mixed in varying proportions to create a dilution series. Exhibit 6-19 is an example of a typical dilution series used in WET testing.

Exhibit 6-19 Example of typical dilution series



There are two types of WET tests: acute and chronic. An acute toxicity test usually is conducted over a short time, generally 96 hours or less, and the endpoint measured is mortality. The endpoint for an acute test is often expressed as an LC_{50} (i.e., the percent of effluent that is lethal to 50 percent of the exposed test organisms). A chronic toxicity test is usually conducted during a critical life phase of the organism and the endpoints measured are mortality and sub-lethal effects, such as changes in reproduction and growth. A chronic test can occur over a matter of hours or days, depending on the species tested and test endpoint. The endpoint of a chronic toxicity test often is expressed in one of the following ways:

- No observed effect concentration (NOEC), the highest concentration of effluent (i.e., highest percent effluent) at which no adverse effects are observed on the aquatic test organisms.
- Lowest observed effect concentration (LOEC), the lowest concentration of effluent that causes observable adverse effects in exposed test organisms.

- Inhibition concentration (IC), a point estimate of the effluent concentration that would cause a given percent reduction in a biological measurement of the test organisms.
- Effect concentration (EC), a point estimate of the effluent concentration that would cause an observable adverse effect in a given percentage of test organisms.

For additional information on WET monitoring and WET test methods, see section 8.2.4 of this manual.

6.5.2 Expressing WET Limitations or Test Results

There are two options for expressing WET limitations or test results. First, WET limitations or test results can be expressed directly in terms of the WET test endpoints discussed above (e.g., LC_{50}, NOEC, and IC_{25}). Alternatively, the limitations or test results can be expressed in terms of *toxic units* (TUs). A TU is the inverse of the sample fraction, calculated as 100 divided by the percent effluent. Exhibit 6-20 presents example TUs for expressing acute and chronic test results.

Exhibit 6-20 Example of toxic units

If an **acute test** result is a LC_{50} of 60 percent, that result can be expressed as

$$\frac{100}{60} = 1.7 \text{ acute toxic units} = 1.7 \text{ } TU_a$$

If a **chronic test** result is an IC_{25} of 40 percent effluent, that result can be expressed as

$$\frac{100}{40} = 2.5 \text{ chronic toxic units} = 2.5 \text{ } TU_c$$

It is important to distinguish acute TUs (TU_a) from chronic TUs (TU_c). The difference between TU_a and TU_c can be likened to the difference between miles and kilometers. Both miles and kilometers are used to measure distance, but a distance of 1.0 mile is not the same as a distance of 1.0 kilometer. Likewise, both TU_a and TU_c are expressions of the toxicity of an effluent, but 1.0 TU_a is not the same as 1.0 TU_c. It is possible, however, to determine the relationship between the acute toxicity of an effluent and the chronic toxicity of that same effluent, just as it is possible to determine the relationship between miles and kilometers (i.e., through a conversion factor). Unlike the conversion between miles and kilometers that remains constant, the conversion factor between acute and chronic toxic units varies from effluent to effluent.

For an effluent, the permit writer could develop a conversion factor that would allow conversion of TU_a into equivalent TU_c or vice versa. This conversion factor is known as an acute-to-chronic ratio (ACR) for that effluent. The ACR for an effluent may be calculated where there are at least 10 sets of paired acute and chronic WET test data available. The ACR is determined by calculating the mean of the individual ACRs for each pair of acute and chronic WET tests. Where there are not sufficient data to calculate an ACR for an effluent (i.e., less than 10 paired sets of acute and chronic WET test data), EPA recommends a default value of ACR = 10. Exhibit 6-21 presents examples showing how the ACR converts TU_a into TU_c, how to calculate an ACR from existing data, and how, once an ACR is calculated, a permit writer could estimate the chronic toxicity of an effluent sample from its measured acute toxicity or vice versa.

Exhibit 6-21 Using the ACR

The ACR is expressed

$$ACR = \frac{\text{Acute Endpoint}}{\text{Chronic Endpoint}} = \frac{LC_{50}}{IC_{25}}$$

A TU is the inverse of the sample fraction. Therefore, by definition

$$TU_a = \frac{100}{LC_{50}} \qquad TU_c == \frac{100}{IC_{25}}$$

Consequently, toxicity as percent sample, may be expressed

$$LC_{50} = \frac{100}{TU_a} \qquad IC_{25} = \frac{100}{TU_c}$$

Substituting into the original equation gives

$$ACR = \frac{LC_{50}}{IC_{25}} = \frac{\frac{100}{TU_a}}{\frac{100}{TU_c}} = \frac{TU_c}{TU_a}$$

Example 1
Given: LC_{50} = 28%, IC_{25} = 10%

$$ACR = \frac{LC_{50}}{IC_{25}} = \frac{28\%}{10\%} = 2.8$$

Example 2
Given: TU_a = 3.6, TU_c = 10.0

$$ACR = \frac{TU_c}{TU_a} = \frac{10.0}{3.6} = 2.8$$

Example 3
Given: Toxicity data for a facility's effluent for *C. dubia*. as presented in the table to the right.

The ACR in the third column is calculated using the following equation:

$$ACR = \frac{LC_{50}}{IC_{25}}$$

LC_{50} (% effluent)	IC_{25} (% effluent)	ACR
62	10	6.2
18	10	1.8
68	25	2.7
61	10	6.1
63	25	2.5
70	25	2.8
17	5	3.4
35	10	3.5
35	10	3.5
35	25	1.4
47	10	4.7
Mean		**3.5**

Example 4
Given: TU_a = 1.8, ACR = 3.5

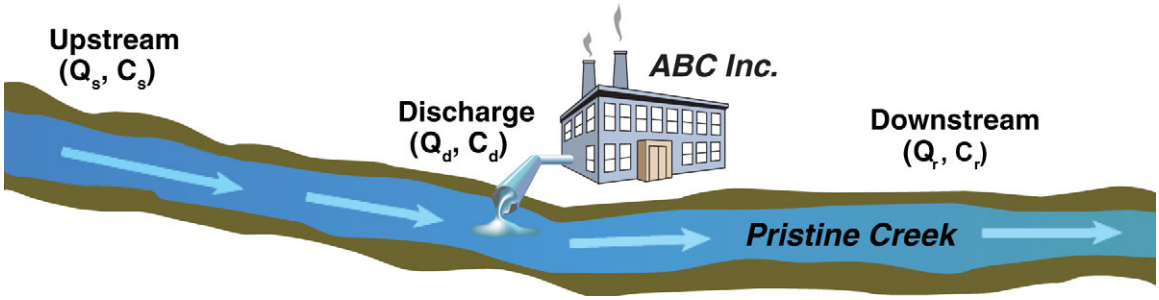
$$ACR = \frac{TU_c}{TU_a} \qquad TU_c = ACR \times TU_a$$

$$\text{Estimated } TU_c = ACR \times TU_a = 3.5 \frac{TU_c}{TU_a} \times 1.8\ TU_a = 6.3\ TU_c$$

6.5.3 Determining the Need for WET Limitations

If a state has numeric criteria for WET, a permit writer could use the results of WET tests to project acute or chronic toxicity in the receiving water after accounting for the applicable dilution allowance or mixing zone made available in the water quality standards. The permit writer would compare the projected toxicity of the receiving water to the applicable water quality criterion for WET. If the projected toxicity exceeds the applicable numeric water quality criterion for WET, the discharge would cause, have the reasonable potential to cause, or contribute to an excursion above the applicable water quality standards, and the permit writer must develop a WQBEL for WET [see § 122.44(d)(1)(iv)]. In that way, numeric criteria for WET can be treated similarly to chemical-specific criteria. Exhibit 6-22 provides an example of how the mass-balance equation is used to conduct a reasonable potential analysis for WET.

Exhibit 6-22 Example of mass-balance equation for a WET reasonable potential analysis



The mass-balance equation can be used to determine whether the discharge from ABC Inc. would cause, have the reasonable potential to cause, or contribute to toxicity in Pristine Creek that exceeds the numeric water quality criteria for acute or chronic toxicity. Assume the discharge mixes rapidly and completely with Pristine Creek.

Mass-Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

Dividing both sides of the mass-balance equation by Q_r gives the following:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

The following values are known for ABC Inc. and Pristine Creek:

Q_s = Critical upstream flow (1Q10 for acute protection)	= 23.6 cfs
(7Q10 for chronic protection)	= 70.9 cfs
C_s = Upstream toxicity in Pristine Creek (acute)	= 0 TU_a
(chronic)	= 0 TU_c
Q_d = Discharge flow	= 7.06 cfs
C_d = Discharge toxicity (acute)	= 2.50 TU_a
(chronic)	= 8.00 TU_c
Q_r = Downstream flow	= Q_d + Q_s
Acute Water Quality Criterion in Pristine Creek	= 0.3 TU_a
Chronic Water Quality Criterion in Pristine Creek	= 1.0 TU_c

Find the downstream concentration (C_r) by inserting the given values into the equation as follows:

For acute toxicity:

$$C_r = \frac{(7.06\ \text{cfs})(2.5\ TU_a) + (23.6\ \text{cfs})(0\ TU_a)}{7.06\ \text{cfs} + 23.6\ \text{cfs}} = 0.58\ TU_a$$

The downstream concentration (C_r) exceeds the water quality criterion for acute toxicity of 0.3 TU_a.

For chronic toxicity:

$$C_r = \frac{(7.06\ \text{cfs})(8.00\ TU_c) + (70.9\ \text{cfs})(0\ TU_c)}{7.06\ \text{cfs} + 70.9\ \text{cfs}} = 0.72\ TU_c$$

The downstream concentration (C_r) does not exceed the water quality criterion for chronic toxicity of 1.0 TU_c.

In Exhibit 6-22 above, the downstream concentration under critical conditions for the acute water quality criterion (C_r = 0.58 TU_a) exceeds the water quality criterion for acute toxicity (0.3 TU_a); therefore there is reasonable potential and WET limitations are required. WET limitations would be calculated in much the same way as limitations on specific chemicals. The limitations would be calculated to ensure that WET criteria are not exceeded after any available dilution or at the edge of the applicable mixing zone.

Where state water quality standards do not include numeric criteria for WET, a permit writer could evaluate the need for WQBELs for WET on the basis of narrative criteria; specifically, a narrative criterion stating that waterbodies must be free from *toxics in toxic amounts*. To make it easier for a permit writer to readily establish WET limitations in this situation, the permitting authority should have a policy for implementing the narrative criterion. Following the permitting authority's policy, if the permit writer determines that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative criterion, the regulations at § 122.44(d)(1)(v) require that the permit include WQBELs for WET unless the permit writer demonstrates that parameter-specific limitations for the effluent are sufficient to attain and maintain applicable numeric and narrative water quality criteria. In other words, the permit must include WET limitations unless the permit writer is able to determine the specific pollutants that are the source of toxicity and include parameter-specific limitations for those pollutants that assure, and will continue to assure, attainment of water quality standards. If there are no criteria in the state water quality standards for the specific parameters causing the toxicity, the permit writer can establish WQBELs using one of three approaches outlined in § 122.44(d)(1)(vi):

- Use EPA's national recommended criteria.
- Calculate a numeric criterion that will attain and maintain the applicable narrative criterion.
- Control the pollutant using an indicator parameter for the pollutant of concern.

A permit also could include a requirement to conduct a toxicity identification evaluation and toxicity reduction evaluation (TIE/TRE) as a special condition in an NPDES permit. (Chapter 9 of this manual presents more information on special conditions.) A TIE/TRE is a site-specific study designed to systematically investigate and identify the causes of effluent toxicity problems, isolate the sources of that toxicity, identify and implement appropriate toxicity control options, and confirm the effectiveness of those control options and the reduction in toxicity. The permit writer might require a TIE/TRE when WET limitations are exceeded or, if there are no WET limitations in the permit, where WET testing demonstrates an unacceptable level of effluent toxicity. Because WET testing indicates the degree of toxicity of an effluent, but does not specifically identify the cause of that toxicity or ways to reduce toxicity, a TIE/TRE is necessary to achieve compliance with effluent limitations or other effluent toxicity requirements in NPDES permits. If a TIE/TRE is not required through the special conditions section of the permit, it could be required via a CWA section 308 letter, a CWA section 309 administrative order, or a consent decree.

6.6 Antidegradation Review

Early in the permit development process, a permit writer should check the state's antidegradation policy and implementation methods to determine what tier(s) of protection, if any, the state has assigned to the proposed receiving water for the parameter(s) of concern. The regulations concerning antidegradation and each of the tiers are described above in section 6.1.1.3. The tier of antidegradation protection is important for determining the required process for developing the water quality-based permit limits and conditions. In some cases, where a waterbody is classified as Tier 3 for antidegradation purposes, the permit writer might find that it is not possible to issue a permit for the proposed activity.

If the state has not specified the tier, the permit writer will need to evaluate, in accordance with the state's implementation procedures, whether the receiving waterbody is of high water quality for the parameters of concern, and thus will require Tier 2 protection. After identifying the tier(s) of protection for the

proposed receiving waterbody and parameter(s) of concern, the permit writer should consult the state's antidegradation implementation procedures relevant to the tier(s).

The following sections provide methods permit writers should consider for implementing, through the WQBEL development process, the three levels of protection typically found in a state's antidegradation policy. Implementation of the state's antidegradation policy could have a significant effect on the calculation of WQBELs.

6.6.1 Tier 1 Implementation

All waterbodies receive at least Tier 1 protection. Tier 1 protection means that the permit writer must include limits in the permit sufficient to maintain and protect water quality necessary to protect existing uses. In practice, for a Tier 1 receiving waterbody, the permit writer typically calculates the WQBELs on the basis of the applicable criteria because the state's designated uses and criteria to protect those uses must be sufficient to protect the existing uses. If a Tier 1 waterbody is impaired for a parameter that would be present in the proposed discharge, the permit writer should identify and consult any relevant TMDLs to determine what quantity of pollutant (if any) is appropriate.

6.6.2 Tier 2 Implementation

For new or increased discharges that could potentially lower water quality in high-quality waters, Tier 2 protection provides the state with a framework for making decisions regarding the degree to which it will protect and maintain the high water quality. A new or expanded discharge permit application typically triggers a Tier 2 antidegradation review. Depending on the outcome of the review, the permit could be written to maintain the existing high water quality or could be written to allow some degradation.

Each state's antidegradation policy or implementation procedures should describe the Tier 2 antidegradation review process. Though the process varies among states, EPA's antidegradation regulation at § 131.12 outlines the common elements of the process. To permit a new or increased discharge that would lower water quality, the state is required to make a finding on the basis of the following:

- The state must find that allowing lower water quality is necessary for important social or economic development in the area in which the waters are located.
  - The state would perform an alternatives analysis to evaluate whether the proposed discharge is actually *necessary* (i.e., whether there are less degrading feasible alternatives) and that might include consideration of a wide range of alternatives (e.g. non-discharging options, relocation of discharge, alternative processes, and innovative treatments).
  - The state should provide a justification of important social or economic development (or both) that would occur as a result of permitting the proposed discharge.
- The state's finding must be made after full satisfaction of its own intergovernmental coordination and public participation provisions.
- The state must assure that the highest statutory and regulatory requirements for all new and existing point sources will be achieved.
- The state must assure that all cost-effective and reasonable BMPs for nonpoint source control will be achieved.

- The state must assure that water quality will still protect existing uses.

If, after fulfilling the above conditions of the Tier 2 antidegradation review process, the state makes a determination to allow a new or increased discharge that would lower water quality, the permit writer may include such limitations in the NPDES permit for that discharge provided the limitations meet all other applicable technology and water quality standards.

6.6.3 Tier 3 Implementation

States identify their own ONRWs for Tier 3 protection, which requires that the water quality be maintained and protected. This is the most stringent level of protection. ONRWs often include waters in national or state parks, wildlife refuges, and waters of exceptional recreational or ecological significance. Waterbodies can be given Tier 3 protection regardless of their existing level of water quality. Some states implement Tier 3 by prohibiting any new or increased discharges to ONRWs or their tributaries that would result in lower water quality, with the exception of some limited activities such as those that would result in temporary changes in water quality ultimately resulting in restoration. Some states allow increased discharges as long as they are offset by equivalent or greater reductions elsewhere in the waterbody.

In addition to Tiers 1, 2, and 3, some states have a class of waters considered outstanding to the state and for which the state might have specific antidegradation requirements. Such waterbodies are sometimes referred to as *Tier 2 ½* waters because implementation of the antidegradation policy for them affords a greater degree of protection than Tier 2 but more flexibility than Tier 3.

Chapter 4 of EPA's WQS Handbook and the *Water Quality Standards Regulation Advance Notice of Proposed Rulemaking* (64 FR 36742, July 7, 1998) include additional information on implementing antidegradation policies. The permit writer should clearly explain the antidegradation analysis and how it affects calculation of WQBELs in the fact sheet or statement of basis for the permit.

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[1] U.S. Environmental Protection Agency. 1994. *Water Quality Standards Handbook: Second Edition* (WQS Handbook). EPA 823-B-94-005a. U.S. Environmental Protection Agency, Office of Water, Washington DC. <www.epa.gov/waterscience/standards/handbook/>.

[2] U.S. Environmental Protection Agency. 2001. *Streamlined Water-Effect Ratio Procedure for Discharges of Copper*. EPA-822-R-01-005. U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/waterscience/criteria/copper/copper.pdf>.

[3] Davies, Tudor T. 1997. *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background.* U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/waterscience/library/wqcriteria/naturalback.pdf>.

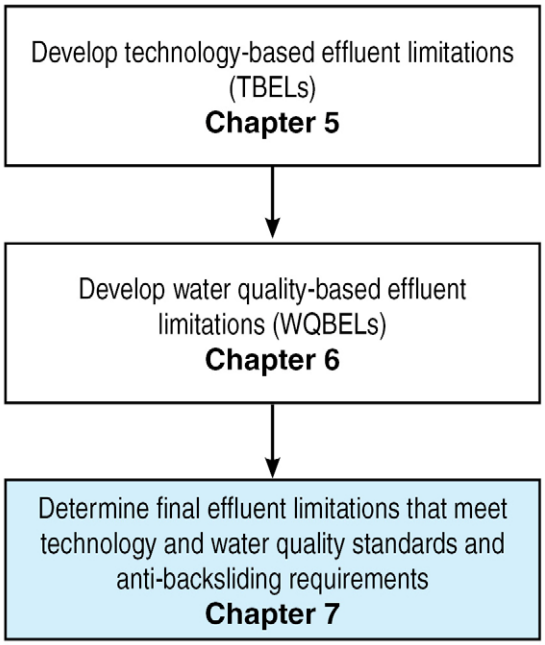
[4] U.S. Environmental Protection Agency. 1991. *Technical Support Document for Water Quality-Based Toxics Control* (TSD). EPA-505/2-90-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0264.pdf>.

[5] U.S. Environmental Protection Agency. 1990. *Biological Criteria: National Program Guidance for Surface Waters*. EPA-440/5-91-004. U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/bioindicators/html/biolcont.html>.

CHAPTER 7. Final Effluent Limitations and Anti-backsliding

As illustrated in Exhibit 7.1, after calculating applicable technology-based effluent limitations (TBELs) and water quality-based effluent limitations (WQBELs), the permit writer must determine the final effluent limitations that will be included in the National Pollutant Discharge Elimination System (NPDES) permit for each pollutant or pollutant parameter. For reissued permits, that determination must also include an assessment of whether the revised effluent limitations are consistent with the Clean Water Act (CWA) requirements and NPDES regulations related to anti-backsliding.

Exhibit 7-1 Developing effluent limitations



7.1 Determining Final Effluent Limitations

When determining the final effluent limitations, the permit writer must ensure that all applicable statutory and regulatory requirements, including technology and water quality standards, are fully implemented.

- The permit writer determines the calculated limitations (TBELs, WQBELs, or some combination of the calculated limitations) that will ensure that all applicable CWA standards are met.
- As noted above, for reissued permits, if any of the limitations are less stringent than limitations on the same pollutant in the previous NPDES permit, the permit writer then conducts an anti-backsliding analysis and, if necessary, revises the limitations accordingly. A detailed discussion of the anti-backsliding provisions of the CWA and the NPDES regulations is included below in Section 7.2.

In addition, the permit writer should clearly explain in the fact sheet for the permit how the final limitations in the permit were determined and how those limitations meet both technology and water quality standards (including antidegradation) and, where appropriate, how an anti-backsliding analysis was applied to the final effluent limitations.

7.2 Applying Anti-backsliding Requirements

As noted in Section 7.1, after selecting the calculated effluent limitations for a pollutant that ensure that all CWA standards are met, the permit writer applies anti-backsliding requirements, as necessary, to determine the final effluent limitations. In general, the term anti-backsliding refers to statutory and regulatory provisions that prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards less stringent than those established in the previous permit. There are, however, exceptions to the prohibition, and determining the applicability and circumstances of the exceptions requires familiarity with both the statutory and regulatory provisions that address anti-backsliding.

7.2.1 Anti-backsliding Statutory Provisions

Clean Water Act (CWA) section 402(o) expressly prohibits backsliding from certain existing effluent limitations. CWA section 402(o) consists of three main parts: (1) a prohibition on specific forms of backsliding, (2) exceptions to the prohibition, and (3) a *safety clause* that provides an absolute limitation on backsliding.

7.2.1.1 Statutory Prohibition Against Backsliding

First, CWA section 402(o)(1) prohibits the relaxation of effluent limitations for two situations:

- To revise an existing TBEL that was developed on a case-by-case basis using best professional judgment (BPJ) to reflect subsequently promulgated effluent limitations guidelines and standards (effluent guidelines) that would result in a less stringent effluent limitation.
- Relaxation of an effluent limitation that is based on state standards, such as water quality standards or treatment standards, unless the change is consistent with CWA section 303(d)(4). Section 303(d)(4) may be applied independently of section 402(o).

The prohibition against relaxation of effluent limitations is subject to the exceptions in CWA section 402(o)(2) and, for limitations based on state standards, the provisions of CWA section 303(d)(4). Those exceptions are outlined further in the following sections.

7.2.1.2 Exceptions for Case-by-Case TBELs

CWA section 402(o)(2) outlines specific exceptions to the general prohibition against revising an existing TBEL that was developed on a case-by-case basis using BPJ to reflect subsequently promulgated, less stringent effluent guidelines in a renewed, reissued, or modified permit. CWA section 402(o)(2) provides that relaxed limitations may be allowed where

- There have been material and substantial alternations or additions to the permitted facility that justify the relaxation.

- New information (other than revised regulations, guidance, or test methods) is available that was not available at the time of permit issuance and that would have justified a less stringent effluent limitation. If the effluent limitation was based on water quality standards, any changes must result in a decrease in pollutants discharged.
- Technical mistakes or mistaken interpretations of the law were made in issuing the permit under CWA section 402(a)(1)(b).
- Good cause exists because of events beyond the permittee's control (e.g., natural disasters) and for which there is no reasonably available remedy.
- The permit has been modified under CWA sections 301(c), 301(g), 301(h), 310(i), 301(k), 301(n), or 316(a).
- The permittee has installed and properly operated and maintained required treatment facilities but still has been unable to meet the effluent limitations (relaxation may be allowed only to the treatment levels actually achieved).

7.2.1.3 Exceptions for Limitations Based on State Standards

EPA has consistently interpreted CWA section 402(o)(1) to allow relaxation of WQBELs and effluent limitations based on state standards if the relaxation is consistent with the provisions of CWA section 303(d)(4) or if one of the exceptions in CWA section 402(o)(2) is met. The two provisions constitute independent exceptions to the prohibition against relaxation of effluent limitations. If either is met, relaxation is permissible.

CWA section 303(d)(4) has two parts: paragraph (A), which applies to *nonattainment waters*, and paragraph (B), which applies to *attainment waters*.

- **Nonattainment water:** CWA section 303(d)(4)(A) allows the establishment of a less stringent effluent limitation when the receiving water has been identified as not meeting applicable water quality standards (i.e., a *nonattainment water*) if the permittee meets two conditions. First, the existing effluent limitation must have been based on a total maximum daily load (TMDL) or other wasteload allocation (WLA) established under CWA section 303. Second, relaxation of the effluent limitation is only allowed if attainment of water quality standards will be ensured or the designated use not being attained is removed in accordance with the water quality standards regulations. This subsection does not provide an exception for establishing less stringent limitations where the original limitation was based on state permitting standards (e.g., state treatment standards) and was not based on a TMDL or WLA.
- **Attainment water:** CWA section 303(d)(4)(B) applies to waters where the water quality equals or exceeds levels necessary to protect the designated use, or to otherwise meet applicable water quality standards (i.e., an *attainment water*). Under CWA section 303(d)(4)(B), a limitation based on a TMDL, WLA, other water quality standard, or any other permitting standard may only be relaxed where the action is consistent with state's antidegradation policy.

Although the statute also identifies six exceptions in section 402(o)(2) where effluent limitations otherwise subject to the prohibition in section 402(o)(1) may be relaxed, the exceptions for technical mistakes or mistaken interpretations and permit modification, which are described above, would not apply to WQBELs.

7.2.1.4 Exception Safety Clause

CWA section 402(o)(3) is a *safety clause* that provides an absolute limitation on backsliding. This section of the CWA prohibits the relaxation of effluent limitations in all cases if the revised effluent limitation would result in a violation of applicable effluent guidelines or water quality standards, including antidegradation requirements. Thus, even if one or more of the backsliding exceptions outlined in the statute is applicable and met, CWA section 402(o)(3) acts as a floor and restricts the extent to which effluent limitations may be relaxed. The requirement affirms existing provisions of the CWA that require effluent limitations, standards, and conditions to ensure compliance with applicable technology and water quality standards.

7.2.2 Anti-backsliding Regulatory Provisions

Anti-backsliding regulations are found at Title 40 of the *Code of Federal Regulations* (CFR) 122.44(l). The regulations do not specifically address backsliding where a permittee seeks relaxation of an effluent limitation that is based on a state treatment standard or water quality standard [i.e., based on CWA section 301(b)(1)(C), 303(d) or 303(e)]. They do, however, address all other forms of backsliding.

First, the regulations at § 122.44(l)(1) restrict the relaxation of *final effluent limitations* and the relaxation of *standards or conditions* contained in existing permits. Thus, this regulation, in effect, addresses all types of backsliding not addressed in the CWA provisions (e.g., backsliding from limitations derived from effluent guidelines, from new source performance standards, from existing case-by-case limitations to new case-by-case limitations, and from conditions such as monitoring requirements that are not effluent limitations). Under the regulation, a permittee must meet one of the causes for modification under § 122.62 for the reissued permit to allow relaxation of such limitations, standards, or conditions.

Second, the regulations at § 122.44(l)(2)(i) directly reflect the specific prohibition imposed by CWA section 402(o) on backsliding where a permittee seeks to revise an existing case-by-case TBEL developed using BPJ to reflect a subsequently promulgated effluent guideline that is less stringent than the case-by-case requirement. The regulations include the same exceptions to this prohibition that are in CWA section 402(o)(2) and the same *safety clause* in CWA section 402(o)(3).

Thus, if the permit condition being considered for relaxation is either a case-by-case effluent limitation developed using BPJ or is any other limitation, standard, or condition other than an effluent limitation based on a state standard, the permit writer can apply the requirements in § 122.44(l). For effluent limitations based on state standards, the permit writer should apply the provisions of CWA sections 402(o) and 303(d)(4) directly. Exhibit 7-2 illustrates the process of applying the statutory and regulatory provisions addressing anti-backsliding.

Exhibit 7-2 Application of anti-backsliding requirements

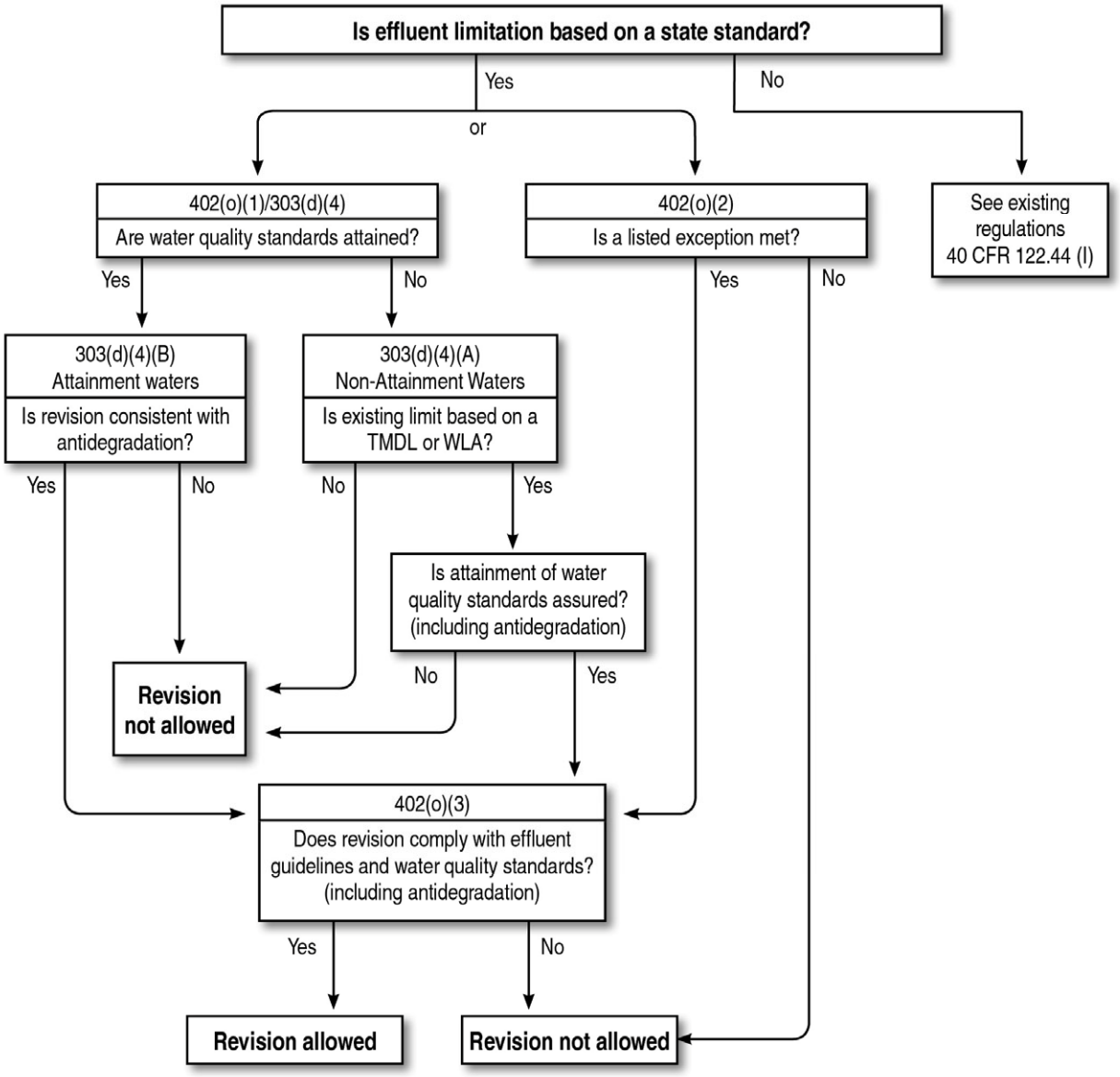


Exhibit 7-3 presents some examples of situations when backsliding might be a factor in effluent limitation development.

Exhibit 7-3 Backsliding examples

Example 1

- A publicly owned treatment works (POTW) seeks to relax its WQBEL for Pollutant X
- The current effluent limitation for Pollutant X is based on a TMDL and WLA for the POTW developed in accordance with § 130.7.
- The POTW is in compliance with its existing effluent limitation, and the applicable water quality standards for Pollutant X are attained.
- The POTW has developed new models with new river flow information. The models indicate that the water quality standards for Pollutant X would be maintained with a relaxed permit limitation.

Question:
May the effluent limitation for Pollutant X be relaxed?

Answer:
Possibly. Under the interpretation discussed above, WQBELs may be relaxed where one of the exceptions in CWA sections 402(o)(1) or (2) are met. In this case, although the new information from the models might meet the exception requirements criteria under CWA section 402(o)(2)(B)(i), CWA section 402(o)(2) will not justify the request unless the state reduces the pollutant loadings from other point sources or nonpoint sources of pollution. That is because, as discussed in Section 7.1 above, CWA section 402(o)(2) restricts the use of new information to cases where there is a decrease in the amount of pollutants being discharged.

The CWA section 402(o)(1) exceptions, on the other hand, might justify the request. In this case, the reference to CWA section 303(d)(4)(B) in CWA section 402(o)(1) is the relevant exception. CWA section 303(d)(4)(B) provides that, for receiving waters that meet water quality standards, permit limitations based on a TMDL or other WLA or other permit standard may be relaxed if the state's antidegradation policy requirements are met.

Example 2

- The state has established a technology-based treatment standard for fecal coliform pursuant to CWA section 301(b)(1)(C).
- The state later relaxes the standard in a revised regulation.
- A POTW, which has been in violation of its effluent limitation for fecal coliform based on the old standard, requests a revision of the limitation to reflect the new standard.
- Water quality standards for fecal coliform are not being attained.
- There was no TMDL or WLA developed. The basis of the effluent limitation was a state technology-based treatment standard.

Question:
May the fecal coliform effluent limitation be relaxed?

Answer:
No. Under CWA section 402(o)(1), the applicable provision is CWA section 303(d)(4)(A). This subsection does not authorize backsliding in this case (i.e., nonattainment waters) because it applies only to permit limitations based on a TMDL or other WLA. Here, the limitation in question is based on a state technology-based treatment standard.

Furthermore, if the permit sought to apply the exceptions in CWA section 402(o)(2), the new information provision would not allow the revision. For purposes of this section of the CWA, new information does not include *revised regulations*.

Exhibit 7-3 Backsliding examples (continued)

Example 3

- The state has a narrative water quality criterion of *no toxics in toxic amounts*.
- On the basis of WET testing data or other information, the state found that the discharge would cause, have the reasonable potential to cause, or contribute to an excursion of the water quality standards in the receiving water—specifically the narrative water quality criterion.
- The permitting authority imposed a WET limitation under § 122.44(d)(1)(v).
- The permittee determines that Pollutant Z is the cause of WET measured in its discharge.
- The permittee can demonstrate through sufficient data (including WET testing data) that an effluent limitation for Pollutant Z will assure compliance with the narrative water quality criterion as well as the state's numeric criteria for Pollutant Z, as required by § 122.44(d)(1)(v).

Question:
May the state modify the permit to delete the WET limitation and to add the effluent limitation for Pollutant Z?

Answer:
Possibly. CWA section 303(d)(4) might justify the action. The applicable provision is CWA section 303(d)(4)(B) because the narrative water quality criterion is currently attained. The permittee is complying with the existing WET limitation to attain and maintain the criterion. Under CWA section 303(d)(4)(B), the existing effluent limitation may be relaxed as long as antidegradation requirements are met and the relaxed limitation will not cause a violation of any effluent guidelines or water quality standards applicable to the discharge. In this case, it appears likely that a relaxation would be permissible because the permittee can demonstrate that the new limitation for Pollutant Z will assure compliance with both the narrative and numeric water quality criteria; however, the permit writer might consider continuing WET monitoring to identify other potential sources of toxicity in the future.

Example 4

- An industrial permittee seeks to revise its WQBEL of 60 mg/L for total suspended solids (TSS) to 100 mg/L, which is its actual discharge level.
- The current effluent limitation is based on a WLA from a TMDL developed in accordance with § 130.7.
- The water quality standards are not being attained. The ambient concentration of TSS exceeds the applicable water quality criteria.
- An effluent limitation of 100 mg/L is consistent with applicable effluent guidelines.
- New modeling information shows that the water quality standards will be attained with an effluent limitation of 75 mg/L TSS.

Question:
May the effluent limitation for TSS be revised from 60 mg/L to 100 mg/L?

Answer:
No; however, the effluent limitation could be relaxed to 75 mg/L under either CWA sections 402(o)(1) or (2) exceptions.

The water quality standards are not being attained because of TSS. Therefore, under CWA section 402(o)(1), the applicable exception is CWA section 303(d)(4)(A). In this case, the permitting authority may allow backsliding to 75 mg/L because the existing effluent limitation is based on a WLA from a TMDL, and the data show that attainment of the water quality standards is assured with an effluent limitation of 75 mg/L (but not with a limitation of 100 mg/L).

CHAPTER 8. Monitoring and Reporting Conditions

This chapter describes the monitoring and reporting conditions that a permit writer establishes in a National Pollutant Discharge Elimination System (NPDES) permit. The monitoring and reporting conditions require the permittee to conduct routine or episodic self-monitoring of permitted discharges and internal operations (where applicable) and report the analytical results to the permitting authority with the information necessary to evaluate discharge characteristics and compliance status. Periodic monitoring and reporting establish an ongoing record of the permittee's compliance status and, where violations are detected, create a basis for any necessary enforcement actions.

The monitoring and reporting conditions section of an NPDES permit generally includes specific requirements for the following items:

- Monitoring locations.
- Monitoring frequencies.
- Sample collection methods.
- Analytical methods.
- Reporting and recordkeeping requirements.

The following sections provide an overview of the considerations involved in determining appropriate monitoring, reporting, and recordkeeping requirements, and how to properly incorporate the appropriate requirements in an NPDES permit.

8.1 Establishing Monitoring Conditions

The NPDES regulations require facilities discharging pollutants to waters of the United States to periodically evaluate compliance with the effluent limitations established in their permits and provide the results to the permitting authority. A permit writer should consider several factors when determining the specific requirements to be included in the NPDES permit. Inappropriate or incomplete monitoring requirements can lead to inaccurate compliance determinations. Factors that could affect sampling location, sampling method, and sampling frequency include the following:

- Applicability of effluent limitations guidelines and standards (effluent guidelines).
- Wastestream and process variability.
- Access to sample locations.
- Pollutants discharged.
- Effluent limitations.
- Discharge frequencies (e.g., continuous versus intermittent).
- Effect of flow or pollutant load or both on the receiving water.
- Characteristics of the pollutants discharged.
- Permittee's compliance history.

8.1.1 Purposes of Monitoring

Monitoring is performed to determine compliance with effluent limitations established in NPDES permits, establish a basis for enforcement actions, assess treatment efficiency, characterize effluents and characterize receiving water.

Regulations requiring the establishment of monitoring and reporting conditions in NPDES permits are at Title 40 of the *Code of Federal Regulations* (CFR) 122.44(i) and 122.48. Regulations at § 122.44(i) require permittees to monitor pollutant mass (or other applicable unit of measure) and effluent volume and to provide other measurements (as appropriate) using the test methods established at Part 136. That subpart also establishes that NPDES permits (with certain specific exceptions as discussed in section 8.1.3 below) must require permittees to monitor for all limited pollutants and report data at least once per year.

Regulations at § 122.48 stipulate that all permits must specify requirements concerning the proper use, maintenance, and installation of monitoring equipment or methods (including biological monitoring methods when appropriate). NPDES permits must also specify the monitoring type, intervals, and frequency sufficient to yield data that are representative of the activity. The following sections focus on developing permit monitoring conditions that properly address these regulatory requirements.

8.1.2 Monitoring Location

The permit writer should specify the appropriate monitoring location in an NPDES permit to ensure compliance with the permit limitations and provide the necessary data to determine the effects of an effluent on the receiving water. The NPDES regulations do not prescribe exact monitoring locations; rather, the permit writer is responsible for determining the most appropriate monitoring location(s) and indicating the location(s) in the permit. Ultimately, the permittee is responsible for providing a safe and accessible sampling point that is representative of the discharge [§ 122.41(j)(1)].

The permit writer should consider the following questions when selecting a monitoring location:

- Is the monitoring location on the facility's property?
- Is the monitoring location accessible to the permittee and the permitting authority?
- Will the results be representative of the targeted wastestream?
- Is monitoring at internal points needed?

Permit writers should establish monitoring locations where the wastewater is well mixed, such as near a Parshall flume or at a location in a sewer with hydraulic turbulence. Weirs tend to enhance the settling of solids immediately upstream and the accumulation of floating oil or grease immediately downstream. Such locations should be avoided for sampling.

The permit writer can specify monitoring locations with either a narrative description or a diagram of the permittee's facility. Exhibit 8-1 provides examples of how to specify monitoring locations in a permit either by narrative or by diagram.

Exhibit 8-1 Examples of specifying monitoring locations in permits

Narrative

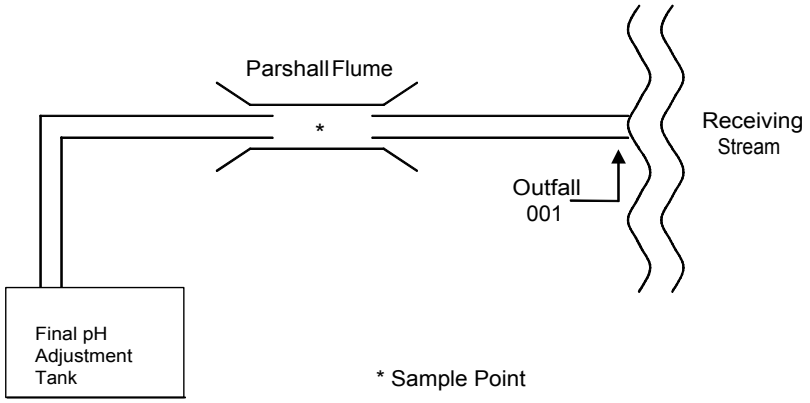
A. Monitoring Locations

1. Discharge from the Chemistry-Fine Arts Building must be sampled at the Parshall flume before the discharge point for Outfall 001.
2. Discharge from the Physics Building must be sampled at the Parshall flume before the discharge point for Outfall 002.
3. Discharge from the Research Lab No. 1 must be sampled at the Parshall flume before the discharge point for Outfall 003.

Diagram

A. Monitoring Locations

Outfall	Description
001	Discharge Pipe: Discharge of wastewater generated by all regulated metal finishing processes at the facility. Samples must be collected at the point indicated on the diagram below.



The monitoring location will vary depending on the type of monitoring required. The following sections discuss monitoring location considerations for each monitoring type.

8.1.2.1 Influent and source water monitoring locations

Influent monitoring is monitoring of a wastestream before that wastestream receives treatment. The permit writer should require influent monitoring when a characterization of the influent is needed to determine compliance with a permit condition, such as the 5-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) percent removal limitations required by the secondary treatment standards for publicly owned treatment works (POTWs).

Source water monitoring is the monitoring of source water before use as process water (e.g., river water used as contact cooling water). The permit writer should require source water monitoring if intake credits are established as specified in § 122.45(g).

Influent and source water monitoring locations should ensure a representative sample of raw intake water before any processes or treatment that could alter the properties of the intake water.

8.1.2.2 Internal monitoring locations

Internal monitoring is the monitoring of wastestreams at a location within the facility before discharge to waters of the United States. The NPDES regulations at § 122.45(h) allow internal monitoring points to be established when needed to determine compliance with a standard and in cases where setting an external monitoring location is not feasible. The permit writer may require internal monitoring to determine compliance with technology-based effluent limitations (TBELs) for a wastestream before commingling with other process or non-process wastestreams. Internal monitoring is generally not appropriate for determining compliance with water quality-based effluent limitations (WQBELs) unless final effluent monitoring is impractical (e.g., the final discharge point is submerged or inaccessible).

Examples of reasons for requiring designation of internal monitoring locations include the following:

- **Ensuring compliance with effluent guidelines (at non-POTW facilities):** When non-process wastewaters dilute process wastewaters subject to effluent guidelines, monitoring the combined discharge might not accurately allow determination of whether the facility is complying with the effluent guidelines. Under such circumstances, the permit writer might consider requiring monitoring for compliance with TBELs before the process wastewater is combined with non-process wastewater.
- **Ensuring compliance with secondary treatment standards (for POTWs only):** Some POTWs include treatment processes that do not address pollutants regulated by secondary treatment standards and that could interfere with the ability to accurately monitor for compliance with secondary treatment standards. Under such circumstances, the permit writer could consider requiring monitoring for compliance with limitations derived from secondary treatment standards before such processes. For example, the permit could require effluent monitoring for compliance with limitations derived from secondary treatment standards after secondary clarification but before disinfection.
- **Allowing detection of a pollutant:** Instances could arise where the combination of process and non-process wastewaters result in dilution of a pollutant of concern such that it would not be detectable using approved analytical methods. Internal monitoring would enable characterization of the pollutant before dilution with other wastewaters.

Where the permit writer determines that internal monitoring is necessary, § 122.45(h)(2) states that limitations on internal wastestreams may be imposed only where the permit fact sheet sets forth the exceptional circumstances requiring application of limitations at those locations.

8.1.2.3 Effluent monitoring locations

Effluent monitoring is monitoring of the final effluent after all treatment processes. The permit writer should require effluent monitoring to determine compliance with final effluent limitations established in the permit. Effluent monitoring also can be used to provide data to assess the possible impact of the discharge on the receiving water.

Effluent monitoring locations should provide a representative sample of the effluent being discharged into the receiving water. Effluent monitoring locations should be established after all industrial uses and treatment processes. Most importantly, the point where a final effluent limitation applies and the point

where monitoring is required must be the same. A logical effluent monitoring point is just before discharge to the receiving water. This is particularly true for ensuring compliance with WQBELs.

8.1.3 Monitoring Frequency

The permit writer should establish monitoring frequencies sufficient to characterize the effluent quality and to detect events of noncompliance, considering the need for data and, as appropriate, the potential cost to the permittee. Monitoring frequency should be determined on a case-by-case basis, and decisions for setting monitoring frequency should be described in the fact sheet. Some states have their own monitoring guidelines that can help a permit writer determine an appropriate monitoring frequency.

To establish a monitoring frequency, the permit writer should consider the variability of the concentration of various parameters by reviewing effluent data for the facility (e.g., from discharge monitoring reports [DMRs]) or, without actual data, information from similar dischargers. A highly variable discharge should require more frequent monitoring than a discharge that is relatively consistent over time (particularly in terms of flow and pollutant concentration). Other factors that should be considered when establishing appropriate monitoring frequencies include the following:

- **Design capacity of the treatment facility.** The monitoring frequency might need to be increased at facilities where the treatment facility is nearing design capacity. For example, at equivalent average flow rates, a large lagoon system that is not susceptible to bypasses would require less frequent monitoring than an overloaded treatment facility that experiences fluctuating flow rates from infiltration or large batch discharges from an industrial user system. The lagoon should have a relatively low variability compared to the facility receiving batch discharges.
- **Treatment method used.** The monitoring frequency will be similar for similar treatment processes. The type of wastewater treatment used by the facility might affect the frequency of effluent monitoring. An industrial facility employing biological treatment would have a similar monitoring frequency as a secondary treatment plant with the same units used for wastewater treatment. If the treatment method is appropriate and achieving high pollutant removals on a consistent basis, monitoring could be less frequent than for a plant with little or insufficient treatment.
- **Compliance history.** The monitoring frequency might need to be adjusted to reflect the compliance history of the facility. A facility with problems achieving compliance generally should be required to perform more frequent monitoring to characterize the source or cause of the problems or to detect noncompliance.
- **Cost of monitoring relative to permittee's capabilities.** The monitoring frequency should not be excessive and should be what is necessary to provide sufficient information about the discharge.
- **Location of the discharge.** The monitoring frequency could be increased if the discharge is to sensitive waters or is near a public water supply.
- **Nature of the pollutants.** To accurately characterize the discharge, the monitoring frequency might be increased for wastewaters with highly toxic pollutants or where the nature of the pollutants varies.

- **Frequency of the discharge.** The monitoring frequency for a wastewater discharged in batches infrequently should differ from that for a continuous discharge of highly concentrated wastewater or a wastewater containing a pollutant that is found infrequently and at very low concentrations. The production schedule of the facility (e.g., seasonal, daily), the plant washdown schedule, and other similar factors should be considered.
- **Number of monthly samples used in developing effluent limitations.** When establishing monitoring frequency, the permit writer should consider the number of monthly samples used in developing average monthly WQBELs. If the discharger monitors less frequently than the monthly monitoring frequency assumed when developing applicable effluent guidelines or in calculating a WQBEL, it could be more difficult for the discharger to comply with its average monthly effluent limitations. For example, if an average monthly limitation is established assuming a monitoring frequency of four times per month (i.e., the limit is the expected average of four samples taken during a month), a discharger taking only one sample per month would statistically have a greater chance of exceeding its average monthly limit than if it sampled at least four times per month.
- **Tiered limitations.** The monitoring frequency requirements should correspond to the applicable tiers in cases where the permit writer has included tiered limitations. If a facility has seasonal discharge limitations, it might be appropriate to increase the monitoring frequency during the higher production season, and reduce the frequency during the off-season.
- **Other Considerations.** To ensure representative monitoring, permit conditions could be included to require monitoring on the same day, week, or month for parameters that might be correlated in some way. For example, coordinating the monitoring requirements for parameters such as pathogens and chlorine or metals and pH can provide information for both compliance assessment and determination of treatment efficacy.

A permit writer could also establish a tiered monitoring schedule that reduces or increases the monitoring frequency during a permit cycle. Tiered monitoring might be appropriate for discharges where the initial sampling shows compliance with effluent limitations, justifying a reduction in monitoring frequency over time. Conversely, if problems are found during the initial sampling, more frequent sampling and more comprehensive monitoring can be applied. This step-wise approach could lead to lower monitoring costs for permittees while still providing the data needed to demonstrate compliance with effluent limitations.

In 1996 EPA issued *Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies* <www.epa.gov/npdes/pubs/perf-red.pdf>. Under the guidance, NPDES reporting and monitoring requirements may be reduced on the basis of a demonstration of excellent historical performance. Facilities can demonstrate that historical performance by meeting a set of compliance and enforcement criteria and by demonstrating their ability to consistently discharge pollutants below the levels necessary to meet their existing NPDES permit limitations. Reductions are determined parameter-by-parameter, on the basis of the existing monitoring frequency and the percentage below the limitation at which the parameter is being discharged. The reductions are incorporated when the permit is reissued. To remain eligible for the reductions, permittees are expected to maintain the parameter performance levels and good compliance on which the reductions were based.

8.1.4 Sample Collection

The permit writer must specify the sample collection method for all parameters required to be monitored in the permit. The permit writer should determine the sample collection method on the basis of the characteristics of each specific discharge. Certain sample collection and storage requirements are identified as part of the analytical methods specified in Part 136. (Section 8.3 below presents more on analytical methods.) The two most frequently used sampling methods are grab and composite. For more detailed information on sample collection methods, permit writers should refer to Chapter 5 (Sampling) of the NPDES Compliance Inspection Manual[1] <www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesmanual.html>.

8.1.4.1 Grab Samples

Grab samples are individual samples collected over a period not exceeding 15 minutes and that are representative of conditions at the time the sample is collected. Grab samples are appropriate when the flow and characteristics of the wastestream being sampled are relatively constant. The sample volume depends on the type and number of analyses to be performed. A grab sample is appropriate when a sample is needed to

- Monitor an effluent that does not discharge on a continuous basis.
- Provide information about instantaneous concentrations of pollutants at a specific time.
- Allow collection of a variable sample volume.
- Corroborate composite samples.
- Monitor parameters not amenable to compositing (e.g., temperature).

Grab samples can also be used to determine the spatial variability of a parameter or information on variability over a short period. They also are useful for monitoring intermittent wastewater flows from well-mixed batch process tanks.

8.1.4.2 Composite Samples

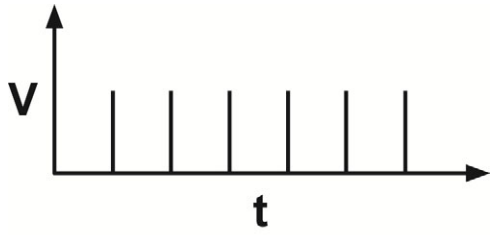
Composite samples are collected over time, either by continuous sampling or by mixing discrete samples, and represent the average characteristics of the wastestream during the sample period. Composite samples might provide a more representative measure of the discharge of pollutants over a given period than grab samples, and are used when any of the following is true:

- A measure of the average pollutant concentration during the compositing period is needed.
- A measure of mass loadings per unit of time is needed.
- Wastewater characteristics are highly variable.

Composite samples can be discrete samples (see discussion of sequential sampling in section 8.1.4.3 below) or a single combined sample and are collected either manually or with automatic samplers. There are two general types of composite sampling: time-proportional and flow-proportional. The permit writer should clearly express which type is required in the permit.

Time-proportional composite sample: This method collects a fixed volume (V) of discrete sample aliquots in one container at constant time intervals (t) as shown in Exhibit 8-2.

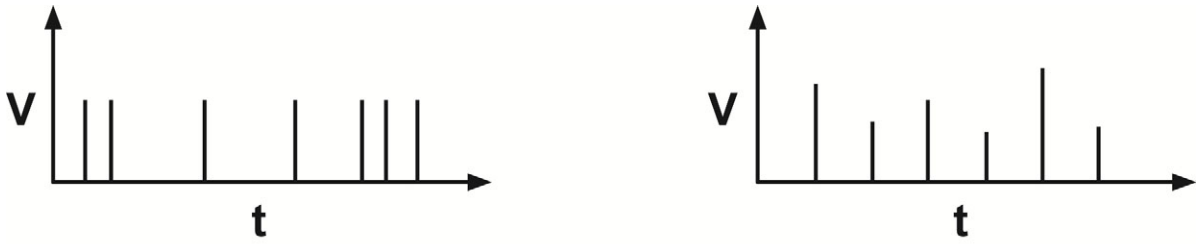
Exhibit 8-2 Visual interpretation of time-proportional composite monitoring



Time-proportional composite monitoring is appropriate when the flow of the sampled stream is constant (flow rate does not vary more than ±10 percent of the average flow rate) or when flow-monitoring equipment is not available. Automatically timed composited samples are usually preferred over manually collected composites. Composite samples collected by hand are appropriate for infrequent analyses and screening or if the subsamples have a fixed volume at equal time intervals.

Flow-proportional composite sample: There are two methods used for this type of sample: constant-volume when the interval time varies between samples, or constant-time when the interval volume collected varies between samples as shown in Exhibit 8-3.

Exhibit 8-3 Visual interpretation of flow-proportional composite monitoring



The constant-volume, flow-proportional, composite monitoring method collects a constant sample volume at varying time intervals proportional to stream flow (e.g., 200 milliliters sample collected for every 5,000 gallons of flow). The constant-time, flow-proportional, composite monitoring method collects the sample by adjusting the volume of each aliquot as the flow varies, while maintaining a constant time interval between the aliquots.

Flow-proportional composite sampling is usually preferred over time-proportional composite sampling when the effluent flow volume varies appreciably over time. If there is no flow-measuring device, effluent samples can be manually composited using the influent flow measurement without any correction for time lag. The error in the influent and effluent flow measurement is insignificant except in those cases where large volumes of water are impounded, as in equalization basins.

If a sampling protocol is not specified in the regulations, the permit writer should establish the duration of the compositing period and frequency of aliquot collection. The permit writer should also establish the time frame within which the sample is to be collected and the number of individual aliquots in the composite.

There are instances where composite samples are inappropriate. For example, the permit application regulations at § 122.21(g)(7) indicate that grab samples must be used for sampling several parameters that may change during the time it takes to composite the sample. Composite samples can be used for whole effluent toxicity (WET) testing; however, if there is concern that there are toxicity spikes or that the toxicant is a parameter for which composite sampling is not appropriate, grab samples for WET testing could be specified in the permit.

8.1.4.3 Sequential and Continuous Monitoring

Sequential monitoring refers to collecting discrete samples in individual containers in regular succession, such as timed intervals or discharge increments. Sequential grab samples provide a characteristic of the wastestream over a given time. Automatic sequential monitoring may be done with a special type of automatic sampling device that collects relatively small amounts of a sampled wastestream with the interval between sampling proportioned based on either time or effluent flow. Unlike a combined composite sampler, the sequential sampling device automatically retrieves a sample and holds it in a bottle separate from other automatically retrieved samples. Many individual samples can be stored separately in the unit rather than combining aliquots in a common bottle.

Continuous monitoring is another option for a limited number of parameters such as flow, total organic carbon (TOC), temperature, pH, conductivity, residual chlorine, fluoride, and dissolved oxygen. When establishing continuous monitoring requirements, the permit writer should be aware that the NPDES regulations concerning pH limitations allow for a period of excursion when the effluent is being continuously monitored (§ 401.17). The reliability, accuracy, and cost of continuous monitoring vary with the parameter monitored. The permit writer should consider the environmental significance of the variation of any of these parameters in the effluent and the cost of continuous monitoring before establishing continuous monitoring requirements in the permit.

8.2 Additional Monitoring Requirements and WET Testing

A variety of discharges other than traditional POTW or industrial wastewater discharges, including biosolids (sewage sludge), combined sewer and sanitary sewer overflows, and stormwater, are regulated under the NPDES permit program. In addition, many permits include requirements for WET testing. As discussed in this section, a permit writer should account for such unique discharges and testing requirements in establishing monitoring requirements.

8.2.1 Biosolids (Sewage Sludge)

The purpose of monitoring sewage sludge is to ensure safe use or disposal of the sludge. Sewage sludge regulations specified in Part 503 require monitoring of sewage sludge that is applied to land, placed on a surface disposal site, or incinerated. The frequency of monitoring is based on the annual amount of sewage sludge that is used or disposed of by those methods. POTWs that provide the sewage sludge to another party for further treatment (such as composting) must provide that party with the information necessary to comply with regulations at Part 503. Sewage sludge disposed of in a municipal solid waste landfill unit must meet the criteria for municipal solid waste landfills in the regulations at Part 258.

Exhibit 8-4 shows the minimum monitoring requirements established in Part 503 for sewage sludge before use and disposal. More frequent monitoring for any of the required or recommended parameters is appropriate when the POTW has any of the following:

- A highly variable influent load of toxics or organic solids.
- A significant industrial load.
- A history of process upsets due to toxics, or of adverse environmental impacts due to sludge use or disposal activities.

Exhibit 8-4 Minimum requirements for sewage sludge monitoring, based on method of sludge use or disposal

Method	Monitoring requirements	Frequency	Citation (40 CFR)
Land application	• Sludge weight and percent total solids • Metals: As, Cd, Cu, Pb, Hg, Mo, Ni, Se, and Zn • Pathogen Density • Vector Attraction Reduction	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.16
Co-disposal in municipal solid waste landfill	• Sludge weight and percent total solids • Passes Paint-Filter Liquid Test • Suitability of sludge used as cover • Characterize in accordance with hazardous waste rules	Monitoring requirements or frequency not specified by Part 503. Determined by local health authority or landfill owner/operator.	Part 258
Surface disposal: lined sites with leachate collection and unlined sites	• Sludge weight and percent total solids • Metals: As, Cr, Ni (Unlined sites only) • Pathogen Density • Vector Attraction Reduction	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.26
	• Methane gas	• Continuously	
Incineration	• Sludge weight and percent total solids • Metals: As, Cd, Cr, Pb, and Ni	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.46
	• Be and Hg (National Emissions Standards)	• As required by permitting authority (local air authority)	
	• THC or O_2, moisture, combustion temperatures	• Continuously	
	• Air pollution control device operating parameters	• As required by permitting authority	

Notes:
Monitoring frequencies required by Part 503 may be reduced after 2 years of monitoring, but in no case may be less than once per year.
A successful land application program could necessitate sampling for other constituents of concern (such as nitrogen) in determining appropriate agronomic rates. The permit writer will determine additional monitoring requirements.

The sampling and analysis methods specified in § 503.8 and Part 136 should be followed for monitoring the required parameters. Without any specific methods in Part 503, guidance on appropriate methods is in the following documents:

- *Part 503 Implementation Guidance*[2] <www.epa.gov/npdes/pubs/owm0237.pdf>.
- *POTW Sludge Sampling and Analysis Guidance Document*[3] <www.epa.gov/npdes/pubs/owm012.pdf>.
- *Control of Pathogens and Vector Attraction in Sewage Sludge*[4] <www.epa.gov/ORD/NRMRL/pubs/625r92013/625r92013.htm>.

8.2.2 Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs)

EPA's Combined Sewer Overflow (CSO) Control Policy (59 FR 18688, April 19, 1994) requires monitoring to characterize the combined sewer system, assist in developing a Long-Term Control Plan (LTCP), and show compliance with permit requirements. The permit writer should ensure the following:

- Monitoring is done to develop an initial system characterization as part of the nine minimum controls to reduce CSOs and their effect on receiving water quality. Such monitoring includes analyzing existing data on precipitation events, on the combined sewer system and CSOs, on water quality, and conducting field inspections.
- As part of the LTCP, a permittee is required to develop a more complete characterization of the sewer system through monitoring and modeling.
- To show compliance with the permit requirements and ultimately the attainment of water quality standards, the permittee is required to conduct a post-construction compliance monitoring program. Specific monitoring requirements of the post-construction compliance monitoring program will be unique to each permittee's LTCP and should be established as specific monitoring conditions in the individual NPDES permit.

These monitoring conditions should require monitoring of certain key parameters during a representative number of CSOs from a representative number of wet-weather events along with ambient water quality monitoring to ascertain attainment of water quality standards. EPA has prepared a guidance manual on monitoring entitled *Combined Sewer Overflows: Guidance for Monitoring and Modeling*[5] <www.epa.gov/npdes/pubs/sewer.pdf>.

A facility's permit might also contain monitoring requirements for sanitary sewer overflows (SSOs). SSO monitoring requirements would be developed on a case-by-case basis.

8.2.3 Stormwater Monitoring Considerations

Stormwater monitoring requirements vary according to the type of permit regulating the stormwater discharge and the activity. Municipal separate storm sewer systems (MS4s) serving more than 100,000 people (and some serving less than 100,000) are typically issued individual NPDES permits with monitoring requirements that are specific to the MS4. Smaller MS4s regulated under the stormwater Phase II rule are typically not required to conduct water quality monitoring as a condition in their NPDES general permit, though evaluation of measurable goals may include monitoring. EPA's multi-sector general permit (MSGP) for stormwater discharges from industrial facilities includes analytical monitoring requirements based on the type of industrial activity. Finally, operators of construction activity regulated under the

construction general permit are typically not required to conduct water quality monitoring; however, some states and EPA Regions do require monitoring if the construction activity will discharge to a water impaired by sediment.

Specific monitoring conditions for the federal general stormwater permits are detailed in the most recent Construction General Permit or MSGP issued by EPA (available on the EPA Stormwater Program Website <www.epa.gov/npdes/stormwater>). Additional documents on stormwater monitoring are:

- *Urban Stormwater BMP Performance: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements*[6] <www.epa.gov/npdes/pubs/montcomplete.pdf>.
- *Guidance Manual for the Monitoring and Reporting Requirements of the NPDES Stormwater Multi-Sector General Permit (MSGP)*[7] <www.epa.gov/npdes/pubs/dmr-fin.pdf>.

8.2.4 WET Monitoring

The use of WET testing to evaluate the toxicity in a receiving stream is discussed in section 6.4 of this manual and on the NPDES WET Website <www.epa.gov/npdes/wet>. The WET (or biomonitoring) test procedures were promulgated in § 136.3 (60 FR 53529, October 16, 1995). EPA revised the WET methods in 67 FR 69951, November 19, 2002. WET monitoring conditions included in permits should specify the particular biomonitoring test to be used, the test species, required test endpoints, and quality assurance/quality control procedures.

To support permitting agencies in implementing WET methods, EPA has revised and published manuals for toxicity test protocols:

- *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*. 5th ed.[8] <www.epa.gov/waterscience/WET/disk2/atx.pdf>.
- *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. 4th ed.[9] <www.epa.gov/waterscience/WET/disk3/ctf.pdf>.
- *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*. 3rd ed.[10] <www.epa.gov/waterscience/WET/disk1/ctm.pdf>.
- *NPDES Compliance Monitoring Inspector Training: Biomonitoring*[11] (No Link).

WET testing samples could be composite or grab samples. Twenty-four hour composite samples are suggested except when any of the following are true:

- The effluent is expected to be more toxic at a certain time of day.
- Toxicity may be diluted during compositing.
- The size of the sample needed exceeds the composite sampler volume.

WET tests are relatively expensive compared to single parameter tests. Therefore, a permit writer should carefully consider the appropriate frequency for WET testing. A discharge with highly variable flow or observed toxicity should have more frequent monitoring than a discharge that is relatively consistent over time. As with other parameters, factors that a permit writer should consider when establishing appropriate WET monitoring frequencies include the following:

- Type of treatment process.

- Environmental significance and nature of the toxicity.
- Past compliance record or history.
- Cost of monitoring relative to financial capabilities.
- Number of monthly samples used in developing the permit limitation.
- The frequency of intermittent discharges.

Samples should be evenly spaced throughout the year so that seasonal variability can be ascertained.

8.3 Analytical Methods

The permit writer must specify the analytical methods to be used for monitoring. EPA's Office of Science and Technology's Clean Water Act Analytical Methods Website <www.epa.gov/waterscience/methods/> contains information about analytical methods.

The standard conditions of the permit [§§ 122.41(j)(4) and 122.44(i)] require that, when available, permittees use test procedures specified in Part 136 <www.epa.gov/waterscience/methods/basic.htm>. The analytical methods contained in Part 136 are established for conventional, toxic (priority), and some nonconventional pollutants. Without analytical methods for a parameter, the permit writer should specify the analytical method to be used. There are also procedures to apply for approval of alternative test methods in accordance with § 136.4.

While Part 136 identifies the analytical methods approved for use in the NPDES program, additional methods information is available through the National Environmental Methods Index (NEMI) <www.nemi.gov/>. NEMI is a Web-based, searchable clearinghouse of methods supported by the U.S. Geological Survey and EPA's Office of Water. NEMI contains summaries of more than 1,100 methods and describes them by their performance characteristics and their regulatory status, relative cost, detection level, detection level type, accuracy, precision, spiking level, instrumentation, lab equipment, and the *greenness* of analytic methods. Permit writers might find that information useful in comparing the features of Part 136 methods that will be used for assessing compliance with the calculated effluent limitations.

When establishing effluent limitations for a specific parameter (based on technology or water quality regulatory requirements), it is possible for the value of the calculated limit to fall below the method detection limit (MDL) and the minimum level (ML) established by the approved analytical method(s). Regardless of whether current analytical methods are available to detect and quantify the parameter at the concentration of the calculated limitation, the limitation must be included in the permit as calculated.

In some instances, there might be two or more approved Part 136 analytical methods available for the analysis of a parameter. In such cases, the permit should determine whether there is a need to select one of the approved methods and to include a requirement in the permit mandating the use of only the selected method. That approach might be necessary where an effluent limit is established at a level that is quantifiable by one approved method but is below the ML of another approved method.

Such a situation often occurs where a permit contains a WQBEL for mercury. To clarify the EPA's position with respect to effluent monitoring for mercury, EPA developed a memo *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits*[12] <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

***Sufficiently Sensitive* Methods**

At the time of the writing of this manual, EPA had proposed regulations at §§ 122.21(e), 122.44(i), and Part 136, to require the use of sufficiently sensitive methods for analyses conducted for NPDES permit applications and for compliance monitoring (75 FR 35712, June 23, 2010). To ensure that appropriate analytical methods are required and performed, see the most current version of these federal regulations and applicable state analytical method regulations and policy.

8.4 Reporting Monitoring Results

The NPDES regulations require the permittee to maintain records and periodically report on monitoring activities. The regulations at § 122.41(l)(4)(i) require that monitoring results must be reported on a DMR <www.epa.gov/npdes/pubs/dmr.pdf>. Data reported include both data required by the permit and any additional data the permittee has collected consistent with permit requirements. All facilities must submit reports (on discharges and sludge use or disposal) at least annually, as required by § 122.44(i)(2). POTWs with pretreatment programs must submit a pretreatment report at least annually as required by § 403.12(i). However, the NPDES regulation states that monitoring frequency and reporting should be dependent on the nature and effect of the discharge or sludge use or disposal. Thus, the permit writer can require reporting more frequent than annually.

8.5 Recordkeeping Requirements

Generally, the permit writer is required by § 122.41(j) to include in the permit the requirement to retain records for at least three years, subject to extension by the State Director. Recordkeeping requirements for sewage sludge [§ 122.41(j)] and the CAFO program [§ 122.42(e)(2)] require records be kept five years or longer if required by the State Director. The permit writer should designate in the permit where records should be kept.

Monitoring records must include the following:

- Date, place, time of sampling.
- Name of sampler.
- Date of analysis.
- Name of analyst.
- Analytical methods used.
- Analytical results.

According to § 122.41(j), monitoring records must be representative of the discharge. Monitoring records, which must be retained, include continuous strip chart recordings, calibration data, copies of all reports for the permit, and copies of all data used to compile reports and applications.

Sewage sludge regulations under §§ 503.17, 503.27, and 503.47 establish recordkeeping requirements that vary depending on the use and disposal method for the sewage sludge. The same recordkeeping requirements should be applied to other sludge monitoring parameters not regulated by the Part 503 rule.

[1] U.S. Environmental Protection Agency. 2004. *NPDES Compliance Inspection Manual*. EPA-305-X-03-001. U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance, Washington, DC. <www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesinspect.pdf>.

[2] U.S. Environmental Protection Agency. 1995. *Part 503 Implementation Guidance*. EPA 833-R-95-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0237.pdf>.

[3] U.S. Environmental Protection Agency. 1989. *POTW Sludge Sampling and Analysis Guidance Document*. EPA-833-B-89-100. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm012.pdf>.

[4] U.S. Environmental Protection Agency. 1992. *Control of Pathogens and Vector Attraction in Sewage Sludge*. EPA-625/R-92-013. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC. <www.epa.gov/ORD/NRMRL/pubs/625r92013/625r92013.htm>.

[5] U.S. Environmental Protection Agency. 1999. *Combined Sewer Overflows–Guidance for Monitoring and Modeling*. EPA-832-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/sewer.pdf>.

[6] U.S. Environmental Protection Agency. 2002. *Urban Stormwater BMP Performance: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements*. EPA-821-B-02-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/montcomplete.pdf>.

[7] U.S. Environmental Protection Agency. 1999. *Guidance Manual for the Monitoring and Reporting Requirements of the NPDES Stormwater Multi-Sector General Permit (MSGP).* U.S. Environmental Protection Agency, Office of Water, NPDES Program Branch, Washington, DC. <www.epa.gov/npdes/pubs/dmr-fin.pdf>.

[8] U.S. Environmental Protection Agency. 2002. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition.* EPA-821-R-02-012. U.S. Environmental Protection Agency, Office of Water, Washington, DC <www.epa.gov/waterscience/WET/disk2/atx.pdf>.

[9] U.S. Environmental Protection Agency. 2002. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*. EPA-821-R-02-013. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/WET/disk3/ctf.pdf>.

[10] U.S. Environmental Protection Agency. 1994. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition*. EPA821-R-02-014. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/WET/disk1/ctm.pdf>.

[11] U.S. Environmental Protection Agency. 1990. *NPDES Compliance Monitoring Inspector Training: Biomonitoring*. U.S. Environmental Protection Agency, Office of Water Enforcement and Permits, Washington, DC. NTIS # PB91-145854. (No Link)

[12] Hanlon, James A. 2007. *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, August 23, 2007. <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

CHAPTER 9. Special Conditions

Special conditions in National Pollutant Discharge Elimination System (NPDES) permits supplement numeric effluent limitations and require the permittee to undertake activities designed to reduce the overall quantity of pollutants being discharged to waters of the United States, to reduce the potential for discharges of pollutants, or to collect information that could be used in determining future permit requirements.

There are many different reasons to incorporate special conditions into a permit including:

- To address unique situations, such as facilities discharging pollutants for which data are absent or limited, making development of technology- or water quality-based effluent limitations (TBELs or WQBELs) more difficult or impossible.
- To incorporate preventive requirements, such as requirements to install process control alarms, containment structures, good housekeeping practices, and the like.
- To address foreseeable changes to discharges, such as planned changes to process, products, or raw materials that could affect discharge characteristics.
- To incorporate compliance schedules to provide the time necessary to comply with permit conditions.
- To incorporate other NPDES programmatic requirements (e.g., pretreatment, sewage sludge).
- To impose additional monitoring requirements that provide the permit writer with data to evaluate the need for changes in permit limitations.
- To increase or decrease monitoring requirements, depending on monitoring results or changes in processes or products.
- To impose requirements for special studies such as ambient stream surveys, toxicity identification evaluations (TIEs) and toxicity reduction evaluations (TREs), bioaccumulation studies, sediment studies, mixing or mixing zone studies, pollutant reduction evaluations, or other such information-gathering studies.

Section 9.1 below addresses several types of special conditions that apply to both municipal and non-municipal facilities. Section 9.2 addresses special conditions unique to municipal facilities.

9.1 Special Conditions Potentially Applicable to Any Type of Discharger

This section discusses several types of special conditions that could be included in any NPDES permit (i.e., municipal or non-municipal). Those special conditions can be thought of as the *ABCs* of special conditions and include the following:

- **A**dditional monitoring and special studies.
- **B**est management practices (BMPs).
- **C**ompliance schedules.

A summary of the use of those special conditions follows.

9.1.1 Additional Monitoring and Special Studies

Additional monitoring requirements, beyond those required under the effluent limitations section of the permit, and special studies are useful for collecting data that were not available to the permit writer for consideration during permit development. Additional monitoring requirements and special studies generally are used to supplement numeric effluent limitations or support future permit development activities. Examples of the types of special studies that could be required in an NPDES permit include the following:

- **Treatability studies:** Might be required in a permit when insufficient treatability information for a pollutant or pollutants would hinder a permit writer from developing defensible TBELs. Treatability studies can also be required when the permit writer suspects that a facility might not be able to comply with an effluent limitation.
- **Toxicity identification evaluation/toxicity reduction evaluation (TIE/TRE):** Could be required in a permit when wastewater discharges are found to be toxic using whole effluent toxicity (WET) tests. The purpose of those evaluations is to identify and control the sources of toxicity in an effluent. Further guidance related to U.S. Environmental Protection Agency (EPA) recommended TIE/TRE procedures and requirements is found in the following guidance manuals:
  - *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*[1] <www.epa.gov/npdes/pubs/tre.pdf>.
  - *Clarifications Regarding Toxicity Reduction and Identification Evaluations in the National Pollutant Discharge Elimination System Program*[2] <www.epa.gov/npdes/pubs/owmfinaltretie.pdf>.
  - *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations*[3] (No link—see the endnote for ordering instructions).
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures*. 2nd ed[4] <www.epa.gov/npdes/pubs/owm0330.pdf>.
  - *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*[5] <www.epa.gov/npdes/pubs/owm0255.pdf>.
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity*[6] <www.epa.gov/npdes/pubs/owm0343.pdf>.
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase III Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*[7] <www.epa.gov/npdes/pubs/owm0341.pdf>.
- **Mixing or mixing zone studies:** Might be required in a permit to assist in determining how effluent and receiving water mix and in establishing a regulatory mixing zone that can be applied when developing WQBELs.
- **Sediment monitoring:** Could be included in a permit if a permit writer suspects that pollutants contained in wastewater discharges accumulate in the sediments of the receiving water.
- **Bioaccumulation studies:** Might be required in a permit to determine whether pollutants contained in wastewater discharges bioaccumulate in aquatic organisms (e.g., fish, invertebrates). Such studies could be required when water quality criteria are expressed in terms of fish tissue levels. Additional guidance related to evaluating the bioaccumulation potential of a pollutant can

be found in the *EPA Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors*[8] (No link—see the endnote for ordering instructions).

When establishing additional monitoring or special studies, permit writers must ensure that any requirements related to the study (e.g., special sampling or analytical procedures) are specified in the appropriate permit condition. In addition, permit writers should establish a reasonable schedule for completion and submission of the study or monitoring program. If the anticipated timeline is longer than one year, an interim progress report during the study is advisable.

9.1.2 Best Management Practices (BMPs)

In general, BMPs are actions or procedures to prevent or reduce the discharge of pollution to waters of the United States. Title 40 of the *Code of Federal Regulations* (CFR) section 122.2 includes the following in the definition of BMPs:

- Schedules of activities.
- Prohibitions of practices.
- Maintenance procedures.
- Treatment requirements.
- Operating procedures and practices to control
  - Plant site runoff.
  - Spillage or leaks.
  - Sludge or waste disposal.
  - Drainage from raw material storage areas.

9.1.2.1 When to Use BMPs

Clean Water Act (CWA) section 304(e) authorizes EPA to require BMPs as part of effluent limitations guidelines and standards (effluent guidelines) to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage that it determines are associated with or ancillary to the industrial manufacturing or treatment process and can contribute significant amounts of pollutants to navigable waters. Where effluent guidelines require specific control measures, including BMPs or development of a BMP plan, permit writers must include such requirements in permits. In addition, CWA section 402(p)(3)(B)(iii) states that permits for discharges from municipal storm sewers must require controls, including management practices, to reduce the discharge of pollutants. Finally, CWA sections 402(a)(1) and (2) give the permitting authority the ability to include BMPs in permits on a case-by-case basis to carry out the provisions of the CWA.

The NPDES regulations at § 122.44(k) track the statutory provisions cited above. This section of the regulations provides that permits must contain BMPs (when applicable) to control or abate the discharge of pollutants when any of the following are true:

- They are authorized under CWA section 304(e).
- They are authorized under CWA section 402(p) for the control of stormwater discharges.
- Numeric effluent limitations are infeasible.
- The practices are necessary to achieve effluent limitations and standards or carry out the purpose and intent of the CWA.

Circumstances under which numeric effluent limitations might be infeasible include the following:

- Regulating a pollutant for which limited treatability or aquatic impact data are available to allow development of numeric TBELs or WQBELs.
- Regulating discharges when the types of pollutants vary greatly over time.

In addition, a permit writer should consider using BMPs under any of the following circumstances:

- When chemical analyses are inappropriate or impossible.
- When there is a history of leaks and spills or when housekeeping is sloppy.
- When a complex facility lacks data for a pollutant or pollutants.

9.1.2.2 BMPs in NPDES Permits

Permit writers include BMP requirements in permits using two approaches: (1) site-, process-, or pollutant-specific BMPs, or (2) a requirement to develop a BMP plan. Site-, process-, or pollutant-specific BMPs might be appropriate in the case of an individual permit where a permit writer has the opportunity to review the circumstances at the facility. On the other hand, it might not be appropriate to include site-, process-, or pollutant-specific BMPs as conditions in a general permit, a permit for a particularly complex facility, or a permit for a facility with operations not familiar to the permit writer. Instead, complicated facilities and discharges covered under a general permit could be required to develop a BMP plan that requires the permittee to determine appropriate BMPs on the basis of circumstances at its facility.

Specific BMPs

Specific BMPs are designed to address conditions particular to a type of facility or to a specific site, process, or pollutant. Specific BMPs might be used in a permit when

- They are needed to address ancillary activities that could result in the discharge of pollutants to waters of the United States.
- Numeric effluent limitations for a specific process are otherwise infeasible and BMPs serve as effluent limitations for that process.
- They are required to supplement and ensure compliance with effluent limitations in the permit.

To select a specific BMP, the permit writer could

- Review the industry profiles or the specific facility to determine the applicable and appropriate management practices.
- Evaluate whether the BMP would help to achieve effluent limitations or other environmental objectives for that facility.
- Use information from other permits, pollution prevention sources, and EPA guidance documents to identify applicable and appropriate BMPs.

Specific BMPs frequently are required for certain types of dischargers such as concentrated animal feeding operations (CAFOs), combined sewer overflows (CSOs), and stormwater discharges.

BMP Plans

The *Guidance Manual for Developing Best Management Practices*[9] <www.epa.gov/npdes/pubs/owm0274.pdf> describes the activities and materials at an industrial or municipal facility that are best addressed by BMPs. The manual also describes how BMPs work and gives examples of types of BMPs.

If a permit writer requires a BMP plan, it is the facility's responsibility to develop, implement, and evaluate the success or shortfalls of its own plan. Often, a BMP committee (i.e., a group of individuals within the plant organization) is responsible for developing the BMP plan and assisting the plant management in implementing and updating the BMP plan.

EPA has identified several recommended components of effective BMP plans and detailed each component in the *Guidance Manual for Developing Best Management Practices*. The minimum suggested components of a general BMP plan are presented below:

- General Provisions
  - Name and location of facility.
  - Statement of BMP policy and objective.
  - Review by plant manager.
- Specific Provisions
  - BMP committee.
  - Risk identification and assessment.
  - Reporting of BMP incidents.
  - Materials compatibility.
  - Good housekeeping.
  - Preventive maintenance.
  - Inspections and records.
  - Security.
  - Employee training.

BMP plans used to supplement effluent limitations or to describe how the discharger plans to meet effluent limitations can be submitted to the regulatory agency or be kept on-site and made available to the permitting authority upon request. A general schedule for BMP plan development can be included in the permit (e.g., complete and submit the plan within six months of permit issuance and begin implementing the plan within nine months of permit issuance).

Exhibit 9-1 presents example permit text for a requirement to develop and implement a BMP plan and should be adapted as necessary to reflect conditions at the individual facility.

Exhibit 9-1 Example BMP plan requirement

The following is example text for requiring development and implementation of a BMP plan through an NPDES permit. The text should be crafted and changed as necessary to meet the individual facility's needs and the permitting authority's goals. The bracketed text should be updated to be specific to the permit.

1. Implementation.

[IF A BMP PLAN DOES NOT EXIST:]

The permittee, must develop and implement a best management practices (BMP) plan that achieves the objectives and the specific requirements listed below. A copy of the plan must be submitted to the U.S. Environmental Protection Agency (EPA) **[AND/OR STATE AGENCY]** within six months of the effective date of this permit. The plan must be implemented as soon as possible but no later than nine months from the effective date of the permit. The permittee must update and amend the plan as needed.

[IF A BMP PLAN ALREADY EXISTS:]

The permittee must during the term of this permit operate the facility in accordance with the BMP plan **[CITE EXISTING PLAN]** and in accordance with subsequent amendments to the plan. The permittee must amend the plan to incorporate practices to achieve the objectives and specific requirements listed below, and a copy of the amended plan must be submitted to the U.S. Environmental Protection Agency (EPA) **[AND/OR STATE AGENCY]** within three months of the effective date of this permit. The amended plan must be implemented as soon as possible but not later than six months from the effective date of the permit.

2. Purpose

Through implementation of the BMP plan the permittee must prevent or minimize the generation and the potential for the release of pollutants from the facility to the waters of the United States through normal operations and ancillary activities.

3. Objectives

The permittee must develop and amend the BMP plan consistent with the following objectives for the control of pollutants.

a. The number and quantity of pollutants and the toxicity of effluent generated, discharged, or potentially discharged at the facility must be minimized by the permittee to the extent feasible by managing each influent waste stream in the most appropriate manner.
b. Under the BMP plan, and any Standard Operating Procedures (SOPs) included in the plan, the permittee must ensure proper operation and maintenance of the treatment facility as required by § 122.41(e).
c. The permittee must establish specific objectives for the control of pollutants by conducting the following evaluations.
    1. Each facility component or system must be examined for its waste minimization opportunities and its potential for causing a release of significant amounts of pollutants to waters of the United States because of equipment failure, improper operation, and natural phenomena such as rain or snowfall, etc. The examination must include all normal operations and ancillary activities including material storage areas, plant site runoff, in-plant transfer, process and material handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage. **[NOTE THAT ONLY THE APPLICABLE AREAS SHOULD BE INCLUDED IN THE PREVIOUS LIST.]**
    2. Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g., precipitation), or other circumstances that may result in significant amounts of pollutants reaching surface waters, the program should include a prediction of the direction, rate of flow and total quantity of pollutants that could be discharged from the facility as a result of each condition or circumstance.

4. Requirements

The BMP Plan must be consistent with the objectives in the Objectives section above and the general guidance contained in the publication entitled *Guidance Manual for Developing Best Management Practices (BMPs)*, EPA 833-B-93-004, <www.epa.gov/npdes/pubs/owm0274.pdf> or any subsequent revisions to the guidance document. The BMP plan must

a. Be documented in narrative form, must include any necessary plot plans, drawings or maps, and must be developed in accordance with good engineering practices. The BMP plan must be organized and written with the following structure:
    1. Name and location of the facility.
    2. Statement of BMP policy.
    3. Structure, functions, and procedures of the BMP Committee.
    4. Specific management practices and standard operating procedures to achieve the above objectives, including the following:

Exhibit 9-1 Example BMP plan requirement (continued)

a. Modification of equipment, facilities, technology, processes, and procedures.
b. Reformulation or redesign of products.
c. Substitution of materials.
d. Improvement in management, inventory control, materials handling or general operational phases of the facility.

5. Risk identification and assessment.
6. Reporting of BMP incidents.
7. Materials compatibility.
8. Good housekeeping.
9. Preventative maintenance.
10. Inspections and records.
11. Security.
12. Employee training.

b. Include the following provisions concerning BMP plan review:
   1. Review by plant engineering staff and the plant manager.
   2. Review and endorsement by the permittee's BMP Committee.
   3. A statement that the above reviews have been completed and that the BMP plan fulfills the requirements set forth in this permit. The statement must include the dated signatures of each BMP Committee member as certification of the reviews.

c. Establish specific BMPs to meet the objectives identified in the Objectives section above, addressing each component or system capable of generating or causing a release of significant amounts of pollutants, and identifying specific preventive or remedial measures to be implemented.

d. Establish specific BMPs or other measures that ensure that the following specific requirements are met:
   1. Ensure proper management of solid and hazardous waste in accordance with regulations promulgated under the Resource Conservation and Recovery Act (RCRA). Management practices required under RCRA regulations must be referenced in the BMP plan.
   2. Reflect requirements for Spill Prevention, Control, and Countermeasure (SPCC) plans under Clean Water Act (CWA) section 311 and 40 CFR Part 112 and may incorporate any part of such plans into the BMP plan by reference.
   3. Reflect requirements for stormwater control under CWA section 402(p) and the regulations at 40 CFR 122.26 and 122.44, and otherwise eliminate to the extent practicable, contamination of stormwater runoff.

   etc.

[NOTE: SECTION d. ABOVE COULD BE TAILORED TO EACH FACILITY BY THE PERMIT WRITER AND MAY INCLUDE PROCESSES OR AREAS OF THE FACILITY WITH HOUSEKEEPING PROBLEMS, NONCOMPLIANCE, SPILLS/LEAKS, OR OTHER PROBLEMS THAT COULD BE REMEDIED THROUGH A BMP. IF THERE IS A KNOWN SOLUTION TO THE PROBLEM (E.G., MORE FREQUENT INSPECTIONS, PREVENTIVE MAINTENANCE, ETC.), THIS REMEDY COULD ALSO BE INCLUDED AS A PART OF THE BMP PLAN REQUIREMENTS. TO GATHER IDEAS FOR SUCH REQUIREMENTS, THE PERMIT WRITER MAY WANT TO CONTACT THE PERMITTEE, COMPLIANCE PERSONNEL, FACILITY INSPECTORS, OPERATIONS OFFICE PERSONNEL, AND STATE AGENCY COUNTERPARTS. THE PERMIT WRITER MIGHT ALSO WANT TO CHECK REQUIREMENTS IN OTHER PERMITS AND BMP PLANS FOR SIMILAR FACILITIES.]

5. Documentation

The permittee must maintain a copy of the BMP plan at the facility and must make the plan available to EPA **[AND/OR STATE AGENCY]** upon request. All offices of the permittee, which are required to maintain a copy of the NPDES permit, must also maintain a copy of the BMP plan.

6. BMP Plan Modification

The permittee must amend the BMP plan whenever there is a change in the facility, or in the operation of the facility, that materially increases the generation of pollutants or their release or potential release to the receiving waters. The permittee must also amend the plan, as appropriate, when plant operations covered by the BMP plan change. Any such changes to the BMP plan must be consistent with the objectives and specific requirements listed above. All changes in the BMP plan must be reported to EPA **[AND/OR STATE AGENCY]** in writing.

7. Modification for Ineffectiveness

If at any time the BMP plan proves to be ineffective in achieving the general objective of preventing and minimizing the generation of pollutants and their release and potential release to the receiving waters and/or the specific requirements above, the permit and/or the BMP plan must be subject to modification to incorporate revised BMP requirements.

9.1.2.3 Pollution Prevention in BMPs

BMPs are, by their nature, pollution prevention practices. Traditionally, BMPs have focused on good housekeeping measures and good management techniques that attempt to avoid contact between pollutants and water as a result of leaks, spills, and improper waste disposal. However, on the basis of the authority granted under the regulations, BMPs may include a range of pollution prevention options, including production modifications, operational changes, materials substitution, and materials and water conservation.

When developing BMPs, permit writers should be familiar with the fundamental principles of pollution prevention:

- Pollution should be prevented or reduced at the source, whenever feasible (*Reduce*).
- Pollution that cannot be prevented should be reused or recycled in an environmentally safe manner, whenever feasible (*Reuse-Recycle*).
- Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner, whenever feasible (*Treat*).
- Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner (*Dispose of*).

When writing an NPDES permit, a permit writer who has familiarity with a certain type of processes might identify pollution prevention practices that are not used at a facility and that would help that facility achieve its pollution prevention goals. Where the pollution prevention practices are necessary to carry out the purposes and intent of the CWA, the permit writer may develop BMPs to implement those practices.

9.1.3 Compliance Schedules

The NPDES regulations at § 122.47 allow permit writers to establish schedules of compliance to give permittees additional time to achieve compliance with the CWA and applicable regulations. Schedules developed under this provision must require compliance by the permittee *as soon as possible*, but may not extend the date for final compliance beyond compliance dates established by the CWA. Thus, compliance schedules in permits are not appropriate for every type of permit requirement. Specifically, a permit writer may not establish a compliance schedule in a permit for TBELs because the statutory deadlines for meeting technology standards (i.e., secondary treatment standards and effluent guidelines) have passed. This restriction applies to both existing and new dischargers. Permit writers should note, however, that § 122.29(d)(4) allows a new source or new discharger up to 90 days to *start-up* its pollution control equipment and achieve compliance with its permit conditions (i.e., provides for up to a 90-day period to achieve compliance).

Examples of requirements for which a compliance schedule in an NPDES permit might be appropriate include:

- Pretreatment program development.
- Sludge use and disposal program development and implementation.
- BMP plan development and implementation.
- Effluent limitations derived from new or revised water quality standards.

An EPA Administrator's decision specifically addresses compliance schedules for effluent limitations derived from new or revised water quality standards. In the decision *In the Matter of Star-Kist Caribe, Inc*., documented in the memorandum *Order Denying Modification Request With Respect to the Administrator's 1990 Decision in Star-Kist Caribe, Inc. (NPDES Appeal No. 88-5)*[10] <www.epa.gov/npdes/pubs/owm0121.pdf>, the EPA Administrator interpreted CWA section 301(b)(1)(C) to mean that 1) after July 1, 1977, permits may not contain compliance schedules for effluent limitations based on water quality standards adopted before July 1, 1977, and 2) compliance schedules are allowed for effluent limitations based on standards adopted after that date *only* if the state has clearly indicated in its water quality standards or implementing regulations that it intends to allow them.

In May 2007, the Director of EPA's Office of Wastewater Management issued a memorandum to EPA Region 9 that clarified the requirements of § 122.47 as they relate to WQBELs [see *Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits*[11] <www.epa.gov/npdes/pubs/memo_complianceschedules_may07.pdf>. Permit writers should consider the principles outlined in this memo when assessing whether a compliance schedule for achieving a WQBEL is consistent with the CWA and its implementing regulations and when documenting the basis for a compliance schedule in a permit. Considerations outlined in the memo include the following:

- Demonstrate that the permittee cannot immediately comply with the new effluent limitation on the effective date of the permit.
- Include an enforceable *final* effluent limitation and a date for achievement in the permit.
- Justify and document the *appropriateness* of the compliance schedule; factors relevant to a determination that a compliance schedule is appropriate include how much time the discharger had to meet the WQBEL under prior permit(s), whether there is any need for modifications to treatment facilities, operations, or other measures and, if so, how long it would take to implement such modifications.
- Justify and demonstrate that compliance with the final WQBEL is required *as soon as possible*; factors relevant to a determination that a compliance is required as soon as possible include the steps needed to modify or install treatment facilities, operations, or other measures and the time those steps would take.
- Include an enforceable sequence of events leading to compliance with interim milestones for schedules longer than one year.
- Recognize that a schedule solely to provide time to develop a total maximum daily load (TMDL) or to conduct a use attainability analysis (UAA) is not appropriate.

Many of the principles outlined in the memo could be more generally applied to compliance schedules for requirements other than WQBELs.

9.2 Special Conditions for Municipal Facilities

This section explains several common special conditions that are applicable only to municipal facilities. These conditions reflect requirements for publicly owned treatment works (POTWs) to implement and enforce local pretreatment programs for their industrial users; biosolids (sewage sludge) disposal requirements; CSO requirements; SSO requirements; and municipal separate storm sewer system (MS4) requirements.

9.2.1 The National Pretreatment Program

CWA section 402(b)(8) requires that certain POTWs receiving pollutants from significant industrial sources (subject to CWA section 307(b) standards) establish a pretreatment program to ensure compliance with these standards. The implementing regulations at § 403.8(a) state that:

> Any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (mgd) and receiving from industrial users pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards will be required to establish a POTW pretreatment program unless the NPDES state exercises its option to assume local responsibilities as provided in § 403.10(e).

As specified in § 403.8(a), the Regional Administrator or Director of an authorized state may require a POTW with a design flow of 5 mgd or less to develop a POTW pretreatment program. Program development could be determined to be necessary to prevent interference with or pass through of the POTW based on the nature, or volume, of the industrial influent, a history of treatment process upsets and violations of POTW effluent limitation(s), and contamination of municipal sludge.

Since 1978, approximately 1,500 POTWs have been required to develop and implement pretreatment programs through special conditions of NPDES permits. The pretreatment program was developed to control industrial discharges to POTWs and to meet the following objectives:

- To prevent pass through of pollutants.
- To prevent interference with POTW processes, including interference with the use or disposal of municipal sludge.
- To improve opportunities to recycle and reclaim municipal and industrial wastewater and sludges.

The pretreatment program also helps ensure POTW personnel health and safety.

As authorized by the pretreatment regulations at §§ 403.8(c), 403.8(d) and 403.8(e) and the NPDES regulations at § 122.44(j)(2), the requirements to develop and implement a POTW pretreatment program are included as enforceable conditions in the POTW's NPDES permit. NPDES permits drive the development and implementation of pretreatment programs by requiring the following:

- Adequate legal authority.
- Maintenance of an industrial user inventory.
- Development and implementation of local limits.
- Control mechanisms issued to significant industrial users (SIUs).
- Compliance monitoring activities.
- Swift and effective enforcement.
- Data management and recordkeeping.
- Reporting to the approval authority (EPA or state).
- Public participation.

Through the NPDES permit, the POTW is required to develop and implement a pretreatment program. The POTW is required to submit an approvable program that meets the requirements in § 403.9(b). A more detailed description of these required program elements is in § 403.8(f). The POTW must have the legal authority enabling it to do the following:

- Deny or condition new or increased contributions of pollutants, or changes in nature of pollutants, to the POTW by industrial users.
- Require compliance with applicable pretreatment standards and requirements by industrial users.
- Control through a permit, order, or similar means the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements. These control mechanisms must have certain conditions as laid out in § 403.8(f)(1)(iii) and be enforceable.
- Require the development of compliance schedules where necessary by each industrial user for the installation of technology required to meet applicable pretreatment standards and requirements, and submission of all notices and self-monitoring reports to assess and ensure compliance.
- Carry out all inspection, surveillance, and monitoring procedures necessary to determine compliance with applicable pretreatment standards and requirements independent of information submitted by the industrial user (including the authority to enter the premises of the industrial user).
- Obtain remedies for noncompliance (e.g., injunctive relief, penalties).
- Comply with confidentiality requirements.

Further, at a minimum, the POTW must have procedures to do the following:

- Identify and locate all possible industrial users that might be subject to the POTW pretreatment program.
- Identify the character and volume of pollutants contributed to the POTW by the industrial users.
- Notify industrial users of applicable pretreatment standards and applicable requirements under CWA sections 204(b) and 405 and RCRA Subtitles C and D.
- Receive and analyze self-monitoring reports.
- Conduct sampling, inspections and other surveillance activities to determine compliance with applicable pretreatment standards and requirements independent of information supplied by the industrial user.
- Investigate instances of noncompliance.
- Comply with public participation requirements, including annual public notice of industrial users determined to be in significant noncompliance during the previous 12-month period.

Also, as part of the POTW pretreatment program, POTWs must have adequate resources and funding to implement the program, evaluate the need for and, as necessary, develop local limits and develop an enforcement response plan.

The NPDES permit should include the conditions specified in § 403.9, including that the POTW be required to submit the program documentation, detailing the authority and procedures to be implemented, along with other information about the program. The permit will allow the POTW up to one year, from the time when written notification from the approval authority determined the need for a pretreatment program, to develop and submit a program for approval as stated in § 403.8(b). Once the permitting authority reviews and approves the program, the requirement to implement the approved program is then incorporated into the permit.

The permit writer generally incorporates the requirement to develop a pretreatment program at the time of permit reissuance. The requirement, however, may also be incorporated through a modification of the permit if there is *cause*, as defined in detail in § 403.8(e), to make such a modification. The permit writer must follow procedures outlined by § 122.62 related to modifications when including the requirement to develop a pretreatment program in an NPDES permit

During the life of the permit, it might be necessary for the POTW to modify its approved pretreatment program (changes to local limits, changes to the ordinance, and such). The changes can be brought about by the POTW's desire to change the way the program operates, or they can be the result of changes that are necessary to address deficiencies in the program found during inspections or audits done by the permitting authority. Whatever the reason for the modification, the permitting authority must review and approve any modification to the approved program that is considered substantial, as required by § 403.18. All substantial program modifications to the POTW's approved pretreatment program require minor modifications to the NPDES permit and are subject to the procedural requirements in §§ 122.63(g) and 403.18. In addition, incorporating the requirement for a previously approved pretreatment program for the purpose of making the implementation of the program an enforceable part of the permit is also considered a minor modification to the NPDES permit.

The majority of POTWs that need pretreatment program requirements in their permits currently have them in place. In addition, an NPDES state or an EPA region will often designate a pretreatment coordinator to serve as the pretreatment expert to review the annual report from the POTW and recommend any action to be taken. The state or EPA regional pretreatment coordinator is a key resource on pretreatment issues, particularly at the time of NPDES permit reissuance. EPA regions and approved states have developed standard pretreatment development or implementation conditions (with minor modifications made to tailor the conditions to the specific discharger) that are placed in all applicable NPDES permits in that region or state. The permit writer can usually obtain examples of these NPDES pretreatment conditions from the EPA or state pretreatment coordinators. The permit writer might need to update or modify pretreatment implementation language or initiate corrective action related to the pretreatment program.

EPA has developed the Pretreatment Program Website <www.epa.gov/npdes/pretreatment> and prepared a number of guidance manuals for POTWs on how to implement their local pretreatment programs that are accessible through this website. In addition, EPA prepared the *Introduction to the National Pretreatment Program*[12] <www.epa.gov/npdes/pubs/final99.pdf> as a reference for anyone interested in understanding the basics of pretreatment program requirements and to provide a roadmap to additional and more detailed guidance materials for those trying to implement specific elements of the pretreatment program.

Pretreatment program information and monitoring data obtained through the POTW's pretreatment program are useful to the permit writer in identifying possible modifications to the pretreatment program's local limits or procedures, or the need for water quality-based controls. The permit writer should obtain such data with the aid of the pretreatment coordinator. Permits must include conditions requiring a POTW to provide a written technical evaluation of the need to revise local limits under § 403.5(c)(1) following permit issuance or reissuance [§ 122.44(j)(2)(ii)]. In addition, POTWs with a design flow greater than or equal to one mgd and with an approved pretreatment program or required to develop a pretreatment program must sample and analyze their effluent for priority (toxic) pollutants listed in Part 122, Appendix J, Table 2 as part of the permit application process [see § 122.21(j)(4)(iv)]. Those data and information also are useful for determining the need for WQBELs.

9.2.2 Biosolids (Sewage Sludge)

CWA section 405(d) requires that EPA regulate the use and disposal of sewage sludge to protect public health and the environment from any reasonably anticipated adverse effects of these practices. In the CWA, Congress directed EPA to develop technical standards for municipal sludge use and disposal options and enacted strict deadlines for compliance with these standards. Within one year of promulgation of the standards, compliance was required unless construction of new pollution control facilities was necessary, in which case compliance was required within two years.

EPA promulgated Part 503, Standards for the Use or Disposal of Sewage Sludge in 58 *Federal Register* (FR) 9248, February 19, 1993, with amendments in 59 FR 9095, February 19, 1994 and 60 FR 54764, October 25, 1995. These regulations address four sludge use and disposal practices: land application, surface disposal, incineration, and disposal in a municipal solid waste landfill. The standards for each end use and disposal method consist of general requirements, numeric effluent limitations, operational standards, and management practices, as well as monitoring, recordkeeping, and reporting requirements. Unlike technology standards, which are based on the ability of treatment technologies to reduce the level of pollutants, EPA's sewage sludge standards are based on health and environmental risks. Part 503 imposes requirements on four groups:

- Persons who prepare sewage sludge or material derived from sewage sludge.
- Land appliers of sewage sludge.
- Owners/operators of sewage sludge surface disposal sites.
- Owners/operators of sewage sludge incinerators.

Details of that rule are described in *A Plain English Guide to the EPA Part 503 Biosolids Rule*[13] <www.epa.gov/owm/mtb/biosolids/503pe/>.

The risk assessment for the Part 503 rule that governs the land application of biosolids took nearly 10 years to complete and had extensive rigorous review and comment. The risk assessment evaluated and established limitations for a number of pollutants. These limitations are in chapter 4 of *A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule*[14] <www.epa.gov/owm/mtb/biosolids/503rule/>.

The regulation is largely self-implementing, and anyone who engages in activities covered by the regulation must comply with the appropriate requirements on or before the compliance deadlines. A person who violates Part 503 requirements is subject to administrative, civil, and criminal enforcement actions.

CWA section 405(f) requires the inclusion of sewage sludge use or disposal requirements in any NPDES permit issued to a Treatment Works Treating Domestic Sewage (TWTDS) and authorizes the issuance of sewage sludge-only permits to non-discharging TWTDS. In response, EPA promulgated revisions to the NPDES permit regulations at Parts 122 and 124 in 54 FR 18716, May 2, 1989, to address inclusion of sewage sludge use and disposal standards in NPDES permits and NPDES permit issuance to treatment works that do not have an effluent discharge to waters of the United States, but are involved in sewage sludge use or disposal as preparers, appliers, or owners/operators. TWTDS includes all sewage sludge generators and facilities, such as blenders, that change the quality of sewage sludge.

EPA recognizes that implementation of Part 503 requirements is a source of confusion for permit writers and permittees who might already have NPDES permits with special conditions addressing sewage sludge requirements. EPA has provided several guidance documents to help clarify NPDES permitting expectations, and explain the requirements of Part 503:

- *Part 503 Implementation Guidance*[15] <www.epa.gov/npdes/pubs/owm0237.pdf>.
- *Land Application of Sewage Sludge—A Guide for Land Appliers on the Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge Management in 40 CFR Part 503*[16] <www.epa.gov/npdes/pubs/sludge.pdf>.
- *Surface Disposal of Sewage Sludge—A Guide for Owners/Operators of Surface Disposal Facilities on the Monitoring, Recordkeeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge in 40 CFR Part 503*[17] <No Link–see the endnote for ordering instructions>.
- *Preparing Sewage Sludge for Land Application or Surface Disposal—A Guide for Preparers of Sewage Sludge on the Monitoring, Record Keeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge in 40 CFR Part 503*[18] <No Link–see the endnote for ordering instructions>.
- *Domestic Septage Regulatory Guidance, A Guide to the EPA 503 Rule*[19] <www.epa.gov/npdes/pubs/owm0026.pdf>.
- *Control of Pathogens and Vector Attraction in Sewage Sludge*[20] <www.epa.gov/nrmrl/pubs/625r92013/625R92013.pdf>.

The permit writer should refer to the *Part 503 Implementation Guidance* and EPA Region and state guidelines or policies for instructions on how to implement the applicable Part 503 standards into the permit. The permit writer will need to determine the type of sewage sludge use or disposal practice(s) used by the discharger and apply the appropriate Part 503 standards. In general, conditions will need to be established to address the following:

- Pollutant concentrations or loading rates.
- Operational standards (such as pathogen and vector attraction reduction requirements for land application and surface disposal and total hydrocarbons (THC) concentrations for incinerators).
- Management practices (e.g., siting restrictions, design requirements, operating practices).
- Monitoring requirements (e.g., pollutants to be monitored, sampling locations, frequency, and sample collection and analytical methods).

- Recordkeeping requirements.
- Reporting requirements (e.g., contents of reports and frequency or due dates for submission of reports).
- General requirements (e.g., specific notification requirements before land application, submission of closure and post closure plan for surface disposal sites).

In addition to any specific applicable Part 503 standards, three boilerplate conditions must be written in the NPDES permit where applicable. These consist of the following:

- Text requiring the POTW/TWTDS to comply with all existing requirements for sewage sludge use and disposal, including the Part 503 standards [see § 122.44(b)(2)].
- A reopener clause, which authorizes reopening a permit to include technical standards if the technical standards are more stringent or more comprehensive than the conditions in the permit [see § 122.44(c)].
- A notification provision requiring the permittee to give notice to the permitting authority when a significant change in the sewage sludge use or disposal practice occurs (or is planned) [see standard conditions in § 122.41(l)(1)(iii)].

If permit conditions based on existing regulations are insufficient to protect public health and the environment from adverse effects that could occur from toxic pollutants in sewage sludge, permit conditions should be developed on a case-by-case basis using best professional judgment (BPJ) to fulfill the statutory requirement. The *Part 503 Implementation Guidance* contains information to assist permit writers in developing effluent limitations and management practice requirements on a case-by-case basis to protect public health and the environment from adverse effects that could occur from toxic pollutants in sewage sludge. For more information on biosolids, see section 2.3.1.3 of this manual and the Biosolids Website <www.epa.gov/owm/mtb/biosolids/index.htm>

9.2.3 Combined Sewer Overflows (CSOs)

Combined sewer systems were designed and built in the 19th and early 20th centuries to collect sanitary and industrial wastewater and stormwater runoff. During dry weather, combined sewers carry sanitary wastes and industrial wastewater to a treatment plant. In periods of heavy rainfall, however, stormwater is combined with untreated wastewater, which can overflow and discharge directly to a waterbody without being treated. These overflows are called combined sewer overflows (CSOs).

EPA published a CSO Control Policy in 59 FR 18688, April 19, 1994. That policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities, and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives.

The CSO Control Policy includes expectations for NPDES permitting authorities. In general, EPA envisioned a phased permit approach, including initial requirements to implement Nine Minimum CSO Controls (NMC) and develop a Long-Term CSO Control Plan (LTCP), followed by requirements to implement the controls in the approved LTCP. The Wet Weather Water Quality Act of 2000 amended the CWA to add section 402(q), which required that CSO permits be issued in conformance with the CSO Control Policy.

CSOs are point source discharges subject to both the technology-based requirements of the CWA and applicable state water quality standards. Under the CWA, CSOs must comply with Best Available Technology Economically Achievable (BAT) for nonconventional and toxic pollutants and Best Conventional Technology (BCT) for conventional pollutants. However, there are no promulgated BAT or BCT limitations in effluent guidelines for CSOs. As a result, permit writers must use BPJ in developing technology-based permit requirements for controlling CSOs. Permit conditions also must achieve compliance with applicable water quality standards.

The 1994 CSO Control Policy contains the recommended approach for developing and issuing NPDES permits to control CSOs. In addition, EPA has developed the following CSO guidance documents to help permit writers and permittees implement the CSO Control Policy:

- *Combined Sewer Overflows–Guidance for Long-Term Control Plan*[21] <www.epa.gov/npdes/pubs/owm0272.pdf>.
- *Combined Sewer Overflows–Guidance for Nine Minimum Controls*[22] <www.epa.gov/npdes/pubs/owm0030.pdf>.
- *Combined Sewer Overflows–Guidance for Screening and Ranking*[23] <www.epa.gov/npdes/cso>.
- *Combined Sewer Overflows–Guidance for Monitoring and Modeling*[24] <www.epa.gov/npdes/pubs/sewer.pdf>.
- *Combined Sewer Overflows–Guidance for Financial Capability Assessment and Schedule Development*[25] <www.epa.gov/npdes/pubs/csofc.pdf>.
- *Combined Sewer Overflows–Guidance for Funding Options*[26] <www.epa.gov/npdes/pubs/owm0249.pdf>.
- *Combined Sewer Overflows–Guidance for Permit Writers*[27] <www.epa.gov/npdes/cso>.
- *Combined Sewer Overflows–Guidance: Coordinating Combined Sewer Overflow Long-Term Planning with Water Quality Standards Reviews*[28] <www.epa.gov/npdes/pubs/wqs_guide_final.pdf>.

Combined Sewer Overflows–Guidance for Permit Writers[24] contains guidance and example permit language that permit writers can use. Controlling CSOs typically requires substantial long-term planning, construction, financing and continuous reassessment; therefore, the implementation of CSO controls will probably occur over several permit cycles. The guidance explains a phased permitting approach to CSOs. Exhibit 9-2 depicts this phased permitting approach and the types of permit conditions that should be developed for each phase.

Exhibit 9-2 Categories of CSO permitting conditions

NPDES permit	Phase I	Phase II	Post phase II
A. Technology-based	• NMC, at a minimum	• NMC, at a minimum	• NMC, at a minimum
B. Water Quality-based	• Narrative	• Narrative + performance-based standards	• Narrative + performance-based standards + numeric WQBELs (as appropriate)
C. Monitoring	• Characterization, monitoring, and modeling of CSS	• Monitoring to evaluate water quality impacts • Monitoring to determine effectiveness of CSO controls	• Post-construction compliance monitoring
D. Reporting	• Documentation of NMC implementation • Interim LTCP deliverables	• Implementation of CSO controls (both NMC and long-term controls)	• Report results of post-construction compliance monitoring
E. Special conditions	• Prohibition of dry weather overflows (DWO) • Development of LTCP	• Prohibition of DWO • Implementation of LTCP • Reopener clause for water quality standards violations • Sensitive area reassessment	• Prohibition of DWO • Reopener clause for water quality standards violations

Depending on the permittee's situation, a permit may contain both Phase I and Phase II elements. Phase I permits require demonstration of implementation of the NMC, shown in Exhibit 9-3.

Exhibit 9-3 Nine minimum CSO controls

1.	Proper operation and regular maintenance programs for the sewer system and the CSOs
2.	Maximum use of the collection system for storage
3.	Review and modification of pretreatment requirements to ensure that CSO impacts are minimized
4.	Maximization of flow to the POTW for treatment
5.	Prohibition of CSOs during dry weather
6.	Control of solid and floatable materials in CSOs
7.	Establishment of pollution prevention programs
8.	Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts
9.	Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls

In the Phase I permit issued/modified to reflect the CSO Control Policy, the NPDES authority should at least require permittees to

- Immediately implement BAT/BCT, which at a minimum includes the NMC, as determined on a BPJ basis by the permitting authority.
- Develop and submit a report documenting the implementation of the NMC within 2 years of permit issuance/modification.

- Comply with applicable water quality standards, no later than the date allowed under the state's water quality standards expressed in the form of a narrative limitation.
- Develop and submit, consistent with the CSO Control Policy and based on a schedule in an appropriate enforceable mechanism, an LTCP, as soon as practicable, but generally within 2 years after the effective date of the permit issuance/modification. Permitting authorities may establish a longer timetable for completion of the long-term CSO control plan on a case-by-case basis to account for site-specific factors that could influence the complexity of the planning process. Exhibit 9-4 shows the minimum elements of the LTCP.

Exhibit 9-4 Elements of the long-term CSO control plan

1. Characterization, monitoring, and modeling of the combined sewer system
2. Public participation
3. Consideration of sensitive areas
4. Evaluation of alternatives
5. Cost/performance considerations
6. Operational plan
7. Maximizing treatment at the existing POTW treatment plant
8. Implementation schedule
9. Post-construction compliance monitoring program

Phase II permits require the implementation of an LTCP. The Phase II permit should contain the following:

- Requirements to implement the technology-based controls including the NMC determined on a BPJ basis.
- Narrative requirements that ensure that the selected CSO controls are implemented, operated and maintained as described in the LTCP.
- Water quality-based effluent limits under §§ 122.44(d)(1) and 122.44(k), requiring, at a minimum, compliance with, no later than the date allowed under the state's water quality standards, the numeric performance standards for the selected CSO controls, based on average design conditions specifying at least one of the following:
  - A maximum number of overflow events per year for specified design conditions consistent with II.C.4.a.i of the CSO Control Policy.
  - A minimum percentage capture of combined sewage by volume for treatment under specified design conditions consistent with II.C.4.a.ii of the CSO Control Policy.
  - A minimum removal of the mass of pollutants discharged for specified design conditions consistent with II.C.4.a.iii of CSO Control Policy.
  - Performance standards and requirements that are consistent with II.C.4.b of the CSO Control Policy.
- A requirement to implement, with an established schedule, the approved post-construction water quality assessment program including requirements to monitor and collect sufficient information to demonstrate compliance with water quality standards and protection of designated uses as well as to determine the effectiveness of CSO controls.

- A requirement to reassess overflows to sensitive areas in those cases where elimination or relocation of the overflow is not physically possible and economically achievable.
- Conditions establishing requirements for maximizing the treatment of wet-weather flows at the POTW, as appropriate, consistent with section II.C.7. of the CSO Policy.
- A reopener clause authorizing the NPDES authority to reopen and modify the permit upon determination that the CSO controls fail to meet water quality standards or protect designated uses.

Reviewing the permittee's LTCP and consultations with other staff involved in the CSO control process and the permittee are important steps in the process of determining the appropriate Phase II permit conditions. Water quality-based controls in Phase II generally are expressed as narrative requirements and performance standards for the combined sewer system. Finally, post Phase II permit conditions would address continued implementation of the NMC, long-term CSO controls, and post-construction compliance monitoring. There may also be numeric WQBELs when there are sufficient data to support their development.

LTCP implementation schedules were expected to include project milestones and a financing plan for design and construction of necessary controls as soon as practicable. The CSO Control Policy expected permitting authorities to undertake the following:

- Review and revise, as appropriate, state CSO permitting strategies developed in response to the National CSO Control Strategy.
- Develop and issue permits requiring CSO communities to immediately implement the NMC and document their implementation and develop and implement an LTCP.
- Promote coordination among the CSO community, the water quality standards authority, and the general public through LTCP development and implementation.
- Evaluate water pollution control needs on a watershed basis and coordinate CSO control with the control of other point and nonpoint sources of pollution.
- Recognize that it might be difficult for some small communities to meet all the formal elements of LTCP development, and that compliance with the NMC and a reduced scope LTCP might be sufficient.
- Consider sensitive areas, use impairment, and a CSO community's financial capability in the review and approval of implementation schedules.

Communities must develop and implement LTCPs to meet water quality standards, including the designated uses and criteria to protect those uses for waterbodies that receive CSO discharges. The CSO Control Policy recognized that substantial coordination and agreement among the permitting authority, the water quality standards authority, the public, and the CSO community would be required to accomplish this objective. The CSO Control Policy also recognized that the development of the LTCP should be coordinated with the review and appropriate revision of water quality standards and their implementation procedures.

In developing permit requirements to meet technology-based requirements and applicable state water quality standards, the permit writer, in conjunction with staff involved in water quality standards and the

permittee, should identify the appropriate site-specific considerations that will determine the CSO conditions to be established in the permit. EPA believes that the following information will be particularly relevant in developing the appropriate conditions:

- CSO Discharge
  - Flow, frequency, and duration of the CSO discharge.
  - Available effluent characterization data on the CSO discharge.
  - Available information and data on the impacts of the CSO discharge(s) (e.g., CWA section 305(b) reports, ambient survey data, fish kills, CWA section 303(d) lists of impaired waters).
  - Compliance history of the CSO owner, including performance and reliability of any existing CSO controls.
  - Current NPDES permit and NPDES permit application.
  - Facility planning information from the permittee that addresses CSOs.
- Technologies
  - Performance data (either from the manufacturer or from other applications) for various CSO technologies that may be employed, including equipment efficiency and reliability.
  - Cost information associated with the installation, operation and maintenance of CSO technologies.
  - Reference materials on various types of CSO.

For more information on CSOs, see section 2.3.1.4 of this manual and the Combined Sewer Overflows Website <www.epa.gov/npdes/cso>.

9.2.4 Sanitary Sewer Overflows (SSOs)

EPA's *Report to Congress on the Impacts and Control of CSOs and SSOs*[29] <www.epa.gov/npdes/csossoreport2004> shows that NPDES permit requirements establishing clear reporting, recordkeeping and third party notification of overflows from municipal sewage collection systems, as well as clear requirements to properly operate and maintain the collection system, are critical to effective program implementation. NPDES authorities should be improving NPDES permit requirements for SSOs and sanitary sewer collection systems, which could lead to improved performance of municipal sanitary sewer collection systems and improved public notice for SSO events.

The NPDES regulations provide standard conditions that are to be in NPDES permits for POTWs as discussed in Chapter 10 of this manual. Standard conditions in a permit for a POTW apply to portions of the collection system for which the permittee has ownership or has operational control. When reissued, permits for POTW discharges should clarify how key standard permit conditions apply to SSOs and sanitary sewer collection systems. On August 20, 2007, EPA circulated a draft fact sheet, NPDES Permit Requirements for Municipal Sanitary Sewer Collection Systems and SSOs <www.epa.gov/npdes/pubs/sso_fact_sheet_model_permit_cond.pdf>, which explains the ways NPDES permitting authorities should be improving implementation of NPDES permit requirements to address SSOs and sanitary sewer collection systems.

The draft fact sheet indicates that clarifications should address the particular application of standard permit conditions to SSOs and municipal sanitary sewer collection systems as discussed below.

- **Immediate reporting.** Permits should clarify that the permittee is required to notify the NPDES authority of an overflow that could endanger health or the environment from portions of the collection system over which the permittee has ownership or operational control as soon as practicable but within 24 hours of the time the permittee becomes aware of the overflow. [See § 122.41(l)(6)].
- **Written reports**. Permits should clarify that the permittee is required to provide the NPDES authority a written report within 5 days of the time it became aware of any overflow that is subject to the immediate reporting provision. [See § 122.41(l)(6)(i).] In addition, permits should clarify that any overflow that is not immediately reported as indicated above, should be reported in the discharge monitoring report. [See § 122.41(l)(7)].
- **Third party notice.** Permits should establish a process for requiring the permittee or the NPDES authority to notify specified third parties of overflows that could endanger health because of a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that could endanger health because of a likelihood of human exposure. Permits should clarify that the permittee is required to develop, in consultation with appropriate authorities at the local, county, or state level (or any combination), a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, and other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported, to whom they should be reported, the specific information that would be reported, a description of lines of communication, and the identities of responsible officials. [See § 122.41(l)(6)].
- **Recordkeeping**. Permits should clarify that the permittee is required to keep records of overflows. Clarified permit language for recordkeeping should require the permittee to retain the reports submitted to the NPDES authority and other appropriate reports that could include work orders associated with investigation of system problems related to an overflow, that describes the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow. [See § 122.41(j)].
- **Capacity, management, operation and maintenance programs.** Permits should clarify requirements for proper operation and maintenance of the collection system. [See §§ 122.41(d) and 122.41(e)]. This may include requiring the development and implementation of capacity, management, operation and maintenance (CMOM) programs. EPA's Region 4 has developed materials and guidance that can help a municipality with its CMOM program on the Management, Operation and Maintenance (MOM) Programs Project Website <www.epa.gov/region4/water/wpeb/momproject/>. The CMOM program may use a process for self-assessment and information management techniques for ongoing program improvement and may develop and implement emergency response procedures to overflows. In addition, the CMOM permit condition may specify appropriate documentation requirements, including the following:
  - CMOM program summary. Permittees may be required to develop a written summary of their CMOM programs, which would be available to the NPDES authority and public on request. The program summary would give an overview of the management program and summarize major implementation activities.

- Program audit report. Permittees may be required to conduct comprehensive audits of their programs during the permit cycle, and submit a copy of the audit report to the NPDES authority with the application for permit renewal. EPA's Sanitary Sewer Overflow Toolbox Website <www.epa.gov/npdes/sso/ssotoolbox> provides information on CMOM.
- System evaluation and capacity assurance plan. Capacity assurance refers to a process to identify, characterize and address hydraulic deficiencies in a sanitary sewer collection system. The permit may require the permittee to implement a program to assess the current capacity of the collection system and treatment facilities that they own or over which they have operational control to ensure that discharges from unauthorized locations do not occur. Where peak flow conditions contribute to an SSO discharge or to noncompliance at a treatment plant, the permittee may be required to prepare and implement a system evaluation and capacity assurance plan. In some instances, the permittee may already be under an enforceable obligation and schedule, in which case this permit provision would be redundant and, thus, unnecessary.

Section 2.3.1.5 of this manual and EPA's Sanitary Sewer Overflows Website <www.epa.gov/npdes/sso> provide more information on SSOs.

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[28] U.S. Environmental Protection Agency. 2001. *Combined Sewer Overflows–Guidance: Coordinating Combined Sewer Overflow (CSO) Long-Term Planning with Water Quality Standards Reviews*. EPA-833/R-01-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/wqs_guide_final.pdf>.

[29] U.S. Environmental Protection Agency. 2004. *Report to Congress on the Impacts and Control of CSOs and SSOs*. EPA 833-R-04-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/csossoreport2004>.

CHAPTER 10. Standard Conditions of NPDES Permits

This chapter describes standard conditions, sometimes called *boilerplate* conditions, that must be incorporated in National Pollutant Discharge Elimination System (NPDES) permits. Standard conditions, specified in Title 40 of the *Code of Federal Regulations* (CFR) 122.41 and 122.42, play an important supporting role to effluent limitations, monitoring and reporting requirements, and special conditions because they delineate various legal, administrative, and procedural requirements of the permit. Standard conditions cover various topics, including definitions, testing procedures, records retention, notification requirements, penalties for noncompliance, and other permittee responsibilities. The conditions provided in § 122.41 apply to all types and categories of NPDES permits and must be included in all permits (see § 123.25 for applicability to state NPDES permits). The conditions provided in § 122.42 apply only to certain categories of NPDES facilities. Any permit issued to a facility in one of the categories listed in § 122.42 must contain the additional conditions, as applicable.

The use of standard conditions helps ensure uniformity and consistency of all NPDES permits issued by authorized states or the U.S. Environmental Protection Agency (EPA) Regional Offices. Permit writers need to be aware of the contents of the standard conditions because it might be necessary to explain portions of the conditions to a discharger. The permit writer should keep abreast of any changes in EPA's standard conditions set out in §§ 122.41 and 122.42. According to § 122.41, standard conditions may be incorporated into a permit either expressly (verbatim from the regulations) or by reference to the regulations. It generally is preferable for permit writers to attach the standard conditions expressly because permittees might not have easy access to the regulations. Some states have developed an attachment for NPDES permits that includes the federal standard conditions.

10.1 Types of Standard Conditions

A brief summary of the § 122.41 standard conditions that must be included in all types of NPDES permits follows:

- **Duty to Comply** § 122.41(a): The permittee must comply with all conditions of the permit. Noncompliance is a violation of the Clean Water Act (CWA) and is grounds for enforcement action, changes to or termination of the permit, or denial of a permit renewal application.
- **Duty to Reapply** § 122.41(b): A permittee wishing to continue permitted activities after the permit expiration date must reapply for and obtain a new permit.
- **Need to Halt or Reduce Activity not a Defense** § 122.41(c): The permittee may not use as a defense in an enforcement action the reasoning that halting or reducing the permitted activity is the only way to maintain compliance.
- **Duty to Mitigate** § 122.41(d): The permittee is required to take all reasonable steps to prevent any discharge or sludge use or disposal in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment.
- **Proper Operation and Maintenance** § 122.41(e): The permittee must properly operate and maintain all equipment and treatment systems used for compliance with the terms of the permit.

The permittee must provide appropriate laboratory controls and quality assurance procedures. Operation of backup systems is required only when needed to ensure compliance.

- **Permit Actions** § 122.41(f): The permit may be modified, revoked and reissued, or terminated for cause. A request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance does not suspend the permittee's obligation to comply with all permit conditions.
- **Property Rights** § 122.41(g): The permit does not convey any property rights of any sort, or any exclusive privilege.
- **Duty to Provide Information** § 122.41(h): The permittee must furnish, within a reasonable time, any information needed to determine compliance with the permit or to determine whether there is cause to modify, revoke and reissue, or terminate the permit. The permittee also must furnish, on request, copies of records that must be kept as required by the permit.
- **Inspection and Entry** § 122.41(i): The permittee must, upon presentation of valid credentials by the Director or his or her representative, allow entry into the premises where the regulated activity or records are present. The Director must have access to and be able to make copies of any required records; inspect facilities, practices, operations, and equipment; and sample or monitor at reasonable times.
- **Monitoring and Records** § 122.41(j): Samples must be representative of the monitored activity. The permittee must retain records for 3 years (5 years for sewage sludge activities) subject to extension by the Director. Monitoring records must identify the sampling dates and personnel, the sample location and time, and the analytical techniques used and corresponding results. Wastewater and sludge measurements must be conducted in accordance with Parts 136 or 503 or other specified procedures. Falsification of results is a violation under the CWA.
- **Signatory Requirement** § 122.41(k): The permittee must sign and certify applications, reports, or information submitted to the Director in accordance with the requirements in § 122.22. Knowingly making false statements, representations, or certifications is punishable by fines or imprisonment.
- **Planned Changes** § 122.41(l)(1): Notice must be given to the Director as soon as possible of planned physical alterations or additions to the facility (or both) that could meet the criteria for determining whether the facility is a new source under § 122.29(b); result in changes in the nature or quantity of pollutants discharged; or significantly change sludge use or disposal practices.
- **Anticipated Noncompliance** § 122.41(l)(2): The permittee must give advance notice of any planned changes that could result in noncompliance.
- **Permit Transfers** § 122.41(l)(3): The permit is not transferable except after written notice to the Director. The Director may require modification or revocation and reissuance, as necessary.
- **Monitoring Reports** § 122.41(l)(4): Monitoring results must be reported at the frequency specified in the permit and be reported on a discharge monitoring report (DMR) or forms provided or specified by the Director for reporting results of monitoring sludge use or disposal practices. Monitoring for any pollutant that occurs more frequently than is required by the permit and uses approved test procedures or test procedures specified in the permit must also be reported. Calculations requiring averaging must use an arithmetic mean unless otherwise specified in the permit.

- **Compliance Schedules** § 122.41(l)(5): Reports of compliance or noncompliance or any progress report must be submitted no later than 14 days following the interim or final compliance date specified in a compliance schedule.
- **Twenty-Four Hour Reporting** § 122.41(l)(6): The permittee must orally report any noncompliance that might endanger human health or the environment within 24 hours after becoming aware of the circumstances. Within 5 days of becoming aware of the circumstances, the permittee must provide a written submission including a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the anticipated time the noncompliance is expected to continue (if not already corrected); and steps taken to reduce, eliminate, or prevent reoccurrence unless the Director waives the requirement. In addition, 24-hour reporting is required for an unanticipated bypass exceeding effluent limits; an upset exceeding effluent limits; and a violation of a maximum daily effluent limitation for pollutants listed in the permit for 24-hour reporting.
- **Other Noncompliance** § 122.41(l)(7): The permittee must report all instances of noncompliance not reported under other specific reporting requirements at the time monitoring reports are submitted.
- **Other Information** § 122.41(l)(8): If the permittee becomes aware that it failed to submit any relevant facts in its application, or submitted incorrect information in its application or other reports, it must promptly submit such facts or information.
- **Bypass** § 122.41(m): The intentional diversion of wastestreams from any portion of a treatment facility. Bypass is prohibited unless the bypass does not cause the effluent to exceed limits and is for essential maintenance to assure efficient operation (no notice or 24-hour reporting is required in such a case). All other bypasses are prohibited, and the Director of the NPDES program may take enforcement action against a permittee for a bypass, unless the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, there was no feasible alternative, and the proper notification was submitted.
- **Upset** § 122.41(n): An upset (i.e., an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limits because of factors beyond the permittee's control) can be used as an affirmative defense in actions brought against the permittee for noncompliance. An upset does not include noncompliance to the extent caused by operational error, improperly designed or inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation. The permittee (who has the burden of proof to demonstrate that an upset has occurred) must have operational logs or other evidence that shows
  - When the upset occurred and its causes.
  - The facility was being operated properly.
  - Proper notification was made.
  - Remedial measures were taken.

10.2 Other Standard Conditions

In addition to standard conditions specified in § 122.41 that are applicable to all permittees, § 122.42 includes additional conditions applicable to certain categories of NPDES permits. Below are summaries of these additional standard conditions applicable to various types of NPDES permits.

Non-Municipal (Industrial) Permits: Additional standard conditions applicable to non-municipal permits are found in § 122.42(a) and specify that the permittee must notify the Director as soon as it knows or has reason to believe that the discharge has or will exceed certain notification levels specified in §§ 122.42(a)(1) and (2). In addition, § 122.44(f) allows the Director to establish alternate notification levels upon petition by the permittee or by his or her own initiative.

Publicly Owned Treatment Work (POTW) Permits: Additional standard conditions applicable to POTWs are found in § 122.42(b). The standard conditions specify that the permittee must provide adequate notice to the Director of the new introduction of certain pollutants into the POTW from an indirect discharger and of substantial changes in the volume or character of pollutants introduced into the POTW. That notice must include information on the quality and quantity of effluent introduced to the POTW and information on the impact to the quality and quantity of the POTW's effluent.

Municipal Separate Storm Sewer Systems: Additional standard conditions applicable to large, medium or EPA-designated municipal separate storm sewer systems are in § 122.42(c). Those standard conditions require that the permittee submit an annual report addressing the status, and changes to, the stormwater management program, water quality data and other information specified in §§ 122.42(c)(1)-(6).

Individual Stormwater Permits: Initial permits for discharges composed entirely of stormwater and permitted under § 122.26(e)(7) must require compliance no later than 3 years after permit issuance.

Concentrated Animal Feeding Operations (CAFO) Permits: The regulations at § 122.42(e) specify conditions that must be included in all permits for CAFOs.

CHAPTER 11. NPDES Permit Administration

Previous discussions in this manual focused on the process of developing National Pollutant Discharge Elimination System (NPDES) permit conditions and effluent limitations. This chapter describes the administrative process associated with the issuance of an NPDES permit including a discussion of the other federal laws that might affect the development or issuance of NPDES permits.

11.1 Other Federal Laws Applicable to NPDES Permits

This section addresses other federal laws, besides the Clean Water Act (CWA), that permit writers should consider when drafting an NPDES permit. The requirements imposed under these statutes only apply to federal actions (i.e., U.S. Environmental Protection Agency [EPA] issuance of permits). Permits issued by states authorized to administer the NPDES program are not subject to the requirements of these statutes. However, many states may have enacted state legislation that is modeled on federal law and, therefore, it is prudent to review state law in these areas before preparing an NPDES permit.

The following sections briefly discuss the other federal laws and contain links to other websites for more information. Because these laws are implemented by other federal agencies, many of the links provided below are to websites outside EPA, and EPA is not responsible for the information provided on those websites. The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 122.49 also include a discussion of how some of the laws relate to the federal NPDES program. Exhibit 11-1 presents the other federal laws that are applicable to NPDES permits and includes the legislative citations from the *United States Code* (U.S.C.) and the implementing regulations in the CFR.

Exhibit 11-1 Other federal laws applicable to NPDES permits

Federal law	Year	Federal agency	Legislative citations	Implementing regulations
Endangered Species Act (ESA)	1973	FWS, NMFS	16 U.S.C. 1531 et seq.	50 CFR Part 402
National Environmental Policy Act (NEPA)	1969	CEQ	42 U.S.C. 4321 et seq.	40 CFR Part 6
National Historic Preservation Act (NHPA)	1992	ACHP	16 U.S.C. 470 et seq.	36 CFR Part 800
Coastal Zone Management Act (CZMA)	1972	NOAA	16 U.S.C. 1451 et seq.	15 CFR Part 930
Wild and Scenic Rivers Act	1968	Various	16 U.S.C. 1271 et seq.	36 CFR Part 297
Fish and Wildlife Coordination Act (FWCA)	1934	FWS	16 U.S.C. 661 et seq.	--
Essential Fish Habitat Provisions (EFH)	1996	NOAA	16 U.S.C. 1855(b)(2)	50 CFR Part 600

11.1.1 Endangered Species Act

This section discusses procedures intended to protect endangered species that apply only to permits issued by EPA. The 1973 Endangered Species Act (ESA) <www.fws.gov/endangered/esa-library/pdf/ESAall.pdf>, 16 U.S.C. 1531 *et seq.*, was enacted to protect and conserve endangered and threatened species and critical habitat. The Fish and Wildlife Service (FWS) <www.fws.gov/endangered/> of the Department of the Interior and the National Marine Fisheries Service (NMFS) <www.nmfs.noaa.gov/pr/> of the National

Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce (collectively *the Services*) share primary responsibility for administration of the ESA.

ESA section 7 requires that federal agencies consult with the Services to ensure that any action authorized, funded, or carried out by the agencies that could affect a listed species or critical habitat and to ensure that their actions are not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat of such species. The ESA section 7 regulations are in 50 CFR Part 402. FWS/NMFS published the ESA Section 7 Consultation Handbook <www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF> to address the major consultation processes pursuant to ESA section 7.

Consultation may be either informal or formal. An informal consultation determines if an action is or is not likely to adversely affect the species. A formal consultation is required if the findings from the informal consultation show that there is a likelihood for adverse impacts and evaluates whether the proposed action is likely to jeopardize the continued existence of the species. It is EPA's responsibility to ensure that consultation occurs; however, a nonfederal representative (i.e., the discharger) may be designated for the informal consultation.

On February 22, 2001, EPA entered into a National Memorandum of Agreement (*National MOA*) <www.epa.gov/fedrgstr/EPA-SPECIES/2001/February/Day-22/e2170.pdf> with the Services that outlines the process for consulting on federally issued NPDES permits. In addition, because consultation is not required for state-issued permits, the National MOA includes a process for coordinating with the Services on state-issued permits. EPA permit writers should review the ESA consultation regulations and the ESA section 7 Consultation Handbook, and coordinate with the Region's ESA coordinator (if such a position has been established in a Region) and the Service office(s) nearest to the site.

11.1.2 National Environmental Policy Act

This section discusses environmental review procedures that apply only when EPA issues permits to *new sources* (dischargers subject to New Source Performance Standards). The 1969 National Environmental Policy Act (NEPA) <www.epa.gov/compliance/basics/nepa.html>, 42 U.S.C. 4321 *et seq*., requires that agencies perform environmental impact reviews and prepare an *Environmental Impact Statement* (EIS) for major federal actions significantly affecting the quality of the human environment [see section 102(2)(C)]. The President's Council on Environmental Quality (CEQ) <www.whitehouse.gov/ceq/> coordinates federal environmental efforts to comply with NEPA.

Within EPA, the Office of Federal Activities under the Office of Enforcement and Compliance Assurance (OECA) is responsible for EPA's implementation of NEPA <www.epa.gov/compliance/nepa/>. EPA's NEPA regulations are at 40 CFR Part 6. With respect to NPDES permits, CWA section 511 establishes that only EPA-issued permits to new sources are subject to NEPA's environmental review procedures before permit issuance. States may have their own state law versions of NEPA. Federal permit writers should coordinate efforts with the Office of Federal Activities and document all NEPA activities in the permit file and fact sheet.

11.1.3 National Historic Preservation Act Amendments

Section 106 of the 1992 National Historic Preservation Act (NHPA) <www.achp.gov/nhpa.html>, 16 U.S.C. 470 *et seq.*, as amended, and implementing regulations 36 CFR Part 800 require the Regional Administrator, before issuing a license (permit), to identify the area of potential effect of a permitted discharge and, if historic or cultural resources within that area would be adversely affected by the discharge, to adopt measures when feasible to mitigate potential adverse effects of the licensed activity and properties listed or eligible for listing in the National Register of Historic Places.

The Act's requirements are to be implemented in cooperation with State Historic Preservation Officers <www.achp.gov/shpo.html>, and upon notice to, and when appropriate, in consultation with the Advisory Council on Historic Preservation <www.achp.gov/>, which provides national oversight for the NHPA. A decision by the D.C. Circuit in 2003 concluded that NHPA consultation is not required for state-issued permits (*National Mining Ass'n v. Fowler*, 324 F.3d 752 (D.C. Cir. 2003) <caselaw.findlaw.com/us-dc-circuit/1169695.html>).

Federal permit writers should evaluate potential effects of NHPA and submit written documentation of the evaluation to the State Historic Preservation Office and to the permit file.

11.1.4 Coastal Zone Management Act

The 1972 Coastal Zone Management Act (CZMA) <www.coastalmanagement.noaa.gov/czm/czm_act.html>, 16 U.S.C. 1451 *et seq.*, was enacted to manage the nation's coastal zone and is implemented through a state-federal partnership. Section 307 of the CZMA (16 U.S.C. 1456 and 15 CFR Part 930) prohibits the issuance of federal NPDES permits for activities affecting land or water use in coastal zones unless the permit applicant certifies that the proposed activity complies with the state Coastal Zone Management Program and the relevant state either concurs with the applicant's certification or the state's concurrence is conclusively presumed as a result of the state's failure to concur or non-concur. *Coastal States*, according to the CZMA, include those states and territories adjacent to the Atlantic, Pacific, or Arctic oceans; the Gulf of Mexico; or one or more of the Great Lakes. Any of those states that have completed the development of its management program is required, as a condition of receipt of federal grant money under the CZMA, to adopt coastal management plans, which designate boundaries, identify areas of particular concern, and establish inventories of permitted uses and enforcement policies. Beach access, emergency planning, and erosion control also must be addressed in such plans.

The Office of Ocean and Coastal Resource Management <www.coastalmanagement.noaa.gov/>, which is part of NOAA within the Department of Commerce, oversees the CZMA. The CZMA implementing regulations are at 15 CFR Part 930. EPA and other federal agencies must coordinate their activities on coastal lands with state CZMA plans. Federal permit writers should document all activities relating to CZMA in the permit file.

11.1.5 Wild and Scenic Rivers Act

The 1968 Wild and Scenic Rivers Act (WSRA) <www.rivers.gov/publications/wsr-act.pdf>, 16 U.S.C. 1271 *et seq.*, established a National Wild and Scenic Rivers System (System) and prescribed the process by which additional rivers may be added to this System. Rivers may be added by act of Congress [WSRA section 2(a)(i)] or by the Secretary of the Interior at the initiative of a state governor [WSRA section 2(a)(ii)]. Under WSRA section 7(a), EPA is prohibited from assisting, by license or otherwise, in the construction

of any water resources project that would have a direct and adverse effect on the values for which a national wild and scenic river was established. The WSRA regulations are codified at 36 CFR Part 297.

Federal permit writers should verify whether the receiving water is part of the System and document all activities related to the Act in the permit file and fact sheet. For detailed explanation of WSRA section 7, refer to Wild and Scenic Rivers Act: Section 7 <www.rivers.gov/publications/section-7.pdf>, a technical report of the Interagency Wild and Scenic Rivers Coordinating Council. Permit writers may also refer to Water Quantity and Quality as Related to the Management of Wild and Scenic Rivers <www.rivers.gov/publications/water.pdf>, a technical report of the Interagency Wild and Scenic Rivers Coordinating Council.

11.1.6 Fish and Wildlife Coordination Act

The 1934 Fish and Wildlife Coordination Act (FWCA) <www.fws.gov/habitatconservation/fwca.html>, 16 U.S.C. 661 *et seq.*, requires mitigation for the loss of wildlife habitat due to the construction of federal water resources projects. The FWCA requires designers of federal dams, reservoirs, and irrigation works to include the costs and benefits to fish and wildlife when determining the benefit/cost ratio of a project and requires that EPA and other federal agencies consult with state and federal wildlife and fisheries agencies to minimize the impacts of the activity on fish and wildlife. The FWCA specifically calls for ongoing studies by the U.S. Department of the Interior on the effects of domestic sewage and industrial wastes on fish and wildlife (16 U.S.C. 665).

No implementing regulations directly related to the FWCA and NPDES permits exist. However, the FWCA describes actions taken or compelled by the affected federal agencies. The Water Resources Development under the Fish and Wildlife Coordination Act manual <www.fws.gov/habitatconservation/fwca.pdf> provides the FWS guidance on implementing the FWCA. Federal permit writers should note any FWCA consultation activities in the permit file.

11.1.7 Essential Fish Habitat Provisions

The 1996 Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) promote the protection of essential fish habitat in any federal action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that might adversely affect such habitat identified under the MSA [16 U.S.C. 1855(b)(2)]. The MSA requires that federal agencies, such as EPA, consult with the NMFS for any EPA-issued permits that might adversely affect essential fish habitat identified under the MSA. The regulations applicable to federal agencies' coordination and consultation under the MSA are codified at 50 CFR 600.905 through 600.930, and other EFH information can be found on the NMFS EFH Website <www.habitat.noaa.gov/protection/efh/index.html>. Federal permit writers should note any EFH determinations and consultation activities in the permit file.

11.2 Documentation for Development of the Draft Permit

EPA regulations at 40 CFR 124.2 define a draft permit as a document that indicates the Director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a permit. After the permit is issued, the fact sheet and supporting documentation (administrative record) are the primary support for defending the permit in the administrative appeals process. Documenting the permit requires

the permit writer to be organized and logical throughout the permit development process. Some of the content of the fact sheet and administrative record is specified by federal and state regulation, and the remainder is dictated by good project management. Permit writers should recognize the importance of

- Developing a thorough permit in a logical fashion.
- Meeting legal requirements for preparation of an administrative record, fact sheet, and statement of basis.
- Substantiating permit decisions and providing a sound basis for the derivation of permit terms, conditions, and limitations if challenges are made.
- Establishing a permanent record of the basis of the permit for use in future permit actions.

Exhibit 11-2 presents reasons for good documentation in the permit file and fact sheet.

Exhibit 11-2 Reasons for good documentation

- Streamlines the permit reissuance/ compliance monitoring process
- Establishes a permanent record of the basis for the permit
- Explains the legal and technical basis of the permit
- Provides a sound basis for future modifications and permits
- Requires the permit writer to be organized and logical throughout permit development process

Exhibits 11-3 and 11-4 provide flow diagrams of the NPDES permit administrative process. In general, the administrative process includes the following:

- Documenting all permit decisions.
- Coordinating EPA and state review of the draft (or proposed) permit.
- Providing public notice, conducting hearings (if appropriate), and responding to public comments.
- Defending the permit and modifying it (if necessary) after issuance.

Note that Exhibit 11-3 provides the general framework for the administrative process where EPA is the NPDES permitting authority and Exhibit 11-4 provides a typical framework for the administrative process where a state is the permitting authority. State requirements need not be identical to federal regulatory requirements, provided they are at least as stringent. Some authorized states have slightly different processes for developing and issuing NPDES permits. The same holds true for the appeal process. This manual presents EPA's procedure; state procedures for NPDES permit hearings and appeals vary according to state law.

Exhibit 11-3 Administrative process for EPA-issued NPDES permits

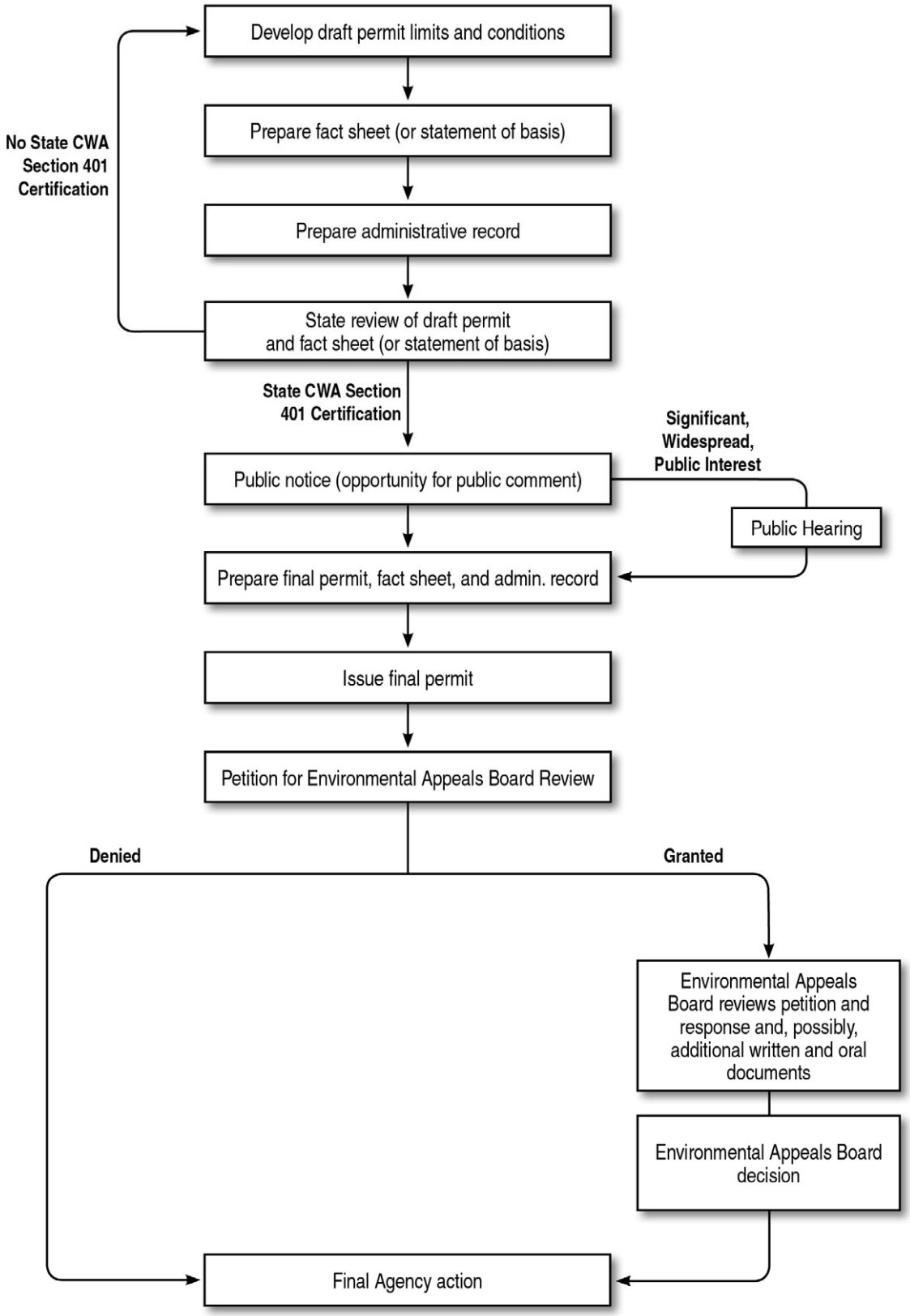
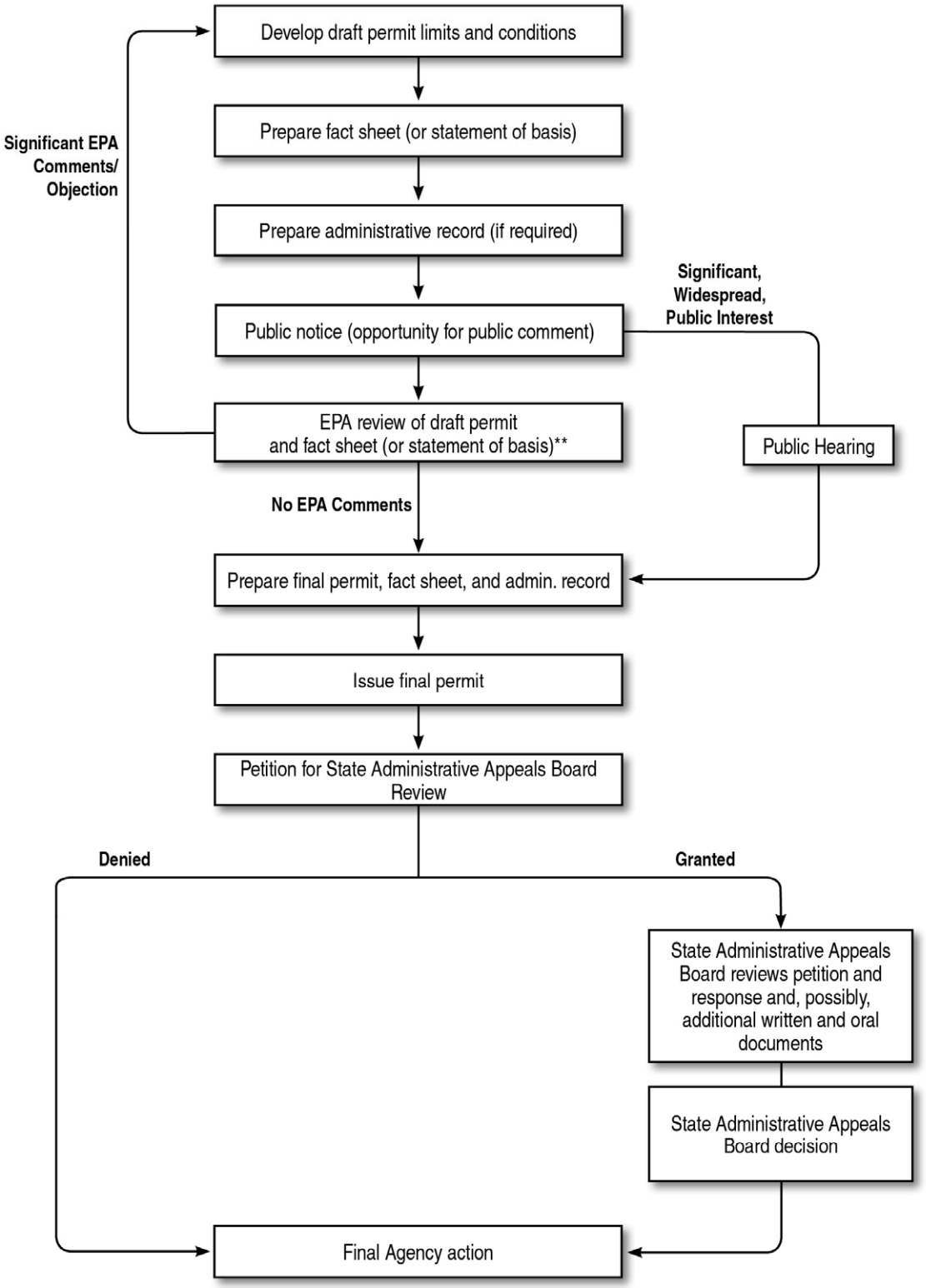


Exhibit 11-4 Typical administrative process for state-issued NPDES permits*



* State statutes and regulations govern the specific steps of the state administrative process, which may differ from the process outlined in this exhibit.
** Under State/EPA MOA, EPA may review draft or proposed permit.

11.2.1 Administrative Record

The administrative record should be considered the foundation that supports the NPDES permit. If EPA issues the permit, the contents of the administrative record are prescribed by regulation, with § 124.9 identifying the required content of the administrative record for a draft permit and § 124.18 describing the requirements for final permits. Regardless of whether a state or EPA issues the permit, all supporting materials must be made available to the public at any time and may be examined during the public comment period and any subsequent public hearing. The importance of maintaining the permit records in a neat, orderly, complete, and retrievable form cannot be over emphasized. The record allows personnel from the permitting agency to reconstruct the justification for a given permit and defend the permit during any legal proceedings regarding the permit.

The administrative record for a draft permit consists, at a minimum, of the specific documents shown in Exhibit 11-5. Materials that are readily available in the permit issuing office or published material that is generally available do not need to be physically included with the record as long as they are specifically referred to in the fact sheet or statement of basis. If EPA issues a draft permit for a new source, the administrative record should include any EISs or *Environmental Assessments* (EAs) performed in accordance with § 122.29(c).

Exhibit 11-5 Elements of the administrative records for a draft permit

- Permit application and supporting data
- Draft permit
- Statement of basis or fact sheet
- All items cited in the statement of basis or fact sheet, including calculations used to derive the permit limitations
- Meeting reports
- Correspondence with the applicant and regulatory personnel
- All other items in the supporting file
- For new sources, any EA, draft/final EIS, or other such background information, such as a Finding of No Significant Impact (only applies if EPA issues the permit)

The administrative record should include all meeting reports and correspondence with the applicant and other regulatory agency personnel, trip reports, and records of telephone conversations. All correspondence, notes, and calculations should be dated and indicate the name of the writer and all other persons involved. Because correspondence is subject to public scrutiny, references or comments that do not serve an objective purpose should be avoided. Finally, the presentation of calculations and documentation of decisions should be organized in such a way that they can be reconstructed and the logic supporting the calculation or decisions can easily be found.

11.2.2 Fact Sheets and Statements of Basis

A fact sheet is a document that briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. When the permit is in the draft stage, the fact sheet and supporting documentation serve to explain the rationale and assumptions used in deriving the limitations to the discharger, the public, and other interested parties.

The NPDES regulations at § 124.8(a) stipulate that every EPA and state-issued permit must be accompanied by a fact sheet if the permit

- Involves a major facility or activity.
- Incorporates a variance or requires an explanation under § 124.56(b) (toxic pollutants, internal waste stream, and indicator pollutants and for privately owned waste treatment facilities).
- Is an NPDES general permit.
- Is subject to widespread public interest.
- Is a Class I sludge management facility.
- Includes a sewage sludge land application plan.

A well-documented rationale for all permit decisions reduces the work necessary to reissue a permit by eliminating conjecture concerning the development of those permit conditions that are being carried forward to the next permit. That is also true if a modification is initiated during the life of the permit. The required contents of a fact sheet, as specified in §§ 124.8 and 124.56, are listed in Exhibit 11-6.

Exhibit 11-6 Required elements of a fact sheet

Required element	Regulatory citation (40 CFR)
General facility information • Description of the facility or activity • Sketches or a detailed description of the discharge location • Type and quantity of waste/pollutants discharged	 § 124.8 § 124.56 § 124.8
Summary rationale of permit conditions • Summary of the basis for the draft permit conditions • References to the applicable statutory or regulatory provisions • References to the administrative record	§ 124.8
Detailed rationale of permit conditions • Explanation and calculation of effluent limitations and conditions • Specific explanations of – Toxic pollutant limitations – Limitations on internal wastestreams – Limitations on indicator pollutants – Case-by-case requirements – Decisions to regulate non-publicly owned treatment works (POTWs) under a separate permit • For EPA-issued permits, the requirements of any state certification • For permits with a sewage sludge land application plan, a description of how all required elements of the land application plan are addressed in the permit • Reasons why any requested variances do not appear justified, if applicable	 § 124.56 § 124.8
Administrative Requirements • A description of the procedures for reaching a final decision on the draft permit, including – Public comment period beginning and ending dates – Procedures for requesting a hearing – Other procedures for public participation • Name and telephone number of the person to contact for additional information	 § 124.8

The fact sheet should include detailed discussions of the development of permit limitations for each pollutant, including the following:

- Calculations and assumptions related to production and flow.
- Type of limitations (i.e., limitations based on secondary treatment standards, effluent limitations guidelines and standards (effluent guidelines), case-by-case determinations, or water quality standards).
- Whether the effluent guidelines used were Best Practicable Control Technology Currently Available (BPT), Best Available Technology Economically Achievable (BAT), Best Conventional Pollutant Control Technology (BCT), or New Source Performance Standards (NSPS).
- The water quality standards or criteria used.
- Whether any parameters were used as indicators for other pollutants.
- Citations to appropriate wasteload allocation or total maximum daily load studies, guidance documents, other references.

Often, decisions to include certain requirements lead to a decision to exclude other requirements. It is just as important to keep a thorough record of items that were not included in the draft permit as it is to keep a record of included items. Such records might include the following:

- Why were secondary treatment standards, case-by-case determinations, or effluent guidelines used as the basis for final effluent limitations rather than water quality standards (i.e., demonstrate that the limitations checked to see that water quality standards would be attained)?
- Why was biomonitoring not included?
- Why were pollutants that were reported as present in the permit application not specifically limited in the permit?
- Why is a previously limited pollutant no longer limited in the draft permit?

Finally, the fact sheet should address the logistics of the permit issuance process, including the beginning and ending dates of the public comment period, procedures for requesting a hearing, and other means of public involvement in the final decision.

A statement of basis, as described in § 124.7, is required for EPA-issued permits that are not required to have a fact sheet. A statement of basis describes the derivation of the effluent limitations and the reasons for special conditions. However, a prudent permit writer will develop the detailed rationale required in a fact sheet for any permit that includes complex calculations or special conditions (e.g., case-by-case effluent limitations based on best professional judgment [BPJ]) even if a fact sheet is not required by regulation.

11.3 Items to Address before Issuing a Final Permit

This section describes the public participation activities that must be conducted in the permit issuance process. These include providing public notices, collecting and responding to public comments, and holding public hearings as necessary.

11.3.1 Public Notice

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or other significant actions with respect to an NPDES permit or permit application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to NPDES permits. The exact scope, required contents, and methods for effecting public notices are found in § 124.10. The NPDES permit-related actions for which public notice is required are shown in Exhibit 11-7.

Exhibit 11-7 Actions for which public notice is required

- Tentative denial of an NPDES permit application (not necessarily applicable to state programs)
- Preparation of a draft NPDES permit, including a proposal to terminate a permit
- Scheduling of a public hearing
- An appeal has been granted by the Environmental Appeals Board
- Major permit modifications (after permit issuance)
- New Source determinations (EPA only)

The permit writer should be particularly concerned with the first three items in Exhibit 11-7. It is important to note that no public notice is required when a request for a permit modification, revocation, reissuance, or termination is denied.

Public notice of NPDES permit-related activities should be provided using the following methods:

- For major permits, publication of a notice in daily or weekly newspaper within the area affected by the facility or activity.
- For general permits issued by EPA, publication in the FR.
- For all permits, direct mailing to various interested parties. This mailing list should include the following:
  - The applicant.
  - Any interested parties on the mailing list.
  - Any other agency that has issued or is required to issue a Resource Conservation and Recovery Act (RCRA), Underground Injection Control (UIC), Prevention of Significant Deterioration (PSD) (or other permit under the Clean Air Act), NPDES, CWA section 404, sludge management, or ocean dumping permit under the Marine Research Protection and Sanctuaries Act for the same facility or activity.
  - Federal and state agencies with jurisdiction over fish, shellfish, and wildlife resources and over coastal zone management plans, the Advisory Council on Historic Preservation, State Historic Preservation Officers, including any affected states and tribes.
  - State agencies conducting area-wide and continuing planning under CWA sections 208(b)(2), 208(b)(4) or 303(e) and the FWS, NMFS, and the U.S. Army Corps of Engineers.
  - Users identified in the permit application of a privately owned treatment work.
  - Persons on any mailing lists developed by including those who request inclusion in writing and persons solicited for *area lists* from participants in past permit proceedings in the area.
  - Any local government having jurisdiction over the locality of the facility.

A public notice must contain the information shown in Exhibit 11-8.

Exhibit 11-8 Contents of the public notice

- Name and address of the office processing the permit action
- Name and address of the permittee or applicant and, if different, of the facility or activity regulated by the permit
- A brief description of the business conducted at the facility or activity described in the permit
- Name, address, and telephone number of a contact from whom interested persons can obtain additional information
- A brief description of the comment procedures required, the time and place of any hearing to be held including procedures to request a hearing
- For EPA-issued permits, the location and availability of the administrative record and the times at which the record will be open for public inspection and a statement that all data submitted by the applicant is available as part of the administrative record
- A description of the location of each existing or proposed discharge point and the name of the receiving water and the sludge use and disposal practice(s) and the location of each sludge treatment works treating domestic sewage and use or disposal sites known at the time of permit application
- Requirements applicable to a thermal variance under CWA section 316(a)
- Requirements applicable to cooling water intake structures under CWA section 316(b)
- Any additional information considered necessary

The regulatory agency preparing the permit must provide public notice of the draft permit (including a notice of intent to deny a permit application), and it must provide at least 30 days for public comment. The draft permit is usually submitted for public notice after it has undergone internal review by the regulatory agency that is issuing the permit. State-issued permits typically undergo public notice after EPA has reviewed and commented on the draft permit. In the special case of those EPA-issued permits that require an EIS, public notice is not given until after a draft EIS is issued.

11.3.2 Public Comments

Public notice of a draft permit might elicit comments from concerned individuals or agencies. Frequently, such comments are simply requests for additional information. However, some comments are of a substantive nature and suggest modifications to the draft permit or indicate that the draft permit is inappropriate for various reasons. In such cases, commenters must submit all reasonable arguments and factual material in support of their positions and comments by the close of the public comment period, and the permitting authority must consider those comments in making final decisions. If the approach is technically correct and clearly stated in the fact sheet, it will be difficult for commenters to find fault with the permit. Commenters can always suggest alternatives, however. In addition, an interested party may also request a public hearing.

To the extent possible, it is desirable to respond to all public comments as quickly as possible. In some cases, it might be possible to diffuse a potentially controversial situation by providing further explanation of permit terms and conditions. Additionally, permit writers should also consider notifying commenters that their comments have been received and are being considered.

The permitting agency must respond to all significant comments, in accordance with § 124.17, at the time a final permit decision is reached (in the case of EPA-issued permits) or at the same time a final permit is

actually issued (in the case of state-issued permits). The response should incorporate the following elements:

- Changes in any of the provisions of the draft permit and the reasons for the changes.
- Description and response to all significant comments on the draft permit or the permit application raised during the public comment period or during any hearing.

If any information is submitted during the public comment period raises substantial new questions about the draft permit, one of the following actions can occur:

- A new draft permit with a revised fact sheet or statement of basis is prepared.
- A revised statement of basis, a fact sheet, or revised fact sheet is prepared, and the comment period is reopened.
- The comment period is reopened but is limited to new findings only.

If any of those actions is taken, a new public notice, as described earlier, must be given.

For EPA-issued permits, any documents cited in the response to comments must be included in the administrative record. If new points are raised or new material is supplied during the public comment period, EPA may document its response to these new materials by adding new materials to the administrative record.

11.3.3 Public Hearings

Any interested party may request a public hearing. The request should be in writing and should state the nature of the issues proposed to be raised during the hearing. However, a request for a hearing does not automatically necessitate that a hearing be held. A public hearing should be held when there is a significant amount of interest expressed during the public comment period or when it is necessary to clarify the issues involved in the permit decision.

Thus, the decision of whether to hold a public hearing is actually a judgment call. Such decisions are usually made by someone other than the permit writer. However, the permit writer will be responsible for ensuring that all the factual information in support of the draft permit is well documented.

Public notice of a public hearing must be given at least 30 days before the public meeting. Public notice of the hearing may be given at the same time as public notice of the draft permit, and the two notices may be combined. The public notice of the hearing should contain the following information:

- Brief description of the nature and purpose of the hearing, including the applicable rules and procedures.
- Reference to the dates of any other public notices relating to the permit.
- Date, time, and place of the hearing.

Scheduling a hearing automatically extends the comment period until at least the close of the hearing [§ 124.12(c)] and the public comment period may be extended by request during the hearing. Anyone may submit written or oral comments concerning the draft permit at the hearing. A presiding officer is responsible for scheduling the hearing and maintaining orderly conduct, including setting reasonable time

limitations for oral statements. Note that a transcript or recording of the hearing must be available to interested persons.

11.3.4 Environmental Justice Considerations

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across U.S. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

In NPDES permits, the public participation process provides opportunities to address EJ concerns by providing appropriate avenues for public participation, seeking out and facilitating involvement of those potentially affected, and including public notices in more than one language where appropriate.

11.3.5 EPA and State/Tribal Roles in Reviewing Draft Permits

The CWA and the NPDES regulations include review roles for EPA and for states, tribes, and territories (states) depending on whether EPA or a state is issuing an NPDES permit.

11.3.5.1 State-issued Permits

Each authorized state administering an NPDES program must transmit to the EPA Region copies of permit applications received and copies of draft or proposed permits [§ 123.43(a)]. The state and the EPA Region execute a Memorandum of Agreement (MOA) under § 123.24 that addresses administration and enforcement of the state's regulatory program. The MOA may specify that EPA will review draft permits rather than proposed permits [§ 123.44(j)] and specify the classes or categories of permit applications and draft or proposed permits that the state will send to the EPA Region for review, comment, and, where applicable, objection. In addition, the MOA specifies classes or categories of permits for which EPA will waive its right to review the draft or proposed permit. EPA cannot waive its right to review classes or categories of permits for the following:

- Discharges into the territorial seas.
- Discharges that could affect waters of a state other than the one in which the discharge originates.
- Discharges proposed to be regulated by general permits.
- Discharges from a POTW with a daily average discharge exceeding 1 million gallons per day.
- Discharges of uncontaminated cooling water with a daily average discharge exceeding 500 million gallons per day.
- Discharges from any major discharger or from any NPDES primary industry category.
- Discharges from other sources with a daily average discharge exceeding 500,000 gallons per day (however, EPA may waive review for non-process wastewater).

The MOA provides a period up to 90 days from receipt of a permit during which the EPA Region can make general comments on, objections to, or recommendations with respect to the permit. If the EPA

Region objects to a permit, within 90 days of receiving the permit it must transmit to the state a statement of the reasons for the objection and the actions that the state must take to eliminate the objection [§ 123.44(a)-(b)]. Specific causes for objection are outlined in the regulations at § 123.44(c). Any interested party can request a public hearing on an objection by the EPA Region. After such a hearing, the Region can affirm the objection, modify the terms of the objection, or withdraw the objection and notify the state of that decision. If the EPA Region does not withdraw the objection, the state then has 30 days to resubmit a permit revised to meet the objection. If the state does not do so, exclusive authority to issue the permit passes to the EPA Region. If no public hearing on the objection is held, the time frame for the state to resubmit a revised permit is 90 days from receipt of the objection.

11.3.5.2 EPA-issued Permits

Permits issued by EPA require an opportunity for state review and certification under CWA section 401. The state in which a discharge originates or will originate is provided the opportunity to review an application or a draft permit and certify that the discharge will comply with the applicable water quality standards. This process also has the benefits of ensuring that state initiatives or policies are addressed in EPA-issued NPDES permits and promoting consistency between state-issued and EPA-issued permits where not all permits within the state are issued by the same agency.

Regulations at §§ 124.53 (State Certification) and 124.54 (Special provisions for state certification and concurrence on applications for CWA section 301(h) variances) describe procedures an EPA permit writer should follow to obtain state certification. Under CWA section 401(a)(1), EPA may not issue a permit until a certification is granted or waived. If EPA is preparing the draft permit, state certification can be accomplished by allowing states to review and certify the application before draft permit preparation. Under § 124.53, if EPA has not received a state certification by the time the draft permit is prepared, EPA must send the state a copy of the draft permit along with a notice requesting state certification.

If the state does not respond within a specified reasonable time, which cannot exceed 60 days, it is deemed to have waived its right to certify. If the state chooses to certify the draft permit, it may include any conditions more stringent than those in the draft permit necessary to ensure compliance with the applicable provisions of the CWA or state law, and must cite the CWA or state law references that support the changes. In addition, the state is required to include a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of state law, including water quality standards. Failure to provide this statement for any condition waives the right to certify or object to any less stringent condition that might be established during the EPA permit issuance process. When a permit applicant requests a CWA section 301(h) variance (§ 124.54), the state certification process is very similar to the process described above. For more on CWA section 301(h) variances, see section 5.1.3.5 of this manual.

11.3.6 Schedule for Final Permit Issuance

The final permit may be issued after the close of the public notice period and after state certification has been received (for permits issued by EPA). The public notice period consists of the following:

- A 30-day period that gives notice of intent to issue or deny the permit.
- A 30-day period advertising a public hearing (if applicable).
- Any extensions or reopening of the comment period.

Final EPA permit decisions are effective immediately upon issuance unless comment were received on the draft permit, in which case, the effective date of the permit is 30 days after issuance (or a later date if specified in the permit). In addition, permit decisions will not be immediately effective if review is requested on the permit under § 124.19. As discussed earlier, any comments that are received must be answered at the time of final permit issuance (in the case of NPDES states or tribes) or after a final decision is reached (in the case of EPA). The administrative record for the final permit consists of the items in Exhibit 11-9.

Exhibit 11-9 Elements of the administrative records for a final permit

- All elements for the draft permit administrative record (see Exhibit 11-5)
- All comments received during the comment period
- The tape or transcript of any public hearing
- Any materials submitted at a hearing
- Responses to comments
- For NPDES new source permits, the draft or final EIS
- The final permit

11.4 Administrative Actions after Final Permit Issuance

Once the final permit has been issued, the issuing authority should enter the permit limitations and any special conditions into the Integrated Compliance Information System for the NPDES program (ICIS-NPDES) (for more on ICIS-NPDES, see the introduction to this manual and section 11.5.1.1 below). Entering permit information into ICIS-NPDES will ensure that the facility's performance will be tracked and the permitting agency will be alerted to the need for corrective action if violations of permit limitations, terms, or conditions occur.

After final permit issuance, interested parties have opportunities to change the permit through permit appeals, major/minor permit modifications, termination and revocation, or transfer. Those administrative procedures are described below.

11.4.1 Permit Appeals

Throughout the process of developing a permit and during the public notice period, the permit writer should carefully consider all legitimate concerns of the applicant/permittee and any other interested party. Nevertheless, there will inevitably be situations in which a permit is issued in spite of the objections of the permittee or a third party. In such instances, the permittee or interested party can choose to legally contest or appeal the NPDES permit, as provided in § 124.19. Permit appeals are the process by which any person that filed comments on the draft permit may contest the final limitations and conditions in a permit.

Appeals of EPA-issued permits consist of petitioning the Environmental Appeals Board (EAB) for review. Such review must be requested within 30 days of issuance of the final permit, and challenges must be limited to issues raised during the draft permit's public comment or hearing processes, although persons not participating in these processes may seek review of changes in the permit from draft to final permit. During the appeals process, only those conditions of an existing permit that are being contested

are stayed. Within a reasonable time following the filing of the petition for review, the EAB must grant or deny the petition. Only individual permits may be appealed to the EAB; general permits may be challenged in court or an individual permit may be sought and appealed.

Many states have similar administrative appeal procedures designed to resolve challenges to the conditions of a permit. For the sake of convenience, such procedures, which could be known by different names (e.g., evidentiary hearing, administrative appeal), are hereafter *permit appeals*. Permit writers will, from time to time, be involved in permit appeals and will need to address the types of issues discussed below.

Aside from preparing the administrative record and notices, the permit writer might not be involved in the procedural matters relating to permit appeals. All requests for permit appeals are coordinated through the office of the EPA Regional Counsel or the appropriate state legal counsel. The permit writer's first involvement with the appeals process will likely come as a result of designation of the appeals staff, and his or her role will be limited to that of a technical advisor to legal counsel and, where a state uses an evidentiary hearing procedure, possibly a witness.

11.4.1.1 Deposition and Testimony

In a state hearing procedure, a permit writer might be required to give a deposition during which the appellant attorney conducts the questioning that would otherwise occur in the hearing. The deposition is transcribed and presented as evidence. The appellant attorney may ask some of the same questions at the hearing.

To prepare for a deposition and testimony, the permit writer should first consult with his or her general counsel to become familiar with laws, regulations, and policies that could affect the permit. The permit writer should also be thoroughly familiar with the technical basis for the permit conditions. For example, if final effluent limitations are based on water quality standards, the permit writer should thoroughly study the applicable water quality standards, water quality models, and procedures used to develop the effluent limitations and be prepared to defend all assumptions and decisions made in the effluent limitation calculations. For case-by-case limitations based on BPJ, the permit writer should carefully review all applicable data and procedures used to calculate the effluent limitations and should be sure that the information on which case-by-case limitations are based is unimpeachable, the limitations were derived from the data in a logical manner in accordance with established procedures, and the limitations are technically sound and meet applicable standards for economic reasonableness.

A permit appeal before the EAB relies on the information presented in the petitions and briefs, and possibly includes oral argument, but typically does not use depositions and direct testimony.

11.4.1.2 The Permit Writer's Role in the Appeals Process

As technical advisor to legal counsel, the permit writer's most important function is to develop support for contested permit conditions. A permit writer should not attempt to support technically indefensible conditions. Contested permit conditions that are not technically defensible and are not based on any legal requirement should be brought to counsel's attention, with advice that EPA or the state withdraw those conditions.

The second most important advisory function of the permit writer is assisting counsel in identifying weaknesses in the appellant's arguments. That process could include developing questions for cross-examination of opposing witnesses in a state permit appeal that involves a hearing. Questions should be restricted to the subject material covered by the witness' direct testimony and should be designed to elicit an affirmative or negative response, rather than an essay-type response.

Finally, the permit writer should remember that when a person petitions for EAB review or requests a hearing for a state-issued permit, the permit writer should refrain from any discussion about the case without first consulting with legal counsel.

In the role of technical advisor or witness, the permit writer should do the following:

- Cultivate credibility.
- Never imply or admit weakness in his or her area of expertise.
- Never attempt to testify about subjects outside his or her area of expertise.
- Always maintain good communication with counsel.

The EAB generally will attempt to resolve permit appeals in the initial stage of granting review. If that is not possible, the EAB conducts formal review of the contested conditions and publishes a written opinion (an Environmental Administrative Decision). The result of an EAB or state permit appeal might be relief from certain permit conditions, validation or strengthening of contested permit conditions, or a combination of these two outcomes. Under certain circumstances, decisions of the EAB can be appealed in federal court. Authorized state's permit appeal procedures typically provide for further appeal of administrative decisions regarding contested permit conditions in state court when all administrative steps have been fulfilled.

11.4.2 Modification or Revocation and Reissuance of Permits

In most cases, a permit will not need to be modified (or revoked and reissued) during the term of the permit if the facility can fully comply with permit conditions. However, under certain circumstances, it might be necessary to modify the permit before its expiration date. A permit modification could be triggered in several ways. For example, a representative of the regulatory agency might inspect the facility and identify a need for the modification (i.e., the improper classification of an industry), or information submitted by the permittee might suggest the need for a change. Of course, any interested person may make a request for a permit modification.

Modifications differ from revocations and reissuance. In a permit modification, only the conditions subject to change are reconsidered while all other permit conditions remain in effect. Conversely, the entire permit could be reconsidered when it is revoked and reissued.

Except where the permittee requests or agrees, permit modifications are limited to specific *causes* identified in §§ 122.62(a) and 122.62(b) and summarized in Exhibit 11-10. Most NPDES permit modifications require EPA or the state to conduct the public notice and participation activities of Part 124, similar to the issuance or reissuance of the permit; however, only those specific conditions being modified are open to review and comment. The permitting authority may revoke and reissue a permit during its term for the causes identified in § 122.62(b) (i.e., the final two bulleted items in Exhibit 11-10).

Exhibit 11-10 Causes for permit modification

- **Alterations**: When there are material and substantial alterations or changes to the permitted facility or activity occur that justify new conditions that are different from the existing permit.
- **New information**: When information is received that was not available at the time of permit issuance.
- **New regulations**: Under limited circumstances, when standards or regulations on which the permit was based have been changed by the modification, withdrawal or promulgation of amended standards or regulations or by judicial decision.
- **Compliance schedules**: To modify the compliance schedule when good cause exists, such as an act of God, strike, or flood.
- **Variance requests**: When requests for variances or fundamentally different factors are filed within the specified time but not granted until after permit issuance.
- **Toxics**: To insert CWA section 307(a) toxic effluent standard or prohibition.
- **Reopener**: Conditions in the permit that require it to be reopened under certain circumstances.
- **Net limits**: Upon request of a permittee who qualifies for effluent limitations on a net basis under § 122.45(g) or when a permittee is no longer eligible for net limitations, as provided in § 122.45(g)(1)(ii).
- **Pretreatment**: As necessary under § 403.8 (e) to put a compliance schedule in place for the development of a pretreatment program or to change the schedule for program development.
- **Failure to notify**: Upon failure of an approved state to notify another state whose waters may be affected by a discharge from the approved state.
- **Non-limited pollutants**: When the level of any pollutant that is not limited in the permit exceeds the level that can be achieved by the technology-based treatment requirements appropriate to the permit.
- **Notification levels**: To establish notification levels for toxic pollutants as provided in §122.44(f).
- **Compliance schedules for innovative or alternative facilities**: To modify the compliance schedule in light of the additional time that might be required to construct such a facility.
- **Small municipal separate storm sewer system (MS4) minimum control measures**: For a small MS4 to include required minimum control measures when the permit does not include such measure(s) based on the determination that another entity was responsible for implementation and the other entity fails to fulfill its responsibility to implement such measure(s).
- **Technical mistakes**: To correct technical mistakes or mistaken interpretations of law made in developing the permit conditions.
- **Failed BPJ compliance**: When BPJ technology is installed and properly operated and maintained but the permittee is unable to meet its limitations, the limitations may be reduced to reflect actual removal; however, they may not be less than the limitations in the effluent guidelines. If BPJ operation and maintenance costs are extremely disproportionate to the costs considered in a subsequent effluent guideline, the permittee may be allowed to backslide to the limitations in the effluent guideline.
- **Land application plans**: When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
- **Cause exists for termination**: Cause exists under § 122.64, and the Director determines that modification is appropriate.
- **Notification of proposed transfer**: Director may modify the permit upon receipt of ownership transfer notification.

There are certain minor modifications that, upon consent of the permittee, may be processed by the permitting authority without following the procedures for public notice in Part 124. Minor modifications are generally non-substantive changes (e.g., typographical errors) and are exempt from the administrative procedures; that is, a draft permit and public review are not required. The specific permit changes that can be processed as minor modifications, described in § 122.63, are to

- Correct typographical errors.
- Incorporate more frequent monitoring or reporting.
- Revise an interim compliance date in the schedule of compliance, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with attainment of the final compliance date requirement.
- Allow for a change of ownership, provided no other change is necessary (see section 11.4.4 below).
- Change the construction schedule for a new source discharger.
- Delete a point source outfall when that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.
- Incorporate an approved local pretreatment program.

11.4.3 Permit Termination

Situations could arise during the life of the permit that are causes for termination of the permit. Such circumstances, described in § 122.64(a), include the following:

- Noncompliance by the permittee with any condition of the permit.
- Misrepresentation or omission of relevant facts by the permittee.
- Determination that the permitted activity endangers human health or the environment, and can be regulated to acceptable levels only by permit modification or termination.
- A change in any condition that requires either a temporary or permanent reduction or elimination of a discharge (e.g., plant closure).

Terminations are used to retract a permittee's privileges to discharge during the permit term. A notice of intent to terminate a permit is a type of draft permit that follows the same procedures as any draft permit prepared under § 124.6. Administrative procedures, such as public notice, must be followed in permit termination proceedings. If a facility with a terminated permit wishes to obtain permit coverage, it would have to submit an application and apply for a new permit.

The regulations at § 122.64(b) do provide one exception to the more formal permit termination process described above. Where the entire discharge is permanently terminated by elimination of the flow or by connection to a POTW (but not by land application or disposal into a well) the permit can be terminated by notice to the permittee, and the Part 124 administrative process is not required. However, if the permittee objects to such an expedited termination, the Permitting Authority must then proceed in accordance with the administrative procedures described above.

11.4.4 Permit Transfer

Regulatory agencies occasionally receive notification of a change in ownership of a facility covered by an NPDES permit. Such changes require that a permit be transferred by one of two provisions:

- **Transfer by modification or revocation**: The transfer may be made during the process of a major or minor permit modification. It may also be addressed by revoking and subsequently reissuing the permit.
- **Automatic transfer**: A permit may automatically be transferred to a new permittee if three conditions are met:
  - The current permittee notifies the Director 30 days in advance of the transfer date.
  - The notice includes a written agreement between the old and new owner that contains the specific date for transfer of permit responsibility, coverage, and liability between them.
  - The Director of the regulatory agency does not notify the old permittee and the proposed new permittee that the subject permit will be modified or revoked and reissued.

11.5 Permit Compliance and Enforcement

EPA's OECA is responsible for nationally managing EPA's compliance and enforcement programs for all media including the CWA and NPDES. EPA uses a mix of tools including compliance assistance, incentives, and monitoring and enforcement. EPA and state environmental agencies authorized to administer the NPDES program seek to achieve and maintain a high level of compliance with environmental laws and regulations. Enforcement provides a powerful incentive for NPDES permittees to comply, and the way in which an NPDES permit is written directly affects its enforceability. Each permit must be written clearly and unambiguously so that compliance can be tracked effectively and the permit can be enforced if violations occur.

The permit writer could become actively involved with the compliance monitoring and enforcement of the terms and conditions of the NPDES permits that he or she has written. The extent of the permit writer's involvement will usually depend on the organizational structure of the regulatory agency. Larger, centrally organized agencies typically have separate personnel responsible for enforcing the terms of NPDES permits. In other organizations, the individual who writes the permit will also be responsible for such enforcement activities as discharge monitoring report (DMR) tracking, facility inspections, and enforcement recommendations. If a civil judicial enforcement action occurs, the permit writer might be called on to testify regarding the specific requirements of the permit or its basis.

Regardless of a regulatory agency's organizational structure, the permit writer should have an appreciation for the various aspects of a meaningful NPDES compliance enforcement program. The following sections address compliance monitoring reviews and inspections and data in the national ICIS-NPDES (formerly the Permit Compliance System or PCS) database, which provides the basis for evaluating compliance. This section concludes with a brief description of the enforcement actions available to facilitate permit compliance. For more information about CWA enforcement, see OECA's Clean Water Act Enforcement Website <www.epa.gov/compliance/civil/cwa/index.html>.

11.5.1 Compliance Monitoring

Compliance monitoring is a broad term that includes all activities that federal or state regulatory agencies take to ascertain a permittee's compliance with the conditions specified in an NPDES permit. Compliance monitoring data collected as part of the NPDES program are used to evaluate compliance and support enforcement actions. The process includes receiving, reviewing, and entering data into the ICIS-NPDES database, conducting on-site inspections, identifying violators, and determining an appropriate response.

A primary function of the compliance monitoring program is to verify compliance with permit conditions, including effluent limitations and compliance schedules. Compliance verification is achieved through

- **Compliance review**: A review of all written reports and other material relating to the status of a permittee's compliance.
- **Compliance inspections**: Field-related regulatory activities (i.e., facility inspections, effluent sampling) to determine compliance.

11.5.1.1 Compliance Review

Compliance and enforcement personnel use two primary sources of information to carry out compliance reviews:

- Permit/compliance files.
- The ICIS-NPDES database.

Permit/compliance files include the permit, application, fact sheet, compliance schedule reports, compliance inspection reports, DMRs, enforcement actions, and correspondence (e.g., summaries of telephone calls, copies of warning letters). Compliance personnel periodically review that information and use it to determine if enforcement is necessary and, if so, what level of enforcement is appropriate.

The ICIS-NPDES database <https://icis.epa.gov/icis> is the national database for tracking compliance with NPDES requirements and is discussed further in this manual's introduction. Information in ICIS-NPDES includes facility and discharge characteristics, self-monitoring data, compliance schedules, permit conditions, inspections, and enforcement actions. Permittees are required to submit effluent monitoring data, and compliance and status information, via Compliance Schedule Reports and DMRs. EPA Regions and NPDES states enter such information into ICIS-NPDES and evaluate permittees on compliance with NPDES permit requirements. Inspection and enforcement information is collected and entered by Regions or authorized states or both. Quarterly, EPA reviews the ICIS-NPDES system data and generates a *quarterly noncompliance report* (QNCR) for all major facilities following the requirements of § 123.45.

ICIS-NPDES supports compliance and enforcement actions and assists EPA staff in evaluation and oversight of the NPDES program. The database also promotes national consistency and uniformity in permit and compliance evaluations. NPDES permits must be written so that compliance can be tracked using ICIS-NPDES. Situations might arise in which permit limitations and monitoring conditions are not initially compatible with ICIS-NPDES entry and tracking. In such cases, the permit writer should alert the state or EPA Regional staff responsible for entering ICIS-NPDES codes and work with them to resolve any coding issues. To assist ICIS-NPDES coders in accurately interpreting and entering the permit into ICIS-NPDES and to assist enforcement personnel in reviewing permittee's self-monitoring data and

reports in a timely manner, permit writers should follow the compliance inspection procedures discussed in the next section.

11.5.1.2 Compliance Inspections

Compliance inspections refer to all field-related regulatory activities conducted to determine permit compliance. Such field activities can include compliance evaluation inspections (non-sampling), sampling inspections, other specialized inspections, and remote sensing. Certain inspections, such as diagnostic inspections and performance audit inspections, aid the regulatory agency in evaluating the facility's problems in addition to providing information to support enforcement action. Biomonitoring inspections are specifically targeted at facilities with effluent suspected or identified as causing toxicity problems that threaten the ecological balance of the receiving waters.

Compliance inspections are undertaken to fulfill one or more of the following purposes:

- Establish a regulatory presence to deter noncompliance.
- Ensure that permit requirements are being met or determine if permit conditions are adequate.
- Check the completeness and accuracy of a permittee's performance and compliance records.
- Assess the adequacy of the permittee's self-monitoring and reporting program including on-site laboratory functions.
- Determine the progress or completion of corrective action.
- Obtain independent compliance data on a facility's discharge.
- Evaluate the permittee's operation and maintenance activities.
- Observe the status of construction required by the permit.

11.5.2 Quarterly Noncompliance Reports

EPA Regional offices and NPDES states are required by the regulations at § 123.45 to report quarterly on major facilities that are not in compliance with the terms and conditions of their permit or enforcement order (i.e., that meet the criteria for *reportable noncompliance* [RNC] for effluent limitation, schedules, and reporting violations).

The regulations in § 123.45 establish requirements for listing facility violations and resulting regulatory enforcement action on QNCRs. The regulation establishes reporting requirements for violations that meet specific, quantifiable reporting criteria, as well as for violations that are more difficult to quantify but are of sufficient concern to be considered reportable. The regulation also specifies the format that the reports must follow and the schedule for their submission.

Only major facilities that meet RNC criteria must be reported on the QNCR. RNC consists of several general types of violations as established in § 123.45:

- Effluent limitations
  - Monthly average effluent limitations (see below for more).
  - Other effluent limitations with water quality or health impacts.

- Schedule: Violations of compliance schedule milestones by 90 days or more.
- Reporting: Reports late by 30 days or more.

A violation of any monthly average limitation should be evaluated for magnitude by comparing the measured amount in the DMR to the product of the monthly average limitation times the Technical Review Criteria (TRC) for that pollutant or parameter. The TRC is 1.4 for Group I (conventional) pollutants and 1.2 for Group II (generally toxic) pollutants. Appendix A to Part 123 contains a list of pollutants in each Group. RNC includes violations of a given Group I or Group II pollutant or parameter that equals or exceeds the product of the TRC times the monthly average limitation for any 2 or more months during a 6-month reporting period. RNC also includes violations of a Group I or Group II parameter by any amount (not necessarily TRC times the limitation or greater) for 4 months during the 6-month reporting period.

A subset of instances of RNC that appear on the QNCR could be noted as *significant noncompliance* (SNC). This distinction is used solely for management accountability purposes as a means of tracking trends in compliance and evaluating the relative timeliness of enforcement response toward priority violations.

The definition of SNC is not regulatory and can change as the NPDES program evolves to encompass new enforcement priorities. For example, in September 1995, EPA revised the definition of SNC to include violations of non-monthly average permit limitations by major facilities. Many permits for NPDES major facilities lacked required monthly average limitations and, thus, were not evaluated for SNC violations and follow-up formal enforcement action. The new definition became effective as of October 1, 1996. EPA's SNC policy is described in the memorandum Revision of NPDES Significant Noncompliance (SNC) Criteria to Address Violations of Non-Monthly Average Limits[1] <www.epa.gov/compliance/resources/policies/civil/cwa/revisedsncmemo.pdf>.

Generally, the designation of SNC indicates a violation is of sufficient magnitude or duration or both to be considered among EPA's priorities for regulatory review or response. The categories of SNC are

- Effluent limitations: The effluent limitation SNC criteria are the same as for QNCR discussed above.
- Schedule: The schedule SNC criteria are the same as for QNCR discussed above.
- Reporting: The reporting SNC criteria are the same as for QNCR discussed above.
- Order requirements: Violation of requirements in administrative or judicial orders.

The instance of SNC is considered resolved when the SNC criteria are no longer met during the review period, or when the permittee formerly in SNC exhibits compliance for all 3 months of the most recent 3-month reporting period. A permittee with SNC violations under a compliance schedule that is meeting its deadlines for corrective actions is in *resolved pending* status.

Any major permittee that is listed on the QNCR for two consecutive 3-month reporting periods for the same instance of SNC (e.g., same outfall point, same parameter, same category of violation) is expected to return to compliance or to be addressed with an appropriate enforcement action before the reporting deadline for the second QNCR. If the facility is in SNC after the second QNCR, and no enforcement

action has been taken, the facility is placed on the Watch List. The Watch List is a management tool that identifies and tracks facilities with serious violations and no apparent formal enforcement response.

11.5.3 Enforcement

EPA's NPDES compliance and enforcement principles and recommendations are described in the NPDES Enforcement Management System (EMS)[2] <www.epa.gov/compliance/resources/policies/civil/cwa/emscwa-jensen-rpt.pdf>. By choosing an appropriate enforcement response to CWA violations, EPA tries to achieve several goals:

- Correction of the violation as soon as possible.
- Deterrence of future violations by the same permittee or other permittees.
- Equal treatment of the regulated community through use of a uniform approach to selecting enforcement responses (i.e., similar violations are treated similarly).
- Assessment of an appropriate penalty.
- Protection of human health and the environment.

Once a facility has been identified as having potential CWA violations, EPA or the NPDES state reviews the facility's compliance history. The review includes an assessment of the magnitude, frequency, and duration of violations. The permitting authority identifies significant violations and makes a determination of the appropriate enforcement response. CWA section 309 authorizes the Agency to bring civil or criminal action against facilities that discharge pollutants without a permit or discharge in violation of NPDES permit conditions and judicial penalties up to $32,500 per day per violation.

EPA Regions and authorized states have specific procedures for reviewing self-monitoring and inspection data and for deciding what type of enforcement action is warranted. EPA recommends an escalating response to continuing noncompliance. The range of enforcement responses includes the following:

- Informal action (e.g., *notice of violation* [NOV]).
- Formal action.
- Administrative compliance order.
- Administrative order with or without an administrative penalty order (up to $157,500).
- Civil judicial action that imposes injunctive relief seeking compliance or penalty or both.
- Criminal prosecution.

Considerations when making determinations on the level of the enforcement response include the following:

- The duration of the violation.
- The severity of the violation.
- The degree of economic benefit obtained through the violation.
- Compliance history and previous enforcement actions taken against the violator.
- The degree of culpability.
- The deterrent effect of the response on similarly situated permittees.

Equally important considerations may include fairness and equity, national consistency, and the integrity of the NPDES program.

Citizens can participate in the enforcement process in a number of ways. Under the Freedom of Information Act, citizens have the right to request certain facility-specific compliance information from EPA's ICIS-NPDES database. In addition, under NPDES regulations, interested citizens can intervene in any federal civil judicial action to enjoin any threatened or continuing violation of program requirements or permit conditions, and to recover civil penalties in court. Citizens also have the opportunity to review and comment on any proposed consent decree to resolve a state or federal civil judicial enforcement action.

CWA section 505 allows any citizen to begin a civil judicial enforcement action on his or her own behalf. In certain circumstances, citizens may not begin suit if EPA or the state is diligently prosecuting a civil or criminal judicial action or an administrative action to obtain a penalty under CWA section 309(g) or a comparable provision of state law. Citizens must also give EPA, the state, and the alleged violator 60 days' notice of the alleged violation before beginning a citizen suit.

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[1] Herman, S.A. 1995. *Revision of NPDES Significant Noncompliance (SNC) Criteria to Address Violations of Non-Monthly Average Limits.* U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance. Memorandum, September 21, 1995. <www.epa.gov/compliance/resources/policies/civil/cwa/revisedsncmemo.pdf>.

[2] U.S. Environmental Protection Agency. 1989. *The Enforcement Management System: National Pollutant Discharge Elimination System (Clean Water Act)*. EC-G-1998-11b. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/compliance/resources/policies/civil/cwa/emscwa-jensen-rpt.pdf>.

Appendix A. Acronyms, Abbreviations and Glossary

This appendix contains two tables for permit writers to more easily navigate through the acronyms and the terms that are mentioned throughout this manual. The first table, *Acronyms and Abbreviations*, provides the full text of the acronyms and abbreviations used throughout and indicates whether they are defined in the *Glossary* (the second table), which provides definitions of terms used in the Clean Water Act and NPDES permit program. It provides a reference to the source of the definitions, where available.

A.1 Acronyms and Abbreviations

Exhibit A-1 presents the abbreviations used in the *NPDES Permit Writers' Manual*.

Exhibit A-1 Acronyms and abbreviations

Acronym or abbreviation	Full phrase	Glossary
1Q10	1-day, 10-year Low Flow	
7Q10	7-day, 10-year Low Flow	
4AAP	4-Aminoantipyrine (used for detecting phenolic compounds colorimetrically)	
ACHP	Advisory Council on Historic Preservation	
ACR	Acute-to-Chronic Ratio	
AFO	Animal Feeding Operation	x
AML	Average Monthly Limitation	x
ASR	Alternative State Requirement	
AWL	Average Weekly Limitation	x
BA	Biological Assessment	
BAT	Best Available Technology Economically Achievable	x
BCT	Best Conventional Pollutant Control Technology	x
BE	Biological Evaluation	
BMP	Best Management Practice	x
BOD	Biochemical Oxygen Demand	x
BOD_5	5-day Biochemical Oxygen Demand	
BPJ	Best Professional Judgment	x
BPT	Best Practicable Control Technology Currently Available	x
CAAP	Concentrated Aquatic Animal Production	
CAFO	Concentrated Animal Feeding Operation	x
CBOD	Carbonaceous Biochemical Oxygen Demand	x
$CBOD_5$	5-day Carbonaceous Biochemical Oxygen Demand	
CEQ	Council on Environmental Quality	
CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act	
CFR	*Code of Federal Regulations*	x
cfs	Cubic Feet per Second	
CGP	Construction General Permit	
CMOM	Capacity, Management, Operation and Maintenance	

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
COD	Chemical Oxygen Demand	x
CSO	Combined Sewer Overflow	x
CSS	Combined Sewer System	x
CV	Coefficient of Variation	
CWA	Clean Water Act	x
CWIS	Cooling Water Intake Structure	
CZMA	Coastal Zone Management Act	
DMR	Discharge Monitoring Report	x
DWO	Dry Weather Overflow	
EA	Environmental Assessment	
EAB	Environmental Appeals Board	
EC	Effect Concentration	
EFH	Essential Fish Habitat	
EIS	Environmental Impact Statement	
ELG	Effluent Limitations Guidelines or Effluent Guidelines	x
EMS	Enforcement Management System	
eNOI	Electronic Notice of Intent	
EPA	U.S. Environmental Protection Agency	
ESA	Endangered Species Act	
FDF	Fundamentally Different Factors	x
FR	*Federal Register*	
FWCA	Fish and Wildlife Coordination Act	
FWPCA	Federal Water Pollution Control Act	
FWS	U.S. Fish and Wildlife Service	
GC/MS	Gas Chromatography/Mass Spectroscopy	
gpd	Gallons per Day	
HEM	Hexane Extractable Material	
IC	Inhibition Concentration	
ICIS	Integrated Compliance Information System	
I/I	Infiltration/Inflow	
LA	Load Allocation	
lbs/day	Pounds per Day	
LC_{50}	Lethal Concentration to 50% of test organisms	
LOEC	Lowest Observed Effect Concentration	
LTA	Long-Term Average	
LTCP	Long-Term Control Plan	
MDL	Method Detection Limit	x
MDL	Maximum Daily Effluent Limitation	x
MEP	Maximum Extent Practicable	
µg/L	Micrograms per Liter	
mg/L	Milligrams per Liter	
mgd	Million Gallons per Day	x
ML	Minimum Level	x

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
MOA	Memorandum of Agreement	
MS4	Municipal Separate Storm Sewer System	x
MSA	Magnuson-Stevens Act	
MSGP	Multi-Sector General Permit	
N/A	Not Applicable	
NAICS	North American Industrial Classification System	x
NEMI	National Environmental Methods Index	
NEPA	National Environmental Policy Act	
NHPA	National Historic Preservation Act	
NMC	Nine Minimum CSO Controls	
NMFS	National Marine Fisheries Service	
NMP	Nutrient Management Plan	
NOAA	National Oceanic and Atmospheric Administration	
NOEC	No Observable Effect Concentration	
NOI	Notice of Intent	
NOV	Notice of Violation	
NPDES	National Pollutant Discharge Elimination System	x
NRDC	Natural Resources Defense Council	
NSCEP	National Service Center for Environmental Publications	
NSPS	New Source Performance Standards	
NTIS	National Technical Information Service	
O&G	Oil and Grease	
OCPSF	Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category	
OECA	EPA Office of Enforcement and Compliance Assurance	
ONRW	Outstanding National Resources Waters	
OTIS	Online Tracking Information System	
OW	Office of Water	
OWRC	Office of Water Resource Center	
PCS	Permit Compliance System	
POTW	Publicly Owned Treatment Works	x
PSD	Prevention of Significant Deterioration	
PSES	Pretreatment Standards for Existing Sources	
PSNS	Pretreatment Standards for New Sources	
QNCR	Quarterly Noncompliance Report	
RAPP	Refuse Act Permit Program	
RCRA	Resource Conservation and Recovery Act	
RNC	Reportable Noncompliance	
SIC	Standard Industrial Classification	x
SIU	Significant Industrial User	x
SNC	Significant Noncompliance	
SOP	Standard Operating Procedure	
SPCC	Spill Prevention Control and Countermeasure	x
SS	Suspended Solids	x

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
SSO	Sanitary Sewer Overflow	x
STORET	EPA Storage and Retrieval Database	x
SWPPP	Stormwater Pollution Prevention Plan	
TBEL	Technology-Based Effluent Limit(s)	x
TCDF	Tetrachlorodibenzofuran	
TEC	Transportation Equipment Cleaning Point Source Category	
THC	Total Hydrocarbons	
TIE	Toxicity Identification Evaluation	
TMDL	Total Maximum Daily Load	x
TOC	Total Organic Carbon	x
TRC	Technical Review Criteria	
TRE	Toxicity Reduction Evaluation	x
TRI	Toxic Release Inventory	
TSD	Technical Support Document [for Water Quality-based Toxics Control]	
TSS	Total Suspended Solids	x
TTO	Total Toxic Organics	
TU	Toxic Units	
TUa	Toxic Units – Acute	
TUc	Toxic Units – Chronic	
TWTDS	Treatment Works Treating Domestic Sewage	x
UAA	Use Attainability Analysis	
UIC	Underground Injection Control	
U.S.C.	*United States Code*	
WET	Whole Effluent Toxicity	x
VGP	Vessel General Permit	
WLA	Waste Load Allocation	x
WPD	EPA Water Permits Division	
WQA	Water Quality Act of 1987	
WQBEL	Water Quality-Based Effluent Limit(s)	x
WQS	Water Quality Standard(s)	x
WSRA	Wild and Scenic Rivers Act	

A.2 Glossary

Exhibit A-2 includes definitions of terms used in the *NPDES Permit Writers' Manual*. For terms that have a definition in the federal regulations, that definition is included with an appropriate citation. The citations also indicate where this guidance manual has paraphrased or modified the regulatory definitions for consistency with the format of the glossary. For terms that do not have a regulatory definition, but that are defined in another published EPA document, the citation to the relevant EPA document is provided.

Note that the definitions provided in the Glossary do not constitute EPA's official use of terms and phrases for regulatory purposes, and nothing in this document should be construed to alter or supplant any

other federal document. Official terminology is in the laws and related regulations as published in such sources as the Congressional Record, *Federal Register*, and elsewhere.

Exhibit A-2 Glossary

Term	Definition	Citation
401(a) Certification	A requirement of CWA section 401(a) that all federally issued permits be certified by the state in which the discharge occurs. The state certifies that the proposed permit will comply with state water quality standards and other state requirements.	1996 U.S. EPA NPDES Permit Writers' Manual (1996 PWM) <www.epa.gov/npdes/pubs/owm0243.pdf>
Acute Effect	The effect of a stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect generally observed in 96 hours or less is typically considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.	1996 PWM
Animal Feeding Operation (AFO)	Lot or facility (other than an aquatic animal production facility) where the following conditions are met: • Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period. • Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.	§ 122.23(b)(1)
Anti-backsliding	In general, a statutory provision that prohibits the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards that are less stringent than those established in the previous permit. For more information on anti-backsliding, see Chapter 7 of this manual.	CWA section 402(o)
Antidegradation	A policy developed and adopted as part of a state's water quality standards that ensures protection of existing uses and maintains the existing level of water quality where that water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This policy also includes special protection of water designated as Outstanding National Resource Waters.	Adapted from 1996 PWM
Authorized Program or Authorized State	A state, territorial, tribal, or interstate NPDES program that has been approved or authorized by EPA under Part 123.	1996 PWM
Average Monthly Discharge Limitation	The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during that month divided by the number of daily discharges measured during that month.	§ 122.2
Average Weekly Discharge Limitation	The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.	§ 122.2
Best Available Technology Economically Achievable (BAT)	Technology standard established by the CWA as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. BAT limitations in effluent guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Best Conventional Pollutant Control Technology (BCT)	Technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, oil and grease. The BCT is established in light of a two-part cost reasonableness test, which compares the cost for an industry to reduce its pollutant discharge with the cost to a POTW for similar levels of reduction of a pollutant loading. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find limits which are reasonable under both tests before establishing them as BCT.	1996 PWM
Best Management Practice (BMP)	Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of *waters of the United States*. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.	§ 122.2
Best Practicable Control Technology Currently Available (BPT)	The first level of technology standards established by the CWA to control pollutants discharged to waters of the U.S. BPT limitations in effluent guidelines are generally based on the average of the best existing performance by plants within an industrial category or subcategory.	Adapted from 1996 PWM
Best Professional Judgment (BPJ)	The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.	1996 PWM
Bioassay	A test used to evaluate the relative potency of a chemical or a mixture of chemicals by comparing its effect on a living organism with the effect of a standard preparation on the same type of organism.	1996 PWM
Biochemical Oxygen Demand (BOD)	A measurement of the amount of oxygen used by the decomposition of organic material, over a specified time (usually 5 days) in a wastewater sample; it is used as a measurement of the readily decomposable organic content of a wastewater.	1996 PWM
Biosolids	See *Sewage Sludge*.	--
Bypass	The intentional diversion of waste streams from any portion of a treatment facility. This definition applies to both direct and indirect discharges.	§ 122.41(m)(1)(i) and § 403.17
Carbonaceous Biochemical Oxygen Demand (CBOD)	The biochemical oxygen demand of carbonaceous sources. This differs from BOD in that BOD measures both nitrogenous and carbonaceous sources, whereas CBOD excludes nitrogenous sources (e.g., nitrifying bacteria) from determination through the addition of a nitrification inhibitor.	--
Categorical Industrial User (CIU)	An industrial user subject to national categorical pretreatment standards.	1996 PWM
Categorical Pretreatment Standards	National pretreatment standards , expressed as Pretreatment Standards for Existing Sources (PSES) or Pretreatment Standards for New Sources (PSNS), specifying quantities or concentrations of pollutants or pollutant properties that may be discharged to a POTW by existing or new industrial users in specific industrial subcategories established as separate regulations under the appropriate subpart of 40 CFR chapter I, subchapter N.	Adapted from § 403.6

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Chemical Oxygen Demand (COD)	A measure of the oxygen-consuming capacity of inorganic and organic matter present in wastewater. COD is expressed as the amount of oxygen consumed in mg/L. Results do not necessarily correlate to the biochemical oxygen demand (BOD) because the chemical oxidant can react with substances that bacteria do not stabilize.	Adapted from 1996 PWM
Chronic Effect	The effect of a stimulus that lingers or continues for a relatively long period, often one-tenth of the life span or more. The measurement of a chronic effect can be reduced growth, reduced reproduction, and such, in addition to lethality.	1996 PWM
Clean Water Act (CWA)	The Clean Water Act is a statute passed by the U.S. Congress to control water pollution. It was formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), 33 U.S.C. 1251 *et seq.*, as amended by: Public Law 96-483; Public Law 97-117; Public Laws 95-217, 97-117, 97-440, and 100-04.	1996 PWM
Code of Federal Regulations (CFR)	A codification of the final rules published daily in the *Federal Register*. Title 40 of the CFR contains regulations for the protection of the environment.	1996 PWM
Combined Sewer Overflow (CSO)	A discharge of untreated wastewater from a combined sewer system at a point before the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt). During periods of wet weather, these systems become overloaded, bypass treatment works, and discharge directly to receiving waters at designed overflow points.	1996 PWM
Combined Sewer System (CSS)	A wastewater collection system that conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and stormwater through a single pipe to a publicly owned treatment works for treatment before discharge to surface waters.	1996 PWM
Compliance Schedule (or Schedule of Compliance)	A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the CWA and regulations.	§ 122.2
Composite Sample	Sample composed of two or more discrete aliquots (samples). The aggregate sample will reflect the average water quality of the compositing or sample period.	--
Conventional Pollutants	Pollutants typical of municipal sewage, and for which publicly owned treatment works typically are designed to remove; defined by Federal Regulation (§ 401.16) as BOD, TSS, fecal coliform bacteria, oil and grease, and pH.	1996 PWM
Daily Discharge	The *discharge of a pollutant* measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.	§ 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Designated Uses	Those uses specified in water quality standards for each waterbody or segment whether they are being attained (§ 131.3). Examples of designated uses include cold and warm water fisheries, public water supply, and irrigation.	Adapted from EPA. Terms of Environment: Glossary, Abbreviations, Acronyms. <www.epa.gov/OCEPAterms/dterms.html>
Development Document	A report prepared during development of an effluent guideline by EPA that provides the data and methodology used to develop effluent guidelines and categorical pretreatment standards for an industrial category.	Adapted from 1996 PWM
Director	The Regional Administrator or the State Director, as the context requires, or an authorized representative. When there is no *approved state program*, and there is an EPA-administered program, *Director* means the Regional Administrator. When there is an approved state program, Director normally means the State Director. In some circumstances, however, EPA retains the authority to take certain actions even when there is an approved state program. (For example, when EPA has issued an NPDES permit before the approval of a state program, EPA may retain jurisdiction over that permit after program approval, see § 123.1.) In such cases, Director means the Regional Administrator and not the State Director.	§ 122.2
Discharge Monitoring Report (DMR)	The EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by *approved states* as well as by EPA. EPA will supply DMRs to any approved state upon request. The EPA national forms may be modified to substitute the state agency name, address, logo, and other similar information, as appropriate, in place of EPA's.	§ 122.2
Draft Permit	A document prepared under § 124.6 indicating the Director's tentative decision to issue, deny, modify, revoke and reissue, terminate, or reissue a *permit.* A notice of intent to terminate a permit, and a notice of intent to deny a permit, as discussed in § 124.5, are types of *draft permits*. A denial of a request for modification, revocation and reissuance, or termination, as discussed in § 124.5, is not a draft permit. A *proposed permit* is not a draft permit.	§ 122.2
Effluent Limitation	Any restriction imposed by the Director on quantities, discharge rates, and concentrations of *pollutants* which are *discharged* from *point sources* into waters of the United States, the waters of the *contiguous zone*, or the ocean.	§ 122.2
Effluent Limitations Guidelines (Effluent Guidelines or ELG)	A regulation published by the Administrator under CWA section 304(b) to adopt or revise *effluent limitations*.	§ 122.2
Existing Uses	Those uses actually attained in the waterbody on or after November 28, 1975, whether they are included in the water quality standards.	§ 131.3

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Fact Sheet	A document that must be prepared for all draft individual permits for NPDES major dischargers, NPDES general permits, NPDES permits that contain variances, NPDES permits that contain sewage sludge land application plans and several other classes of dischargers. The document summarizes the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit and explains how the public may comment (§§ 124.8 and 124.56). Where a fact sheet is not required, a statement of basis must be prepared (§ 124.7).	1996 PWM
Fundamentally Different Factors (FDF)	Those components of a petitioner's facility that are determined to be so unlike those components considered by EPA during the effluent guidelines and pretreatment standards rulemaking that the facility is worthy of a variance from the effluent guidelines or categorical pretreatment standards that would otherwise apply.	Adapted from 1996 PWM
General Permit	An NPDES permit issued under § 122.28 that authorizes a category of discharges under the CWA within a geographical area. A general permit is not specifically tailored for an individual discharger.	1996 PWM
Grab Sample	A sample taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time.	Adapted from 1996 PWM
Hazardous Substance	Any substance—as designated under Part 116 pursuant to CWA section 311—that presents an imminent and substantial danger to the public health or welfare, including fish, shellfish, wildlife, shorelines, and beaches, upon discharge to navigable waters of the United States.	Adapted from § 122.2 and CWA section 311(b)(2)(A)
Indirect Discharger	A nondomestic discharger introducing *pollutants* to a publicly owned treatment works.	40 CFR 122.2
Instantaneous Maximum Limit	The maximum allowable concentration or other measure of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.	1996 PWM
Instantaneous Minimum Limit	The minimum allowable concentration or other measure of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.	--
Load Allocation	The portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loads should be distinguished.	§ 130.2
Local Limits	Where specific prohibitions or limits on pollutants or pollutant parameters are developed by a POTW in accordance with § 403.4(c), such limits must be deemed Pretreatment Standards for the purposes of CWA section 307(d).	Adapted from § 403.4(d)

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Major Facility	Any NPDES facility or activity classified as such by the Regional Administrator, or in the case of approved state programs, the Regional Administrator in conjunction with the State Director (§ 122.2). Major municipal dischargers include all facilities with design flows of greater than one million gallons per day and facilities with EPA/state approved industrial pretreatment programs. Major industrial facilities are determined based on specific ratings criteria developed by EPA or are classified as such by EPA in conjunction with the state.	1996 PWM
Method Detection Limit (MDL)	The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.	§ 136 - Appendix B
Maximum Daily Effluent Limitation (MDL)	The highest allowable daily discharge of a pollutant. (Chapter 6)	--
Million Gallons per Day (or mgd)	A unit of flow commonly used for wastewater discharges. One million gallon per day is equivalent to 1.547 cubic feet per second.	1996 PWM
Minimum Level (ML)	The level at which the entire analytical system must give a recognizable signal and acceptable calibration point. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.	§ 136 - Appendix A
Mixing Zone	An area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient waterbody. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented.	Technical Support Document for Water Quality-based Toxics Control <www.epa.gov/npdes/pubs/owm0264.pdf>
Municipal Separate Storm Sewer System (MS4)	A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): a. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under CWA section 208 that discharges to waters of the United States. b. Designed or used for collecting or conveying stormwater. c. [That] is not a combined sewer. d. [That] is not part of a Publicly Owned Treatment Works (POTW) as defined at § 122.2.	§ 122.26(b)(8)
Municipal Sludge	See *Sewage Sludge*.	--

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
National Pollutant Discharge Elimination System (NPDES)	The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under CWA sections 307, 318, 402, and 405. The term includes *approved program*. NPDES permits regulate discharges of pollutants from point sources to waters of the United States. Such discharges are illegal unless authorized by an NPDES permit.	Adapted from § 122.2
National Pretreatment Standard or Pretreatment Standard	Any regulation promulgated by EPA in accordance with CWA sections 307(b) and 307(c) that applies to a specific category of industrial users and provides limitations on the introduction of pollutants into publicly owned treatment works. The term includes the prohibited discharge standards under § 403.5.	Adapted from § 403.3(l)
New Discharger	Any building, structure, facility, or installation: a. From which there is or may be a discharge of pollutants. b. That did not begin the discharge of pollutants at that site before August 13, 1979. c. That is not a new source. d. That has never received a finally effective NPDES permit for discharges at that site. This definition includes an *indirect discharger* that begins discharging into waters of the United States after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a *site* for which it does not have a permit; and any offshore or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a site under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is in an area determined by the Regional Administrator in the issuance of a final permit to be an area or biological concern. In determining whether an area is an area of biological concern, the Regional Administrator must consider the factors specified in §§ 125.122(a)(1) - 125.122(a)(10). An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a *new discharger* only for the duration of its discharge in an area of biological concern.	Adapted from § 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
New Source	Any building, structure, facility, or installation from which there is or could be a discharge of pollutants, the construction of which commenced: a. After promulgation of standards of performance under CWA section 306, which are applicable to such source; or b. After proposal of standards of performance in accordance with CWA section 306, which are applicable to such source but only if the standards are promulgated in accordance with CWA section 306 within 120 days of their proposal. Additional Criteria: Except as otherwise provided in an applicable new source performance standard, a source is a *new source* if it meets the definition in § 122.2; and i. It is constructed at a site at which no other source is located; or ii. It totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or iii. Its processes are substantially independent of an existing source at the same site. In determining whether these processes are substantially independent, the Director shall consider such factors as the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source.	Adapted from § 122.2 and § 122.29(b)(1)
New Source Performance Standards (NSPS)	Technology standards for facilities that qualify as new sources under § 122.2 and § 122.29. Standards consider that the new source facility has an opportunity to design operations to more effectively control pollutant discharges.	1996 PWM
Nonconventional Pollutants	All pollutants that are not included in the list of conventional or toxic pollutants in Part 401. Includes pollutants such as chemical oxygen demand (COD), total organic carbon (TOC), nitrogen, and phosphorus.	1996 PWM
Nonpoint Source	Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater. Atmospheric deposition and hydromodification are also sources of nonpoint source pollution.	--
North American Industrial Classification System (NAICS)	The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.	Retrieved from <www.census.gov/epcd/www/naics.html>
Nutrients	Chemical elements and compounds found in the environment that plants and animals need to grow and survive. Nutrients include compounds of nitrogen (nitrate, nitrite, ammonia, organic nitrogen) and phosphorus (orthophosphate and others), both natural and man-made.	--
Permitting Authority	The agency authorized to issue and enforce specific requirements of the NPDES permit program. The permitting authority may be EPA, or a state, territorial, or tribal agency that has been authorized under CWA section 402(b) to administer the NPDES program within its jurisdiction.	--

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
pH	A measure of the hydrogen ion concentration of water or wastewater; expressed as the negative log of the hydrogen ion concentration in mg/L. A pH of 7 is neutral. A pH less than 7 is acidic, and a pH greater than 7 is basic.	1996 PWM
Point Source	Any discernible, confined, and discrete conveyance, including any pipe, ditch, channel, tunnel, conduit, well, discrete fixture, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. The term does not include return flows from irrigated agriculture or agricultural stormwater runoff.	Adapted from § 122.2
Pollutant	Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended [42 U.S.C. 2011 *et seq.*)], heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean a. Sewage from vessels. b. Water, gas, or other material that is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the state in which the well is located, and if the state determines that the injection or disposal will not result in the degradation of ground or surface water resources.	§ 122.2
Pollutant, Conservative	Pollutants that do not readily degrade in the environment and that are mitigated primarily by dilution after entering receiving waters (e.g., metals, total suspended solids).	Adapted from 1996 PWM
Pollutant, Non-Conservative	Pollutants that are mitigated by natural biodegradation or other environmental decay or removal processes in the receiving water after mixing and dilution have occurred (e.g., biochemical oxygen demand, pH, volatile organic compounds).	Adapted from 1996 PWM
Pretreatment	The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW.	§ 403.3(s)
Primary Industry Category	Any industry category listed in the NRDC settlement agreement (*Natural Resources Defense Council et al. v. Train,* 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]); also listed in Appendix A of Part 122.	§ 122.2
Primary Treatment	The practice of removing some portion of the suspended solids and organic matter in wastewater through sedimentation. Common usage of this term also includes preliminary treatment to remove wastewater constituents that may cause maintenance or operational problems in the system (i.e., grit removal, screening for rags and debris, oil and grease removal, etc.).	1996 PWM
Priority Pollutants	Those pollutants considered to be of principal importance for control under the CWA based on the NRDC Consent Decree (*NRDC et al. v. Train,* 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]); a list of the pollutants is provided as Appendix A to 40 CFR Part 423.	1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Process Wastewater	Any water [that], during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product.	§ 122.2
Production-Based Standard	A discharge standard expressed in terms of pollutant mass allowed per unit of product manufactured or some other measure of production.	1996 PWM
Proposed Permit	A state NPDES *permit* prepared after the close of the public comment period (and when applicable, any public hearing and administrative appeals) [that] is sent to EPA for review before final issuance by the state. A *proposed permit* is not a *draft permit*.	§ 122.2
Publicly Owned Treatment Works (POTW)	A treatment works as defined by CWA section 212, which is owned by a state or municipality [as defined by CWA section 502(4)]. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW. The term also means the municipality as defined in CWA section 502(4), which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.	§ 403.3(q)
Sanitary Sewer	A pipe or conduit (sewer) intended to carry wastewater or water-borne wastes from homes, businesses, and industries to the POTW.	1996 PWM
Sanitary Sewer Overflows (SSO)	Untreated or partially treated sewage overflows from a sanitary sewer collection system.	1996 PWM
Secondary Industry Category	Any industry category, which is not a *primary industry category*.	§ 122.2
Secondary Treatment	Technology-based requirements for direct discharging POTWs. Standard is based on the expected performance of a combination of physical and biological processes typical for the treatment of pollutants in municipal sewage. Standards are expressed as a minimum level of effluent quality in terms of: BOD_5, total suspended solids (TSS), and pH (except as provided by treatment equivalent to secondary treatment and other special considerations).	Adapted from 1996 PWM
Section 304(a) Criteria	Developed by EPA under authority of CWA section 304(a) based on the latest scientific information on the relationship that the effect of a constituent concentration has on particular aquatic species and/or human health. This information is issued periodically to the states as guidance for use in developing criteria.	§ 131.3(c)
Self-Monitoring	Sampling and analyses performed by a facility to determine compliance with effluent limitations or other regulatory requirements.	1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Sewage Sludge	Any solid, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.	Adapted from § 122.2 and Part 503
Significant Industrial User (SIU)	An indirect discharger that is the focus of control efforts under the National Pretreatment Program. SIUs include [with exceptions provided under § 403.3(v)]: i. All Industrial Users subject to Categorical Pretreatment Standards under § 403.6 and Chapter 1, Subchapter N. ii. Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or requirement [in accordance with § 403.8(f)(6)].	Adapted from § 403.3(v)
Spill Prevention Control and Countermeasure Plan (SPCC)	A plan prepared by a facility to minimize the likelihood of a spill and to expedite control and cleanup activities if a spill occurs. Such plans are required for certain facilities under the Oil Pollution Prevention Regulations at 40 CFR Part 112.	Adapted from 1996 PWM
Standard Industrial Classification (SIC) Code	A code number system used to identify various types of industries. A particular industry may have more than one SIC code if it conducts several types of commercial or manufacturing activities onsite. An online version of the 1987 SIC Manual <www.osha.gov/pls/imis/sic_manual.html> is available courtesy of the Occupational Safety & Health Administration (OSHA).	Adapted from 1996 PWM
Statement of Basis	A document prepared for every draft NPDES permit for which a fact sheet is not required. A statement of basis briefly describes how permit conditions were derived and the reasons the conditions are necessary for the permit.	1996 PWM
STORET	EPA's computerized STOrage and RETrieval water quality data base that includes physical, chemical, and biological data measured in waterbodies throughout the United States.	1996 PWM
Storm Water (or Stormwater)	Stormwater runoff, snow melt runoff, and surface runoff and drainage.	§ 122.26(b)(13)
Technology-Based Effluent Limitation (TBEL)	An effluent limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration or mass loading level. TBELs for POTWs are derived from the secondary treatment regulations in Part 133 or state treatment standards. TBELs for non-POTWs are derived from effluent guidelines, state treatment standards, or by the permit writer on a case-by-case basis using best professional judgment.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Tiered Permit Limits	Permit limits that apply to the discharge only when a certain threshold (e.g., production level), specific circumstance (e.g., batch discharge), or time frame (e.g., after 6 months, during the months of May through October) triggers their use.	Adapted from 1996 PWM
Total Maximum Daily Load (TMDL)	The sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. If best management practices (BMPs) or other nonpoint source pollution controls make more stringent load allocations practicable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs.	40 CFR § 130.2(i)
Total Suspended Solids (TSS)	A measure of the filterable solids present in a sample, as determined by the method specified in Part 136.	1996 PWM
Toxic Pollutant	Any pollutant listed as toxic under CWA section 307(a)(1) or, in the case of *sludge use or disposal practices*, any pollutant identified in regulations implementing CWA section 405(d).	§ 122.2
Toxicity Reduction Evaluation (TRE)	A site-specific study conducted in a step-wise process designed to identify the causative agent(s) of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.	1996 PWM
Toxicity Test	A procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.	1996 PWM
Trading (or Water Quality Trading)	An innovative approach to achieve water quality goals more efficiently. Trading is based on the fact that sources in a watershed can face very different costs to control the same pollutant. Trading programs allow facilities facing higher pollution control costs to meet their regulatory obligations by purchasing environmentally equivalent (or superior) pollution reductions from another source at lower cost, thus achieving the same water quality improvement at lower overall cost.	Water Quality Trading Fact Sheet: <www.epa.gov/owow/watershed/trading/handbook/factsheet.html>
Treatability Manual	Five-set library of EPA guidance manuals that contain information related to the treatability of many pollutants. The manual may be used in developing effluent limitations for facilities and pollutants, which, at the time of permit issuance, are not subject to industry-specific effluent guidelines. The five volumes that comprise this series consist of Vol. I – Treatability Data (EPA-600/8-80-042a); Vol. II – Industrial Descriptions (EPA-600/8-80-042b); Vol. III – Technologies (EPA-600/8-80-042c); Vol. IV – Cost Estimating (EPA-600/8-80-042d); and Vol. V – Summary (EPA-600/8-80-042e).	1996 PWM
Treatment Works Treating Domestic Sewage (TWTDS)	A POTW or any other sewage sludge or waste water treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices. For purposes of this definition, *domestic sewage* includes waste and waste water from humans or household operations that are discharged to or otherwise enter a treatment works.	Adapted from § 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Upset	An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.	§ 122.41(n)
Use Attainability Analysis	A structured scientific assessment of the factors affecting the attainment of the use that [can] include physical, chemical, biological, and economic factors as described in § 131.10(g).	§ 131.3
Variance	Any mechanism or provision under CWA sections 301 or 316 or under 40 CFR Part 125, or in the applicable *effluent limitations guidelines*, which allows modification to or waiver of the generally applicable effluent limitation requirements or time deadlines of the CWA. This includes provisions, [that] allow the establishment of alternative limitations based on fundamentally different factors or on CWA sections 301(c), 301(g), 301(h), 301(i), or 316(a).	§ 122.2
Wasteload Allocation (WLA)	The portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution.	Adapted from § 130.2(h)
Water Quality Criteria	Elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.	§ 131.3(b)
Water Quality Limited Segment	Any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by CWA sections 301(b) and 306.	§ 131.3
Water Quality Standards (WQS)	Provisions of state or federal law that consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based on such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water, and serve the purposes of the CWA.	Adapted from §131.3
Water Quality-Based Effluent Limitation (WQBEL)	An effluent limitation determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, wildlife, translation of narrative criteria) for a specific point source to a specific receiving water.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Waters of the United States	Means a. All waters [that] are currently used, were used in the past, or [could] be susceptible to use in interstate or foreign commerce, including all waters [that] are subject to the ebb and flow of the tide. b. All interstate waters, including interstate *wetlands*. c. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, *wetlands*, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters 1. [That] are or could be used by interstate or foreign travelers for recreational or other purposes. 2. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce or 3. [That] are used or could be used for industrial purposes by industries in interstate commerce. d. All impoundments of waters otherwise defined as waters of the United States under this definition. e. Tributaries of waters identified in paragraphs (a) through (d) of this definition. f. The territorial sea and g. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. [see additional notes in § 122.2]	§ 122.2
Whole Effluent Toxicity (WET)	The aggregate toxic effect of an effluent measured directly by a toxicity test.	§ 122.2

Appendix B. Index to the CWA and NPDES Regulations

This appendix provides two tables to help permit writers navigate Clean Water Act (CWA) legislation and National Pollutant Discharge Elimination System (NPDES) regulations. The first table provides key sections of the CWA and the second table provides an index to NPDES regulations.

B.1 Index to Sections of the CWA

Title 33 of the *United States Code* (U.S.C.) includes the statutes and amendments to the CWA. Exhibit B-1 matches key sections of the CWA to the appropriate reference in the U.S.C. This latest version, dated December 20, 2004, was provided by the New England Interstate Water Pollution Control Commission.

Exhibit B-1 Index to sections of the CWA

33 U.S.C. section	Section title	CWA section
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1252	Comprehensive programs for water pollution control	**102**
1253	Interstate cooperation and uniform laws	**103**
1254	Research, investigations, training and information	**104**
1255	Grants for research and development	**105**
1256	Grants for pollution control programs	**106**
1257	Mine water pollution demonstrations	**107**
1258	Pollution control in the Great Lakes	**108**
1259	Training grants and contracts	**109**
1260	Applications for training grants and contracts; allocations	**110**
1261	Scholarships	**111**
1262	Definitions and authorization	**112**
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	Subchapter II Grants for Construction of Treatment Works	
1281	Congressional declaration of purpose	**201**
1282	Federal share	**202**
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1284	Limitations and conditions	**204**
1285	Allotment of grant funds	**205**
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1291	Sewage collection system	**211**
1292	Definitions	**212**
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1295	Requirements for American materials	**215**
1296	Determination of priority	**216**
1297	Guidelines for cost-effective analysis	**217**
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1301	Sewer overflow control grants	**221**
	Subchapter III Standards and Enforcement	
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1312	Water quality-related effluent limitations	**302**
1313	Water quality standards and implementation plans	**303**
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	Subchapter IV Permits and Licenses	
1341	Certification	**401**
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1343	Ocean discharge criteria	**403**
1344	Permits for dredge and fill materials	**404**
1345	Disposal or use of sewage sludge	**405**
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	Subchapter V General Provisions	
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1362	Definitions	**502**
1363	Water pollution control advisory board	**503**
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Subchapter VI State Water Pollution Control Revolving Funds		
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B.2 Index to NPDES Regulations

The index to NPDES regulations table presented in Exhibit B-2 was created by Sylvia Kawabata of EPA Region 10 on February 1, 1986, and is maintained by Doug Corb of EPA Region 1.

Exhibit B-2 Index to NPDES regulations

Subject	40 CFR section number
Selected CWA sections	
CWA section 301(c) – Modification of Timetable	§ 122.21(m)(2) Part 125, Subpart E (reserved)
CWA section 301(g) – Modifications for Certain Nonconventional Pollutants	§ 122.21(m)(2) Part 125, Subpart F (reserved) *Technical Guidance Manual for the Regulations Promulgated Pursuant to section 301(g) of the Clean Water Act of 1977 and 40 CFR Part 125 (Subpart F); August 22, 1984.* <www.epa.gov/npdes/pubs/owm0008.pdf>
CWA section 301(h) – Secondary Treatment Waiver	§ 122.21(n)(1) Part 125, Subpart G
CWA section 301(n) – Timetable for Achievement of Objectives	See Fundamentally Different Factors
CWA section 316(a) – Thermal Discharges	§ 122.21(m)(6) Part 125, Subpart H § 124.57 § 124.62(a)(2) § 124.66
NPDES permit subjects	
Administrative Procedures Act Permit Continuance	§ 122.6
Administrative Record	§ 124.9 § 124.18

Exhibit B-2 Index to NPDES regulations (continued)

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Ambient Monitoring (for Indicator Parameters)	§ 122.44(d)(1)(vi)(C)(3)
Anti-backsliding	See Backsliding
Antidegradation Policy	§ 131.12
Applicability to State NPDES Programs	See General Conditions for All Permits (State Programs)
Application • Submittal Deadline (Time to Apply) • Permit May Not Be Issued Without Complete Application • Completeness	§ 122.21 • § 122.21(c) • § 122.21(e) • §§ 124.3(c) – 124.3(g)
Aquaculture	§ 122.25 Part 125, Subpart B
Aquatic Animal Production Facilities • Application • Definition Criteria for Determination • General Permit	§ 122.24 • § 122.21(i)(2) • § 122.24 Part 122, Appendix C • § 122.28
Average Monthly (Definition) • Requirements for use in Non-POTWs • Requirements for use in POTWs	§ 122.2 • § 122.45(d)(1) • § 122.45(d)(2)
Average Weekly (Definition) • Requirements for use in POTWs	§ 122.2 • § 122.45(d)(2)
Biochemical Oxygen Demand (BOD_5)	§ 133.101(d)
Backsliding • From Water Quality and Technology Based Limits • From Water Quality	§ 122.44(l) § 122.62(a)(15) § 122.62(a)(17) • CWA section 402(o) • CWA section 303(d)(4)
Best Management Practices • Definition • In Effluent Limitation Guidelines • Case-by-Case Authority	 • § 122.2 § 122.44(k) § 130.2(m) • CWA section 304(e) • CWA section 402(a)(1)
Best Professional Judgment (BPJ) • Case-by-Case Authority • Appropriate Factors	 • §125.3(a)(1) • §§125.3(c) and 125.3(d)
BMP	See Best Management Practices
Boilerplate Permit Conditions	§§ 122.41 - 122.42
BPJ	See Best Professional Judgment
Bypasses	§ 122.41(m)
CAFO	See Concentrated Animal Feeding Operations
Calculating NPDES Permit Conditions	§ 122.45
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	§ 133.101(e)
Case-by-Case Limitations	See also BPJ § 122.44(a) § 125.3
Case-by-Case Permits	See also BPJ § 124.52

Exhibit B-2 Index to NPDES regulations (continued)

Subject	40 CFR section number
Clean Water Act (CWA)	(Public Law 92-500), 33 U.S.C. 1251 *et seq.*, as amended by Public Laws 96-483; 97-117; 95-217, 97-117, 97-440, and 100-04
Coast Guard (Discharges from Transportation Over Water)	§ 122.44(p)
Coastal Zone Management Act	§ 122.49(d)
Combined Sewer Overflow Policy	59 FR 18688, April 19, 1994 <www.epa.gov/npdes/pubs/owm0111.pdf>
Comments Received During Public Notice Period	§ 124.13
Compliance Schedules (in permits) • Allowance by State Water Quality Standards	§ 122.41(l)(5) § 122.47 §§ 122.62(a)(4), (a)(9), (a)(13) • Star-kist Caribe, Inc., NPDES Appeal No. 88-5 <www.epa.gov/npdes/pubs/owm0121.pdf> (EAB, May 25, 1992)
Computation of Time	§ 124.20
Concentrated Animal Feeding Operations	§ 122.23
Concentrated Aquatic Animal Production	See Aquatic Animal Production
Conditions Applicable to Specified Categories	§ 122.42
Confidentiality of Information	§ 122.7 Part 2
Consolidation of Permit Processing	§ 124.4
Continuation of Expired Permits	§ 122.6
Continuous Discharge	§ 122.45(d)
Conventional Pollutants	§ 401.16
Cooling Water Intake Structures [CWA section 316(b)]	Part 125, Subparts I, J and N § 122.21(r) § 401.14
DMR	See Discharge Monitoring Report
Daily Average	See Average Monthly
Daily Maximum	See Maximum Daily
Definitions	§ 122.2 § 124.2 § 401.11
Denial of Permit • Public Notice of Denial	§ 124.6(b) • § 124.10(a)(1)(i)
Design Flow (POTWs)	§ 122.45(b)(1)
Dilution, Not A Substitute For Treatment	§ 122.45(f)(1)(iii) § 125.3(f)
Discharge Monitoring Report (DMR)	§ 122.41(l)(4)
Discharge of a Pollutant (Definition)	§ 122.2
Disposal into Wells, into POTWs, or by Land Application	§ 122.50 § 122.45(i)
Draft Permit	§ 124.6
Dredged Materials (Discharge to Waters of the United States)	CWA section 404
Duration of Permits • Computation of time	§ 122.46 • § 124.20
Duty to Comply	§ 122.41(a)
Duty to Mitigate	§ 122.41(d)
Duty to Provide Information	§ 122.41(h)
Duty to Reapply	§ 122.41(b)
Effect of a Permit	§ 122.5

Exhibit B-2 Index to NPDES regulations (continued)

Subject	40 CFR section number
Effective Date	§ 124.15
Effluent Limitations Guidelines (Effluent Guidelines or ELG)	Parts 405-471
Endangered Species Act	§ 122.49(c)
Enforcement Authority	§ 123.27
Environmental Impact Statement (EIS) • EIS Public Notice of a New Source • Final EIS • New Source • NEPA	 • § 124.10(b)(1) • § 124.61 • § 122.29(c) • Part 6
Equivalent To Secondary Treatment (for POTWs)	§ 133.105
Establishing Limitations, Standards	§ 122.44
Establishing Permit Conditions	§ 122.43
Evidentiary Hearing Procedures (Eliminated)	§§ 124.21 (b) - (c)
Exclusions	§ 122.3
Existing Source (Definition)	§ 122.29(a)(3)
Expiration Dates	See Duration of Permits
Extension of Public Notice Comment Period	§ 124.12(c)
FDF	See Fundamentally Different Factors
Fact Sheets	§ 124.8 § 124.56
Feedlots	See Concentrated Animal Feeding Operations
Filter Backwash	§ 125.3(g)
Fish and Wildlife Coordination Act	§ 122.49(e)
Fish Farms	See Aquatic Animal Production Facilities
Flow Augmentation	§ 125.3(f)
Flow Limits (POTW - Design Flow)	§ 122.45(b)
Flow Monitoring Requirement	§ 122.44(i)(1)(ii)
Fundamentally Different Factors (FDF)	§ 122.21(m)(1) § 122.44(d)(8) Part 125, Subpart D
Frequency of Sampling (Not less than once per year)	§ 122.44(i)(2)
General Conditions Applicable to All Permits	§ 122.41
General Conditions for All Permits (State Programs)	§ 123.25
General Permits • Public Notice • Individual Permit Required	§ 122.28 • § 124.10(c)(2)(i) • § 122.28(b)(3)
Great Lakes Water Quality Guidance	Part 132
Indian Tribe (Definition)	§ 124.2
Innovative Technology	See CWA section 301(k) – Innovative Technology
Inspection and Entry	§ 122.41(i)
Internal Waste Streams	§ 122.45(h)
Interim Dates for Schedules of Compliance	§ 122.47(a)(3)
Introduction of New Pollutants (POTW)	§ 122.42(b)
Issuance and Effective Date	§ 124.15 § 124.60
Mass Limitations	§ 122.45(f) § 122.44(i)(1)(i)
Maximum Daily (Definition) • Requirements for Non-POTWs	§ 122.2 • § 122.45(d)(1)
Metals (To Be Expressed as Total Recoverable)	§ 122.45(c)

Exhibit B-2 Index to NPDES regulations (continued)

Subject	40 CFR section number
Method Detection Limit	Part 136, Appendix B
Minor Modifications	§ 122.63
Mixing Zones	§ 131.13
Modifications	§ 122.62 § 124.5
Monitoring Results, Requirements for Recording and Reporting	§ 122.48
Monitoring and Records • Monitoring Reports • Requirements • Recordkeeping	§ 122.41(j) • § 122.41(l)(4) • § 122.44(h) • § 122.21(p)
Municipal Separate Storm Sewer Systems (MS4) • When Permit Required • Definitions	 • §§ 122.26(a)(3), (4), and (5) • § 122.26(b)
• Large and Medium MS4s Application Requirements • Small MS4 Requirements	• § 122.26(d) • §§ 122.30 and 122.32 - 122.37
• Tribes	• § 122.31
NPDES (Definition)	§ 122.2
National Environmental Policy Act (NEPA)	§ 122.49(g)
National Historic Preservation Act	§ 122.49(b)
Navigable Waters (Definition)	§ 110.1
Navigation	§ 122.44(q)
Need to Halt or Reduce Activity, Not a Defense	§ 122.41(c)
Net/Gross - Intake Credits	§ 122.45(g)
New Discharger (Definition)	§ 122.2
New Source • Definition • Application Requirements • Program Requirements • Determination • Mitigation Measures • Prohibited discharges • Public Notice	 • § 122.2 • § 122.21(k) • § 122.29 • § 122.29(b) • § 122.44(d)(9) • § 122.4(i) • § 124.10(a)(1)(vi)
Non-Attainment Waters	§ 130.10(d)
Non-Continuous Discharges	§ 122.45(e)
Noncompliance • Anticipated • Other	 • § 122.41(l)(2) • § 122.41(l)(7)
Notification Levels • General • For Existing Manufacturing, Commercial, Mining, and Silvicultural Dischargers	 • § 122.62(a)(12) • § 122.42(a) • § 122.44(f)
Ocean Discharge Criteria	Part 125, Subpart M
Offshore Oil and Gas Facilities • Requirements Applicable to Cooling Water Intake Structures for New Offshore Oil and Gas Extraction Facilities under CWA section 316(b) • General Permit Requirements & Application Effluent Guidelines and Standards	 • Part 125, Subpart N • § 122.28(c) Part 435, Subpart A
Stormwater Exemption	§ 122.26(a)(2)
Oil Pollution Prevention	Part 112

Exhibit B-2 Index to NPDES regulations (continued)

Subject	40 CFR section number
On-Site Construction (New Source)	§ 122.29(b)(4)
Operation and Maintenance	§ 122.41(e)
pH Limits with Continuous Monitoring	§ 401.17
Planned Changes	§ 122.41(l)(1)
Pollutant (Definition)	§ 122.2
POTWs, Applications for New and Existing	§ 122.21(j)
Pretreatment	§ 122.44(j) Part 403
Primary Industry Categories	Part 122, Appendix A
Prior Notice of Citizen Suits (Under CWA)	Part 135
Priority Pollutants	Part 423, Appendix A
Privately Owned Treatment Works	§ 122.44(m)
Production-based Limitations	§ 122.45(b)
Prohibitions	§ 122.4
Proper Operation and Maintenance	§ 122.41(e)
Property Rights	§ 122.41(g)
Public Hearing • Public Notice for Public Hearings	§ 124.12 • § 124.10(b)(2) § 124.10(d)(2)
Public Notice • Specific Procedures Applicable to NPDES Permits	§ 124.10 • § 124.57
Reapplication	§ 122.21(d)
Recordkeeping and Reporting	§ 122.21(p) § 122.41(j)(2) § 122.48
Reopener Clause • Treatment Works Treating Domestic Sewage • Other	 • § 122.44(c) • § 122.62(a)(7)
Reopening of Public Comment Period	§ 124.14
Response to Comments	§ 124.17
Reasonable Potential (RP) - Need For A Limit • Chemical Specific • Whole Effluent Toxicity (WET)	§ 122.44(d)(1) • § 122.44(d)(1)(vi) • § 122.44(d)(1)(v)
Retention of Records	§ 122.41(j)(2)
Revocation and Reissuance	§ 122.62
Sample Type (Composite/Grab)	§ 122.21(g)(7)(i)
Sample Holding Times, Containers, and Preservation	§ 136.3
Sample, Representative	§ 122.41(j)
Schedule of Compliance (Definition)	See also Compliance Schedule § 124.2
Secondary Treatment Regulation (POTW) • Definitions • Secondary Treatment • Special Considerations • Treatment Equivalent to Secondary Treatment	Part 133 • § 133.101 • § 133.102 • § 133.103 • § 133.105
Signatory Requirements	§ 122.22
Silviculture	§ 122.27

Exhibit B-2 Index to NPDES regulations (continued)

Subject	40 CFR section number
Sludge (Definition) • Sludge Standards • Land Application • Surface Disposal • Pathogens and Vector Attraction Reduction • Incineration	§ 122.44(o) • Part 503 • Part 503, Subpart B • Part 503, Subpart C • Part 503, Subpart D • Part 503, Subpart E
Sludge, Municipal Co-Disposal Landfills	Part 258
Sludge-Only Facilities (Handlers)	§ 122.1(b)(3)
Small Business Exemption	§ 122.21(g)(8)
Solid Waste Facilities, Classification of	Part 257
Spill Prevention, Control, and Countermeasures (SPCC)	§ 112.3
Standard Conditions	§§ 122.41 and 122.42
State Certification • Applications for CWA section 301(h) Variances • Effect of State Certification	§ 124.53 • § 124.54 • § 124.55
State Program Requirements	Part 123
Statutory Deadlines • For POTWs • For Non-POTWs	 • § 125.3(a)(1) • § 125.3(a)(2)
Statutory Variances and Extensions	§ 125.3(b)
Stays of Contested Permit Conditions	§ 124.16
Stormwater • Discharge Associated with Industrial Activity	§ 122.26 • § 122.26(b)(14)
Test Methods, EPA Approved	Part 136
Ten-Year Protection Period	See also New Sources and Dischargers § 122.29
Termination of a Permit	§ 122.64
Thermal Discharge Variance	See CWA section 316(a) – Thermal Discharges
Total Maximum Daily Load (TMDL) • Definition • Which Waterbodies Need TMDLs	 • § 130.2 • § 130.7
Toxics – Application and Testing	§ 122.21(g)(7) § 122.21(g)(9) § 122.21(g)(11)
Toxic Pollutants (Definition) • Technology-based Controls	§ 122.2 • § 122.44(e)
Toxic Pollutant List	§ 401.15
Toxicity Based Permit Limits	§ 125.3(c)(4)
Transfer of Permit	§ 122.61
Treatment Works Treating Domestic Sewage Sludge (TWTDS) (Definition)	§ 122.2
Twenty-four Hour Reporting	§ 122.41(l)(6)
Upset	§ 122.41(n)
Variances for • Non-POTWs • POTWs • Appeals of variances • Decisions on variances • Expedited variance procedures and time extensions • Procedures for variances when EPA is the permitting authority	 • § 122.21(m) • § 122.21(n) • § 124.64 • § 124.62 • § 122.21(o) • § 124.63

Exhibit B-2 Index to NPDES regulations (continued)

Subject	40 CFR section number
Vessel (Definition)	§ 112.2
Waste Stabilization Ponds (POTW)	§ 133.103(c)
Water Quality Report – CWA section 305(b)	§ 130.8
Water Quality Standards (WQS) • Scope • Purpose • Definitions • State Authority • EPA Authority • Submission, Minimum Requirements • Dispute Resolution • Establishment of Standards • Criteria • Antidegradation Policy • General Policies on Establishing WQS • State Review and Revision of WQS • EPA Review and Approval of WQS • EPA Promulgation of WQS • Federally Promulgated Standards (State-By-State List)	Part 131 • § 131.1 • § 131.2 • § 131.3 • § 131.4 • § 131.5 • § 131.6 • § 131.7 • § 131.10 • § 131.11 • § 131.12 • § 131.13 • § 131.20 • § 131.21 • § 131.22 • Part 131, Subpart D
Waters of the United States (Definition)	§ 122.2
Wetlands	See Waters of the U.S. § 122.2
Whole Effluent Toxicity (WET) Limits	§ 122.44(d)(1)(iv) § 125.3(c)(4)
WET Testing With Permit Application (POTWs)	§ 122.21(j)
Wild and Scenic Rivers Act	§ 122.49(a)
Withdrawal Of State Program	§§ 123.63 - 123.64

Appendix C. Priority Pollutants

Exhibit C-1 presents the list of 126 priority (toxic) pollutants from 40 CFR Part 423 Appendix A, which are further discussed in sections 1.2 and 6.1.1.2 of this manual. Note that the list goes up to 129 because numbers 017, 049, and 050 were deleted.

Exhibit C-1 Priority pollutants from 40 CFR Part 423, Appendix A

#	Pollutant name	#	Pollutant name
001	Acenaphthene	067	Butyl benzyl phthalate
002	Acrolein	068	Di-N-Butyl Phthalate
003	Acrylonitrile	069	Di-n-octyl phthalate
004	Benzene	070	Diethyl Phthalate
005	Benzidine	071	Dimethyl phthalate
006	Carbon tetrachloride (tetrachloromethane)	072	1,2-benzanthracene (benzo(a) anthracene
007	Chlorobenzene	073	Benzo(a)pyrene (3,4-benzo-pyrene)
008	1,2,4-trichlorobenzene	074	3,4-Benzofluoranthene (benzo(b) fluoranthene)
009	Hexachlorobenzene	075	11,12-benzofluoranthene (benzo(b) fluoranthene)
010	1,2-dichloroethane	076	Chrysene
011	1,1,1-trichloreothane	077	Acenaphthylene
012	Hexachloroethane	078	Anthracene
013	1,1-dichloroethane	079	1,12-benzoperylene (benzo(ghi) perylene)
014	1,1,2-trichloroethane	080	Fluorene
015	1,1,2,2-tetrachloroethane	081	Phenanthrene
016	Chloroethane	082	1,2,5,6-dibenzanthracene (dibenzo(,h) anthracene)
018	Bis(2-chloroethyl) ether	083	Indeno (,1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
019	2-chloroethyl vinyl ether (mixed)	084	Pyrene
020	2-chloronaphthalene	085	Tetrachloroethylene
021	2,4, 6-trichlorophenol	086	Toluene
022	Parachlorometa cresol	087	Trichloroethylene
023	Chloroform (trichloromethane)	088	Vinyl chloride (chloroethylene)
024	2-chlorophenol	089	Aldrin
025	1,2-dichlorobenzene	090	Dieldrin
026	1,3-dichlorobenzene	091	Chlordane (technical mixture and metabolites)
027	1,4-dichlorobenzene	092	4,4-DDT
028	3,3-dichlorobenzidine	093	4,4-DDE (p,p-DDX)
029	1,1-dichloroethylene	094	4,4-DDD (p,p-TDE)
030	1,2-trans-dichloroethylene	095	Alpha-endosulfan
031	2,4-dichlorophenol	096	Beta-endosulfan
032	1,2-dichloropropane	097	Endosulfan sulfate
033	1,2-dichloropropylene (1,3-dichloropropene)	098	Endrin
034	2,4-dimethylphenol	099	Endrin aldehyde
035	2,4-dinitrotoluene	100	Heptachlor
036	2,6-dinitrotoluene	101	Heptachlor epoxide (BHC-hexachlorocyclohexane)
037	1,2-diphenylhydrazine	102	Alpha-BHC
038	Ethylbenzene	103	Beta-BHC
039	Fluoranthene	104	Gamma-BHC (lindane)
040	4-chlorophenyl phenyl ether	105	Delta-BHC (PCB-polychlorinated biphenyls)

Exhibit C-1 Priority pollutants from 40 CFR Part 423, Appendix A (continued)

#	Pollutant name	#	Pollutant name
041	4-bromophenyl phenyl ether	106	PCB-1242 (Arochlor 1242)
042	Bis(2-chloroisopropyl) ether	107	PCB-1254 (Arochlor 1254)
043	Bis(2-chloroethoxy) methane	108	PCB-1221 (Arochlor 1221)
044	Methylene chloride (dichloromethane)	109	PCB-1232 (Arochlor 1232)
045	Methyl chloride (dichloromethane)	110	PCB-1248 (Arochlor 1248)
046	Methyl bromide (bromomethane)	111	PCB-1260 (Arochlor 1260)
047	Bromoform (tribromomethane)	112	PCB-1016 (Arochlor 1016)
048	Dichlorobromomethane	113	Toxaphene
051	Chlorodibromomethane	114	Antimony
052	Hexachlorobutadiene	115	Arsenic
053	Hexachloromyclopentadiene	116	Asbestos
054	Isophorone	117	Beryllium
055	Naphthalene	118	Cadmium
056	Nitrobenzene	119	Chromium
057	2-nitrophenol	120	Copper
058	4-nitrophenol	121	Cyanide, Total
059	2,4-dinitrophenol	122	Lead
060	4,6-dinitro-o-cresol	123	Mercury
061	N-nitrosodimethylamine	124	Nickel
062	N-nitrosodiphenylamine	125	Selenium
063	N-nitrosodi-n-propylamin	126	Silver
064	Pentachlorophenol	127	Thallium
065	Phenol	128	Zinc
066	Bis(2-ethylhexyl) phthalate	129	2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

Appendix D. New Source Dates by Effluent Guideline Category

This appendix provides the applicable new source dates used in making new source determinations by effluent guideline category as provided in Appendix B of the U.S. Environmental Protection Agency (EPA) memorandum *New Source Dates for Direct and Indirect Dischargers*[1] <www.epa.gov/npdes/pubs/newsource_dates.pdf> sent by the directors of EPA's Water Permits Division and the Engineering and Analysis Division to the Regional Water Division Directors on September 28, 2006. Section 5.2.2.4 of this manual discusses the determination of whether existing or new source standards apply.

EPA has promulgated regulations under the Clean Water Act (CWA) that establish effluent limitations guidelines for existing sources, standards of performance for new sources and pretreatment standards for new and existing sources. EPA has codified these regulations at Title 40 of the *Code of Federal Regulations* (CFR) Subchapter N. As discussed in section 5.2.1 of this manual, EPA has published effluent guidelines for 56 major industrial categories (over 450 subcategories) since the passage of the 1972 CWA. Those regulations limit the discharge of pollutants to surface waters by point source dischargers (*direct dischargers*). The regulations also limit the introduction of pollutants into publicly owned treatment works (POTWs) by industrial users (*indirect dischargers*). The CWA and EPA regulations define when a source is a *new source*. A discharger is defined as a new source in CWA sections 306(a)(2) and 307(c) and §§ 122.2 (for direct dischargers) and 403.3(m) (for indirect dischargers). In general, a facility is a new source if it begins construction after either the date of promulgation of new source performance standards applicable to the direct dischargers or the date of publication of a proposed new source performance standard applicable to an indirect discharger.

Exhibit D-1 lists new source dates for direct or indirect dischargers based on regulatory definitions. In some cases, effluent guidelines in 40 CFR Chapter I, Subchapter N, specify New Source Dates, and these dates are reported in the table below. If dates are not specified in the rule language, EPA based the date on the regulatory definitions of new source, which are cited above. EPA's General Pretreatment Regulations provide that an indirect source is a new source if construction of the source began after the publication of proposed pretreatment standards for new sources if the proposed standard is later finalized [§ 403.3(m)]. For direct dischargers, § 122.2 states that the New Source date is the proposal date if the standard is finalized within 120 days after its proposal; otherwise, the New Source date is the *promulgation date*. EPA's regulations establish the time and date of EPA's actions for purposes of determining when the action is subject to judicial review. The regulations, in the case of the CWA, define the date of an EPA promulgation action as two weeks after the rule appears in the *Federal Register* (see § 23.2). Before February 1985, the date on which the final rule was published was considered the promulgation date.

This document is not a regulation itself, nor does it substitute for any requirements under the CWA or EPA's regulations. Thus, it does not impose legally binding requirements on EPA, states or the regulated community. While EPA has made every effort to ensure the accuracy of this table, dischargers' obligations are determined, in the case of direct dischargers, by the terms of their NPDES permit and the CWA and EPA's regulations, and, in the case of indirect dischargers, by permits or equivalent control

mechanisms issued to POTW industrial users and the CWA and EPA regulations. Nothing in this document changes any statutory or regulatory requirement. If the discussion in this memorandum conflicts with any permit or regulation, this document would not be controlling.

Exhibit D-1 New source dates by effluent category

40 CFR Part	Category	New source date for direct dischargers		New source date for indirect dischargers	
467	Aluminum Forming	Subparts A-F:	10/24/83	Subparts A-F:	11/22/82
427	Asbestos Manufacturing	Subparts A-K:	10/30/73[2]	Not Applicable	
461	Battery Manufacturing	Subparts A-G:	03/09/84	Subparts A-G	11/10/82
407	Canned and Preserved Fruits and Vegetables Processing	Subparts A-H:	03/21/74	Not Applicable	
408	Canned and Preserved Seafood Processing	Subparts A-J, N: Subparts O-AG:	06/26/74 12/01/75	Not Applicable	
458	Carbon Black Manufacturing	Subparts A-D:	01/09/78	Subparts A-D:	05/18/76
411	Cement Manufacturing	Subparts A-C:	02/20/74	Not Applicable	
437	Centralized Waste Treatment (CWT)	Subparts A-D:	01/05/01	Subparts A-D:	01/13/99
434	Coal Mining	Subparts B-E, H: Subpart G:	05/04/84[3] 02/22/02[4]	Not Applicable	
465	Coil Coating	Subparts A-C: Subpart D:	12/01/82 11/17/83	Subparts A-C: Subpart D:	01/12/81 02/10/83
412	Concentrated Animal Feeding Operations (CAFO)	Subparts A-B: Subparts C-D:	02/14/74 04/14/03[5]	Subpart B:	09/07/73
451	Concentrated Aquatic Animal Production	Subparts A-B:	09/07/04	Not Applicable	
468	Copper Forming	Subpart A:	08/15/83	Subpart A:	11/12/82
405	Dairy Products Processing	Subparts A-L:	05/28/74	Not Applicable	
469	Electrical and Electronic Components	Subparts A-B: Subparts C-D:	04/08/83 12/14/83	Subparts A-B: Subparts C-D:	08/24/82 03/09/83
413	Electroplating	Not Applicable[6]		See Metal Finishing[7]	
457	Explosives Manufacturing	Not Applicable		Not Applicable	
424	Ferroalloy Manufacturing	Subparts A-C:	02/22/74	Not Applicable	
418	Fertilizer Manufacturing	Subparts A-D: Subpart E: Subparts F-G:	04/08/74 01/16/76 10/07/74[8]	Subparts A-D[9]: Subpart E: Subparts F-G:	12/07/73 01/16/76 10/07/74
426	Glass Manufacturing	Subpart A: Subparts B-D: Subparts E-G: Subparts H, J-M:	01/22/74 02/14/74 02/14/74 01/16/75	Subparts H, K-M:	08/21/74
406	Grain Mills	Subparts A-J:	12/04/73[10]	Subpart A:	12/04/73
454	Gum and Wood Chemicals	Not Applicable		Not Applicable	
460	Hospitals	Not Applicable		Not Applicable	
447	Ink Formulating	Subpart A:	07/28/75	Subpart A:	02/26/75

Exhibit D-1 New source dates by effluent category (continued)

40 CFR Part	Category	New source date for direct dischargers		New source date for indirect dischargers	
415	Inorganic Chemicals	Subparts B-F, H, K-N, P, Q, T, V, W, AJ [$CuSO_4$ manufacturing], AH, AP, AU [$NiSO_4$ manufacturing], BB: Subparts AJ [except $CuSO_4$ manufacturing], AU [except $NiSO_4$ manufacturing], BL - BO:	06/29/82 08/22/84	Subparts B-F, H, K-N, P, Q, V, AH, AJ [$CuSO_4$ manufacturing], AP, AU [$NiSO_4$ manufacturing], BB: Subparts T, AA, AC, AE, AI, AJ [except $CuSO_4$ manufacturing], AL, AN, AQ, AR, AU [except $NiSO_4$ manufacturing], AX, BC, BH, BK-BO:	07/24/80 10/25/83
420	Iron and Steel Manufacturing	Subparts A-B: Subpart C: Subpart D, Semi-Wet: Subpart D, Other: Subparts E-L: Subpart M:	11/18/02[11] 05/27/82 10/31/02 05/27/82 05/27/82 10/31/02	Subparts A-B: Subpart C: Subpart D, Semi-Wet: Subpart D, Other: Subparts E-F, H-J,L: Subpart M:	11/18/02[12] 01/07/81 12/27/00 01/07/81 01/07/81 12/27/00
445	Landfills	Subparts A-B:	02/02/00	Not Applicable	
425	Leather Tanning and Finishing	Subparts A, B, D-I: Subpart C:	11/23/82 04/04/88	Subpart A, B, D-I: Subpart C:	07/02/79 01/21/87
432	Meat and Poultry Products	Subparts A-D, Small Facilities: Subparts A-D, Other: Subparts E-I, Small Facilities: Subparts E-I, Other: Subpart J-L:	02/28/74[13] 09/22/04 01/03/75[14] 09/22/04 09/22/04	Not Applicable	
433	Metal Finishing	Subpart A:	07/15/83	Subpart A:	08/31/82
464	Metal Molding and Casting	Subparts A-D:	11/13/85	Subparts A-D:	11/15/82
438	Metal Products and Machinery	Subpart A:	06/12/03[15]	Not Applicable	
436	Mineral Mining and Processing	Not Applicable		Not Applicable	
471	Nonferrous Metals Forming and Metal Powders	Subparts A-J:	09/06/85	Subparts A-J:	03/05/84
421	Nonferrous Metal Manufacturing	Subparts B-I (except molybdenum acid plants), K-M: Subparts N-AE, molybdenum acid plants in subpart I: Subpart J:	03/08/84 10/04/85 02/04/88	Subparts B-I (except molybdenum acid plants), K-M: Subparts N-AE, molybdenum acid plants in subpart I: Subpart J:	02/17/83 06/27/84 01/22/87
435	Oil and Gas Extraction[16]	Subparts C (Onshore), D (Coastal), and E (Agriculture & Wildlife): Subparts A and D (Synthetic-Based Drilling Fluids):	03/04/93 02/05/01	Subpart D:	02/17/95
440	Ore Mining and Dressing	Subparts A-F, J, M:	12/03/82	Not Applicable	

Exhibit D-1 New source dates by effluent category (continued)

40 CFR Part	Category	New source date for direct dischargers		New source date for indirect dischargers	
414	Organic Chemicals, Plastics, and Synthetic Fibers	Subparts B-H:	11/19/87	Subparts B-H:	03/21/83
446	Paint Formulating	Subpart A:	07/28/75	Subpart A:	02/26/75
443	Paving and Roofing Materials (Tars and Asphalt)	Subparts A-D:	07/28/75	Subparts A-D:	01/10/75
455	Pesticide Chemicals	Subparts A-B: Subparts C, E:	10/12/93 11/20/96	Subparts A-B: Subparts C, E:	04/10/92 04/14/94
419	Petroleum Refining	Subparts A-E:	10/18/82	Subparts A-E:	12/21/79
439	Pharmaceutical Manufacturing	Subparts A-D:	11/20/98[17]	Subparts A-D:	05/02/95
422	Phosphate Manufacturing	Subparts D-F:	06/23/76	Not Applicable	
459	Photographic	Not Applicable		Not Applicable	
463	Plastics Molding and Forming	Subparts A-C:	12/17/84	Not Applicable	
466	Porcelain Enameling	Subparts A-D:	11/24/82	Subparts A-D:	01/27/81
430	Pulp, Paper, and Paperboard	Subparts B, E: Subparts A, C, D, F, G, I-L:	06/15/98[18] 11/18/82	Subparts B, E: Subparts A, C, D, F, G, I-L:	12/17/93 01/06/81
428	Rubber Manufacturing	Subparts A-D: Subparts E-J:	02/21/74 01/10/75	Subparts E-K:	08/23/74
417	Soap and Detergents Manufacturing	Subparts A-S:	4/12/74	Subpart Q: Subparts O, P, R:	12/26/73 02/20/75
423	Steam Electric Power Generation		11/19/82[19]		10/14/80
409	Sugar Processing	Subpart A: Subparts B, C:	1/31/74 12/07/73[20]	Not Applicable	

[1] Boornazian, Linda and Mary Smith. 2006. *New Source Dates for Direct and Indirect Dischargers*. U.S. Environmental Protection Agency, Office of Water Memorandum. September 28, 2006. <www.epa.gov/npdes/pubs/newsource_dates.pdf>.

[2] The rule was finalized within 120 days of its October 30, 1973, proposal (38 FR 22606).

[3] The New Source date is specified in 40 CFR 434.11(j)(1).

[4] The New Source date is specified in 40 CFR 434.11(j)(1).

[5] New Source date derived from the 10-year protection period [see 40 CFR 412.35(d) and 412.43(d)].

[6] Direct dischargers formerly regulated under Part 413 are now regulated under Part 433 (metal finishing).

[7] Pretreatment categorical standards in Part 413 currently apply only to job shop electroplaters and independent printed circuit board manufacturers that were in existence before the New Source date for Part 433 (metal finishing). Job shop electroplaters and independent printed circuit board manufacturers that are "New Sources" must comply with PSNS in Part 433. Except for these "existing" job shop electroplaters and independent printed circuit board manufacturers, all other operations formerly subject to Part 413 are now subject to Part 433.

[8] The rule was finalized within 120 days of its October 7, 1974, proposal.

[9] Section 41 8.46 (the PSNS under Subpart D) was suspended until further notice, at 40 FR 26275, June 23, 1975, effective July 20, 1975.

[10] The rule was finalized within 120 days of its December 4, 1973, proposal (38 FR 33438).

Endnotes for this chapter continued on the next page.

[11] Date specified in 40 CFR 420.14(a)(2), 420.16(a)(2), 420.24(b), and 420.26(a)(2).

[12] See previous footnote.

[13] The 2004 Amendment did not revise NSPSs for small meat products facilities in Subparts A-I, so the 2004 New Source date does not affect these facilities.

[14] See previous footnote.

[15] Date specified in 40 CFR 438.15.

[16] See promulgated standards at 40 CFR 58 FR 12505 and 66 FR 6850 for complete information on the applicability of New Source standards.

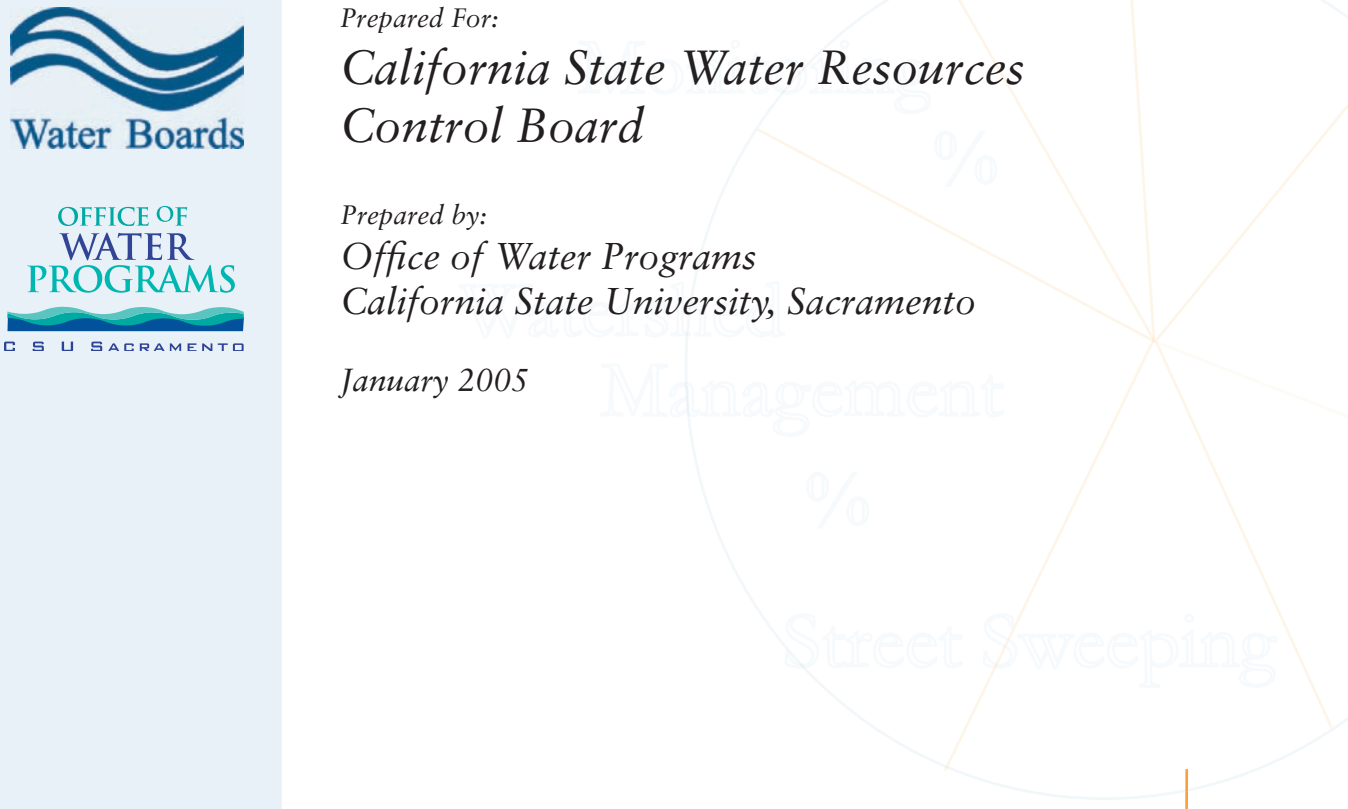
[17] New Source date derived from the 10-year protection period [see 40 CFR 439.15(c), 439.35(c), and 439.45(b)].

[18] Date specified in 40 CFR 430.25(b) and 430.55(b). Refer to these sections for additional information regarding the applicability of NSPSs.

[19] NSPS promulgated were not removed via the 1982 regulation; therefore wastewaters generated by Part 423-applicable sources that were New Sources under the 1974 regulations are subject to the 1974 NSPS. The New Source date for the 1974 regulations was 10/8/1974.

[20] The rule was finalized within 120 days of its December 7, 1973, proposal (38 FR 33846).

NPDES Stormwater Cost Survey



OFFICE OF WATER PROGRAMS
C S U SACRAMENTO

Prepared For:
California State Water Resources Control Board

Prepared by:
Office of Water Programs
California State University, Sacramento

January 2005

USC UNIVERSITY OF SOUTHERN CALIFORNIA

Includes Appendix H:
Alternative Approaches to Stormwater Control
Prepared by:
Center for Sustainable Cities
University of Southern California

Contract: 02-189-250-0

NPDES Stormwater Cost Survey
Final Report

Brian K. Currier, P.E.
Research Engineer - Environmental
California State University, Sacramento
Office of Water Programs

Joseph M. Jones
Accountant
California State University, Sacramento
Office of Water Programs

Glenn L. Moeller, P.E.
Research Engineer - Environmental
California State University, Sacramento
Office of Water Programs

Contract Manager:
Bruce Fujimoto, P.E.
California State Water Resources Control Board

January 2005

OFFICE OF WATER PROGRAMS
C S U SACRAMENTO

EXECUTIVE SUMMARY

This report is funded by the California State Water Resources Control Board under contract 02-189-250-0, "Survey of Costs to Develop, Implement, Maintain and Monitor Municipal Separate Storm Sewer System (MS4) Storm Water Management Programs and Description of Alternatives for Control of Stormwater Quality in Los Angeles County."

BACKGROUND

The current costs to implement best management practices (BMPs) have been the basis for lawsuits and petitions challenging the California stormwater regulatory program. Additionally, some permittees contend that current MS4 permits necessitate the use of advanced water treatment to meet water quality standards, which would drastically escalate costs above current levels. This contention is presented in the report titled "An Economic Impact Evaluation of Proposed Storm Water Treatment for Los Angeles County" (Gordon, 2002). This project addresses these issues through two tasks.

Task A – Documenting Stormwater Program Costs

Five California municipalities and one metropolitan area with stormwater programs that are demonstrating meaningful progress toward maximum extent practicable (MEP) compliance as identified by Regional Water Quality Control Board (RWQCB) staff were surveyed for the most recent stormwater compliance costs. Demonstrating meaningful progress is defined in this report as implementing activities specifically presented in the Storm Water Management Plans (SWMPs). Because permits use an iterative approach that increases requirements until water quality objectives are met, current levels of implementation may not be the ultimate MEP standard. This report does not address the benefits of permit compliance activities. Some scenarios addressing ultimate compliance cost are addressed in Task B. Task A was accomplished by the Office of Water Programs (OWP) at California State University, Sacramento (CSUS).

Task B – Alternative Approaches to Stormwater Quality Control

Task B is an assessment of regulatory policy to determine the intent of stormwater regulation regarding advanced treatment. Alternatives for stormwater quality control that are believed to comply with the intent of the regulations are described. Costs were estimated for the Los Angeles Regional Water Quality Control Board (LARWQCB) area. Task B was accomplished by the University of Southern California (USC) and the University of California at Los Angeles (UCLA).

RESULTS

Cost Survey (Task A)

Annual cost per household for the six stormwater programs surveyed ranged from $18 to $46, as seen in Table 1.

EXECUTIVE SUMMARY

Table 1. Stormwater Costs per Household for the California Cost Survey (Task A)

Municipalities	Municipality Description	Cost/Household ($)
City of Encinitas	Coastal tourism, small city	46
City of Fremont	Bay Area, moderately integrated countywide program	45
City of Santa Clarita	Tourism and industrial	39
City of Corona	Industrial	32
City of Sacramento	Pumped stormwater, large city	29
Fresno-Clovis Metropolitan Area	65-90% infiltration, fully integrated multi-city program	18

The Fresno-Clovis Metropolitan Area (FCMA) had substantially lower cost per household. The following factors are thought to contribute to the FCMA costs limit costs being lower than the other survey results:

- flood control and stormwater quality basins are combined,
- land was set aside for water projects,
- climate helps infiltration due to infrequent storms and low annual rainfall,
- lower land cost compared to other cities,
- FMFCD owned land needed for basins prior to storm water permits requirements,
- topography lends to drainage of urban areas to post-construction BMPs, and
- highly permeable soils allow extensive use of infiltration.

These factors are unique or more prevalent for FCMA than for the other cities surveyed. Excluding the FCMA as an ideal situation, the range of cost is $29 to $46 per household.

The results of the survey are compared to values from the USEPA report "Economic Analysis of the Final Phase II Stormwater Rule." This report contains a summary of costs from two separate efforts to estimate Phase II cost per household. The first is the results of a survey stormwater costs for 56 Phase II municipalities performed by the National Association of Flood and Stormwater Management Agencies (NAFSMA). The NAFSMA survey represents the six minimum measures of the Phase II regulations because two measures seemed to have been combined: 1) Public Education and Outreach and 2) Public Involvement and Participation.

The second effort presented in the USEPA report is the results of a review by USEPA of annual stormwater reports from 26 Phase I municipalities. These municipalities were chosen were smaller Phase I cities, were nearly in the first permit term, and had reported cost in their annual reports. The California survey results for the cost categories corresponding to the six minimum measures were extracted to compare to the NAFSMA survey and the EPA review. The results of this comparison are in Table 2.

Table 2. Stormwater Costs per Household for Six[1] Minimum Measures from the California Survey, the NAFSMA[2] Phase II Survey, and the USEPA review of Phase I Annual Reports (USEPA, 1999)

Study	Median (50%) ($)	Mean ($)	Max ($)
Adjusted California Survey[3]	24	26	35
NAFSMA Phase II Survey[4]	4.63	10	61
EPA Phase I Survey[5]	3.16	10	67

1. Public Education and Outreach and Public Involvement and Participation were assumed combined for the NAFSMA survey.
2. NAFSMA: National Association of Flood and Stormwater Management Agencies
3. Based only on costs from cost categories that correspond to the six minimum measures
4. NAFSMA survey based on 56 Phase II respondents to a survey on stormwater costs for five minimum measures. Values adjusted to 2003 dollars.
5. EPA results based on a review of 26 annual reports for smaller Phase I cities that were nearly in their first NPDES term so that costs would be more representative of Phase II programs. Values adjusted to 2003 dollars.

In some cases, programs in the California survey appeared to go beyond the minimum requirements of the permit. The cost of this additional effort was not included when it could be identified or estimated, such as street sweeping in Sacramento that was above the permit required frequency. Including the total cost of the street sweeping program the cost per household for Sacramento would increase $1.69. In some cases the additional effort could not be estimated. This was particularly true when stormwater activities were combined with activities that occurred more frequently than the permit requirement for the stormwater activities, such as when stormwater construction inspections for Santa Clarita were performed at every construction permit inspection and these permit inspections occurred more frequently than the permit requirement.

Description of Alternatives for Control of Stormwater Quality (Task B)

The alternatives for control of stormwater quality focus on source control and runoff reduction. The principle strategy for runoff reduction is by infiltration and evapotranspiration, using common BMPs. Based on this approach, costs for two scenarios are estimated for the area under LARWQCB jurisdiction. One scenario assumes source control BMPs are sufficient to comply with regulations. The other scenario assumes treatment using wetlands and infiltration basins. Two costs were estimated for the treatment scenario based on two different sources of unit costs. These scenarios do not include advanced treatment costs. Equivalent annual costs per household were calculated to compare to cost estimates from other studies. Table 3 compares the cost estimates of the two scenarios to the estimated current stormwater cost for the Los Angeles area.

Current level of effort in the Los Angeles area has only made limited progress in implementing the scenarios described in Task B (Devinny, 2004). If there are cases where discharge from these BMPs still requires advanced treatment, the cost of stormwater treatment would be much less than if advanced treatment was solely used because runoff reductions would reduce the size of treatment plant requirements.

Table 3. Equivalent Cost Per Household For Task B Alternatives

Cost Scenario for the Los Angeles Area	Equivalent Annual Cost, $/household
Current Effort	18
Alternative to Advanced Treatment: Pollution Prevention Scenario (Present worth 2.8 billion)[1]	27
Alternative to Advanced Treatment: Wetlands and Infiltration Basins Scenario, calculated using cost per area (Present worth 5.7 billion)[1]	55
Alternatives to Advanced Treatment: Wetlands and Infiltration Basins Scenario, calculated using cost per capture volume (present worth 7.4 billion)[1]	71

1. Little progress has been made in implementing these scenarios (Devinny, pers. comm., 9/14/04). These costs may be added to the current effort if existing programs continue to be required. Costs based on Devinny et. al. (Appendix H), see Table G-6 for equivalent annual cost calculation.

Table 4 compares several cost estimates in terms of equivalent annual cost per household.

Table 4. Equivalent Annual Cost per Household Comparisons between California Cost Survey Results and Los Angeles Area Future Cost Estimates[1]

Range of Current Cost from the California Survey		Range of Cost Estimates for Alternatives for Control of Stormwater Quality[2]		Maximum TMDL Estimates[3]		Statewide Clean Water Willingness To Pay[4]
				Ballona Creek Metals	L.A. River Trash	
18	46	27	71	75	141	180

1. Calculations are presented in Appendix G and are based on the following sources for each column respectively: survey results in Section 9, Devinny et al (Appendix H), RWQCB, Los Angeles (2004), LARQCB (2001), and Larsen and Lew (2003).
2. Calculated from Task B in Appendix H. Low range is the cost for attaining full compliance using only source control. High range is the cost for attaining full compliance using only treatment BMPs (low tech) estimated on capture volume. It is estimated that this is in addition to the current level of spending in the Los Angeles area.
3. TMDL costs apply to all sources, not just MS4 stormwater sources.
4. Responses were not received from 40% of the mailed surveys. The survey question was for restoring water quality for all waters throughout the state from all impairment, not just within a city or region and not just for impairment from stormwater pollution.

The costs developed by Gordon et al. (2002) were based on capture, collection and advanced treatment of various percentages of the annual runoff volume. An annual runoff capture volume of 70 percent (0.5-inch storm) was selected to compare to the Los Angeles Standard Urban Stormwater Mitigation Plan (SUSMP) capture standards of around 85 percent (0.75-inches). Unfortunately, the next highest capture volume analyzed by Gordon was the 1.25-inch storm. The resulting equivalent annual cost per household using the 0.5-inch storm and assuming a treatment scenario of 65 large regional treatment plants is $459/household. This cost only estimates cost that the cities in Los Angeles County would incur, so they may not directly comparable to the total watershed costs developed in the Total Maximum Daily Load (TMDL) plans because TMDL costs are not restricted to stormwater quality control.

Since some advanced treatment may be required, the future cost will lie between the alternative scenarios estimate and the advanced treatment estimate. Based on the assumption used by the Devinny study, future costs for the Los Angeles area appear to hinge on the ability to reduce stormwater runoff volumes and on the ability to control pollutants through source control.

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1.1 BACKGROUND

The 1987 amendments to the federal Clean Water Act (CWA) added Section 402(p), which defined stormwater discharges from industrial activities and municipal systems as point sources subject to the National Pollutant Discharge Elimination System (NPDES) Permit Program. The CWA directed the United States Environmental Protection Agency (USEPA) to publish regulations to define the discharges subject to NPDES permits and to establish a framework for regulating these discharges. The stormwater regulations promulgated by USEPA established a two-phase approach for municipal systems. The first phase began in 1990 and addressed discharges from (MS4s) that serve populations greater than 100,000 people. The second phase began in 1999 and addressed discharges from MS4s that serve populations less than 100,000 and are located in urbanized areas. The State Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs) can apply the Phase I or Phase II rules to areas with smaller populations as needed to protect water quality.

The CWA and federal stormwater regulations require MS4s subject to NPDES permits to reduce the pollutants in stormwater discharges to the maximum extent practicable (MEP). The regulations require the implementation of best management practices (BMPs) to meet the MEP discharge standard. BMPs include both source controls and treatment measures. MS4s are to implement an effective combination of these BMPs to reduce pollutants in stormwater discharges. In California, MS4 permits also require permittees to reduce the discharge of pollutants so that water quality standards are met. However, the permits do not specify strict compliance with numeric water quality standards. Rather, the MS4 permits require the compliance with standards through an iterative approach. Permittees implement BMPs according to storm water management plans. (If the current level of effort does not achieve water quality standards, additional BMPs are implemented until compliance has been achieved).

The current costs to implement BMPs have been the basis for lawsuits and petitions challenging the California stormwater regulatory program. Additionally, some permittees contend that current MS4 permits necessitate the use of advanced water treatment to meet water quality standards, which would drastically escalate costs above current levels (Gordon, 2001). Neither the USEPA nor the SWRCB has estimated costs for the development and implementation of MS4 stormwater programs to achieve MEP. The SWRCB and RWQCBs wish to respond to the contention that the intent of the California stormwater program is to require all stormwater discharges to be treated with advanced treatment devices. This project addresses these issues through two tasks.

Task A – Documenting Stormwater Program Costs

Documenting costs of a subset of California MS4 stormwater programs that were identified by RWQCB staff as demonstrating meaningful progress toward MEP compliance will aid in approximating costs of permit compliance statewide. Making meaningful progress is considered implementing activities specifically presented in the SWMPs. Stormwater program expenditures by those municipalities were compiled. The cost data was analyzed and normalized to identify potential cost factors that can be used to estimate costs for other municipalities to achieve permit compliance. Although compliance with construction and industrial permits is discussed in stormwater permits, the compliance costs for these permits are not included in this report. This report does not address the benefits of permit compliance activities[1].

Only municipal costs are documented; total societal costs are not. There are additional costs borne by developers (passed onto homeowners), businesses, industries and residents that are not addressed in Task A. The Task A was accomplished by personnel from the Office of Water Programs at CSUS.

Task B – Alternative Approaches to Stormwater Quality Control

Task B is an assessment of regulatory policy to determine the intent of stormwater regulation regarding advanced treatment. Alternatives for stormwater quality control that are believed to comply with the intent of the regulations are described and costs are estimated for the Los Angeles Regional Water Quality Control Board (LARWQCB) area. The intent of the regulation was determined by speaking with LARWQCB staff and reviewing past regulatory action. Task B was accomplished by faculty from the University of Southern California and the University of California Los Angeles. This task assumes the MS4 permitting process as it stands presently, using an iterative process of enhancing implementation of BMPs. This scenario may overlap with the Total Maximum Daily Load (TMDL) process, but it is not necessarily the same since the TMDL process address pollution sources other than stormwater.

1.2 REPORT ORGANIZATION

Task A is addressed in Sections 2 through 9. Section 2 presents the methodology for gathering, analyzing, and presenting cost information. Sections 3 through 8 present the NPDES-related stormwater costs and other relevant characteristics for the six municipal areas surveyed. The raw cost data and description of how program costs were developed are shown in Appendices A through F. In Section 9, normalized costs for each major stormwater program element are presented and compared between cities. Explanations for the observed differences are also offered. Appendix G contains the backup calculations for Section 9. Section 10 presents

[1] A subcommittee of the California Stormwater Quality Association (CASQA) is working on developing guidelines for program effectiveness evaluation, which has an ultimate goal of quantifying changes in receiving water quality (the benefit) due to stormwater activities.

recommendations for further cost reporting and analysis. References are in Section 11. Task B is included as Appendix H.

The method for data collection, organization, and quality evaluation is presented in this section. Data sources are also described. Methodology and assumption for Task B are reviewed in the Executive Summary of the report found in Appendix H.

2.1 TECHNICAL ADVISORY GROUP

A technical advisory group (TAG) was formed to assist in the execution of this project. The TAG was comprised of one representative from USEPA, one from RWQCB, three from universities not associated with executing the study, one consultant, and one representative from the California Stormwater Quality Association (CASQA)[2]. TAG members reviewed and commented on each major phase of the study, including the initial city selection, initial scope of the study, initial results from the first city, and the interim draft report. A description of the TAG and their comments are included in Appendix K. The TAG did not review the work done for Task B (Appendix H).

2.2 CITY SELECTION

The following criteria were used in the selection process:

- nominated by RWQCB staff as having a good stormwater program,
- a variety of geographic and hydrologic areas within California,
- have a stormwater fund or equivalent that required the cities to track stormwater costs,
- a variety of populations, with at least one city below 100,000, and
- a variety of income per population or household.

Initial nominations and selection recommendations were presented in a memorandum to the SWRCB (Appendix I). Subsequent discussion with cities and RWQCB staff refined the list. One nominee, Corona, was considered after the memorandum was submitted. All the cities nominated for the inland area of Southern California were not able to participate, so the RWQCB then nominated Corona. Corona was not initially considered because of a lack of familiarity with the progress of their stormwater program. Subsequent review established Corona as a nominee.

The following municipalities were selected and agreed to participate in the cost survey:

- Corona
- Encinitas
- Fremont
- Fresno-Clovis Metropolitan Area
- Sacramento
- Santa Clarita

[2] CASQA is a non-profit organization with mostly municipality membership. CASQA advises the California SWRCB on stormwater issues.

The locations of the participating municipalities are shown in Figure 2-1.

2.3 COST SURVEY CATEGORIES

The Cost Survey Categories were based on the USEPA six minimum measures for Phase II stormwater programs because cities often report cost in annual reports for several of these categories (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm). The six categories initially considered in this study were:

- Public Education and Outreach,
- Public Involvement and Participation,
- Illicit Discharge Detection and Elimination (a.k.a. Illicit Connection and Illicit Discharge),
- Construction Site Stormwater Runoff Control,
- Post Construction Stormwater Management in New Development and Redevelopment, and
- Pollution Prevention and Good Housekeeping for Municipal Operations.

Figure 2-1. Location of Municipal Areas Selected for the Cost Survey

For several cities, Public Education and Outreach and the Public Involvement and Participation costs were not tracked separately. Consequently, differentiating costs between these two categories was often impractical. For these cities, these costs are reported in a "Public Education, Outreach, Involvement, and Participation" category.

Review of the stormwater permits of the selected cities and consultation with SWRCB staff resulted in these additional categories:

- Industrial and Commercial Management Programs,
- Overall Stormwater Program Management,
- Water Quality Monitoring, and
- Watershed Management.

The industrial and commercial management programs were combined because most of the selected cities did not differentiate between the costs associated with industrial sites and commercial sites.

The Watershed Management category includes costs associated with participation in total maximum daily load (TMDL) development processes and watershed management addressing

303(d)[3] pollutants. Most of the cities are not actively implementing TMDLs and costs reported in this category do not include TMDL implementation activities. Furthermore, existing TMDLs suggest stormwater compliance will be through enhancement to current permit compliance activities such as post-construction BMPs.

2.4 IDENTIFYING NEW, EXISTING, AND ENHANCED COSTS

All costs were identified as new, existing, or enhanced according to the extent that the activities existed before the first stormwater permit. New costs are for activities that are exclusively a result of compliance efforts with the stormwater permit. Existing costs are for activities that predated stormwater permits. Enhanced costs are for existing activities that were increased due to permit requirements. Enhanced costs are the total cost for impacted activities. It is not the increase in cost due to permit requirements. This number would have to be developed from 1990 baseline costs, and this is beyond the scope of this project.

2.5 DATA COLLECTION

Because costs for the 2003/2004 fiscal year were not available at the start of this survey, costs for the 2002/2003 fiscal year were collected.

Initially, a questionnaire was developed to facilitate the data collection effort. Questions were developed to capture cost data and descriptions of the stormwater program activities for each city. The questionnaire was organized by cost category and included questions for individual activities or BMPs within each cost category. The questionnaire was given to the city of Sacramento as a test case, but it proved difficult to use as the cost information and description of activities/BMPs available to city staff did not match well with those in the questionnaire. Consequently, the questionnaire was abandoned as the primary data collection tool, though it was shared with other cities as a guide to help staff understand what type of information was being sought.

The data collection methodology is depicted in Figure 2-2. City staff members were contacted by email and with follow-up telephone conversations in which the purpose and scope of the study were described. As mentioned above, a copy of the questionnaire was sent as guidance material. City staff then submitted cost and activity data in whatever format was available. The documents that usually contained the most useful information were the city's annual stormwater report, cost spreadsheets submitted by city staff, the NPDES stormwater permit, and SWMPs, or Stormwater Quality Improvement Plans (SQIPs), or Drainage Area Master Plans (DAMPs).

The next step was to fit the information provided into the cost survey categories. This wasn't always straightforward as there were significant differences among cities in the format and

[3] The term 303(d) pollutants are used here to describe the pollutants in specific waters for which TMDLs are being developed according to Section 303(d) of the CWA.

content of annual stormwater reports. For example, the annual stormwater report for one city was divided into two separate submittals, each covering one half of the year. The study team combined data from each section to represent the whole year. In another example, the annual stormwater reports of two cities did not contain costs. In these cases, cost and activity data was assembled from multiple alternate sources. After working through a variety of reporting formats, costs were allocated among the cost survey categories and entered into tables similar to Table 2-1. These tables were returned to the surveyed cities to give them an opportunity to comment on the allocation of costs. Follow up inquiries were also made when data was incomplete or missing. Data collection, cost allocation, and coordination with the surveyees' continued until all substantial questions were answered. Coordination with city staff members usually resulted in adjustments that more accurately accounted for those stormwater activities related to permit compliance.

Table 2-1. Example of Cost Information Collected for Each Cost Survey Category

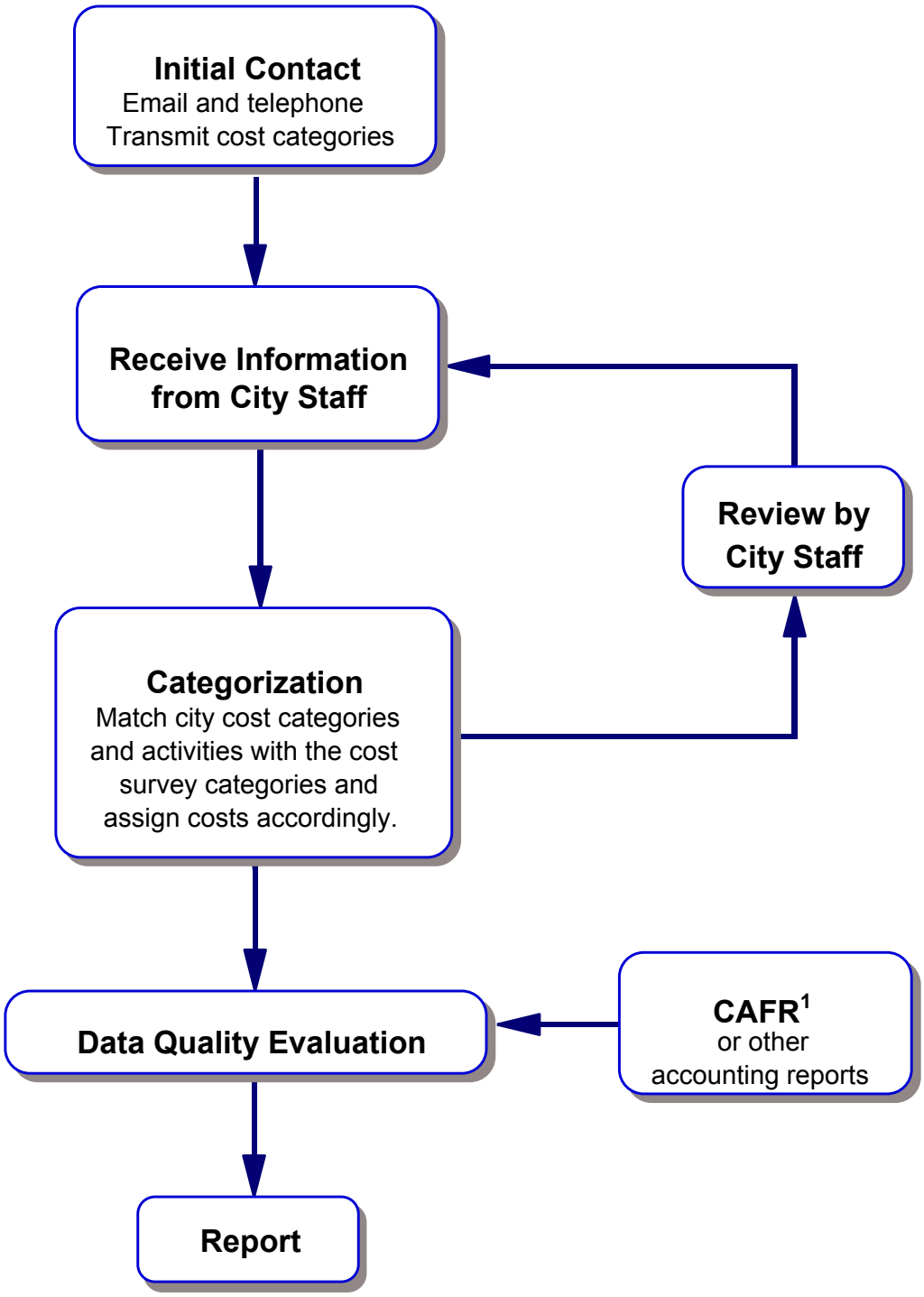
Cost Category: Construction Site Stormwater Runoff Control[1]

Activity Names	External Contract	Relation to Permit[2]	Dollar Amount	Activity Statistics	Notes or Units	
Activity 1						
Activity 2						
Activity 3						

1. This example format was repeated within the table for the other cost categories.
2. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

Information was also collected on cost factors that might explain observed differences in costs. These factors were used to "normalize" costs by dividing the cost by the cost factors (activity statistics). Some cost factors were physical characteristics such as population or area. These were collected from census sources, city websites, and through personal communication. Others cost factors, such as number of construction site inspections, reflected stormwater program activities. Cost factors specific to individual activities or cost categories were found in the annual stormwater reports or reported in personal communications from city staff. Identical cost factors were not available for every city because cities often tracked accomplishments differently. For example, one city counted miles of drainage channel cleaned while another measured the weight of trash and debris removed during channel cleaning. As with the costs, the activity statistics were verified by city staff before being entered into tables similar to Table 2-1 under the "Activity Statistics" column.

The TAG suggested that certain fines and penalties from enforcement of ordinances relating to stormwater compliance are available to offset the cost of stormwater programs. Examples include parking tickets to accommodate street sweeping, fines for littering, construction practice violations, commercial facility operations, etc. The net revenue associated with enforcement of city ordinances that support stormwater activities was not available, partly because the cost of enforcement and penalty collection by the municipalities for stormwater violations is not known. Regardless, this does not change the cost of compliance; enforcement only seeks to identify alternative funding sources.



1. CAFR: Comprehensive Annual Financial Report

Figure 2-2. Data Collection Methodology Flow Chart

2.6 DATA QUALITY EVALUATION

After data collection, an assessment was made to assign an appropriate level of confidence in the data. The following confidence levels and criteria were used:

High – Costs were submitted in the form of reports generated by city accounting systems.

Moderately High – Costs were submitted in spreadsheets or other written form and could be checked against stormwater cost entries in the city's Comprehensive Annual Financial Report[4] (CAFR), or other accounting system reports. If a city has established a fund to account for stormwater related financial transactions, confidence was determined by comparing the cost figures found in the CAFR (or accounting system reports) and the data submitted by city stormwater staff. The costs reported in the CAFR should not be less than the staff-reported costs because the CAFR may include costs for stormwater activities not required for permit compliance. If costs submitted by stormwater staff were higher than reported CAFR costs, the inconsistency reduces the level of confidence in the data and casts doubt on the accuracy of the submitted costs.

Moderate – Costs were submitted in spreadsheets or other written form, but comparisons with CAFR stormwater funds or other accounting system reports could not be made.

Low – Costs were submitted verbally through personal communication or major costs for required programs were not available or estimated.

The goal of the data evaluation process was to assign a single confidence level to a city's overall data set. In most cases all of the data submitted by city staff received the same level of confidence because the sources were similar in nature. Where there were differences in data quality because of different data sources, the overall quality was based on the quality of the data representing the majority of the costs. A judgment was also made on the completeness of the data. For example, if major costs are missing, the confidence would be low even though the quality of the data submitted might be high. A commentary on data quality is included in the report sections corresponding to each of the cities surveyed.

2.7 INHERENT LIMITATIONS

As in all cost surveys, this study contains some inherent limitations. The most important of these is the almost complete dependence by the study team on the city staff members to assure the accuracy and completeness of the data provided. While some checks were made against alternate sources (e.g., the CAFRs) and common sense, it was outside the scope of this project for the study team to independently check the quality of each city's stormwater accounting information. Errors can creep into any exercise of this kind. Inherent in the process of recording data are data entry errors such as mistyped numbers. Though unintentional, these errors are

[4] A CAFR is an annual report provides information regarding all funds and account groups under the jurisdiction of a government reporting entity.

sometimes not identified and resolved. Another potential source of error is an incomplete record. Sometimes things are forgotten and overall data quality suffers.

The study team thanks the staff members of the participating cities for their efforts to assure that the data provided are as correct and complete as possible. What errors may have crept into the data are certainly unintentional, and are not believed to be large enough to affect the major findings of the study.

2.8 DATA COMPARISONS TO OTHER STUDIES

A review of literature revealed several sources of cost information throughout the United States. The primary sources reviewed were the Rouge River Watershed project in Michigan, the National Association of Flood and Stormwater Management Agencies (NAFSMA) survey of Phase II municipalities, and the USEPA review of Phase I costs (USEPA, 2004). These costs are discussed in Section 9.6.

The city of Corona is a moderately-sized city located inland in southern California with a population of 124,966 (www.census.gov). It is traditionally an agricultural city. The city is in the Santa Ana River watershed at the junction of State Route 91 and Interstate 15. The stormwater program is coordinated by personnel from the Department of Public Works. Descriptive characteristics for Corona are shown in Table 3-1. Primary personal communication was with Michele Colbert from the city of Corona. The city of Corona costs for 2002/2003 were for complying with their 2002 stormwater permit (RWQCB, Santa Ana, 2002).

Table 3-1. Select Characteristics of the City of Corona

Description	Characteristic	Reference
Mean Income Per Person, $	21,001	www.census.gov
Area, (sq. miles)	35	www.census.gov
Population	124,966	www.census.gov
Curb Miles Swept	20,877	Colbert, pers. comm., 3/12/04
Active Construction Sites	41	Colbert, pers. comm., 3/12/04
Industrial and Commercial Sites	3,050	Colbert, pers. comm., 3/12/04
Households	39,271	www.census.gov
City Actual General Fund Revenue, $	78,413,063	Corona, 2003a.
Annual Rainfall (cm)	29	www.wrcc.dri.edu
Years Since Incorporation	108	www.ci.corona.ca.us

3.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

A spreadsheet was provided from the city of Corona, which included labor and direct cost information for their stormwater program broken down into different categories by activity (Appendix A, Table A-2). This spreadsheet contained the majority of the city's stormwater program cost. Also, spreadsheets containing cost and other data were submitted for street sweeping and hazardous materials pick-up such as spills from vehicles involved in accidents. (Appendix A, Tables A-10 and A-11).

City of Corona Santa Ana Watershed Annual Reporting Forms 2002/03

This report provided activity statistics (e.g. curb miles swept) for various city stormwater programs. These statistics were used to normalize costs to allow comparison with other cities.

Personal Communication: Interviews, Phone Calls, E-Mail

Personal communication with city of Corona staff provided additional stormwater program costs that augmented the data submitted in their cost spreadsheet. Through personal communication, city staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories.

Comprehensive Annual Financial Report (CAFR) 2002/03

The city of Corona has not established a fund to account for overall stormwater transactions, therefore no cost comparisons were made to CAFR figures.

Santa Ana Regional Drainage Area Management Plan (SAR-DAMP) 1993

This document describes the overall stormwater management strategies planned by the municipalities in the Santa Ana drainage area of Riverside County (Corona SAR-DAMP). While no cost figures were obtained from this document, it was used to verify that an activity was required by the permit.

3.2 COST DATA SUMMARY

Table 3-2 summarizes the costs for each survey category. Figure 3-1 shows the relative distribution of costs among the categories. Stormwater staff labor costs were not distributed among survey categories, but were 100 percent allocated to the Overall Stormwater Program Management category. This will make Overall Stormwater Program Management costs appear higher compared to cities that allocate stormwater staff costs to their various programs. According to city staff, the industrial stormwater program is just getting started so costs of that program probably do not represent a mature industrial program (Colbert, personal communication, 3/12/04).

Table 3-2. City of Corona Cost Assigned to Cost Survey Categories

Cost Survey Category	*Costs ($)*
Construction Site Stormwater Runoff Control	53,382
Illicit Discharge Detection and Elimination	20,628
Industrial and Commercial Management Programs	89,916
Overall Stormwater Program Management	317,800
Pollution Prevention and Good Housekeeping for Municipal Operations	720,222
Post Construction Stormwater Management in New Development and Redevelopment	13,509
Public Education, Outreach, Involvement, and Participation	28,409
Water Quality Monitoring	7,000
Watershed Management	0
Total	**1,250,866**

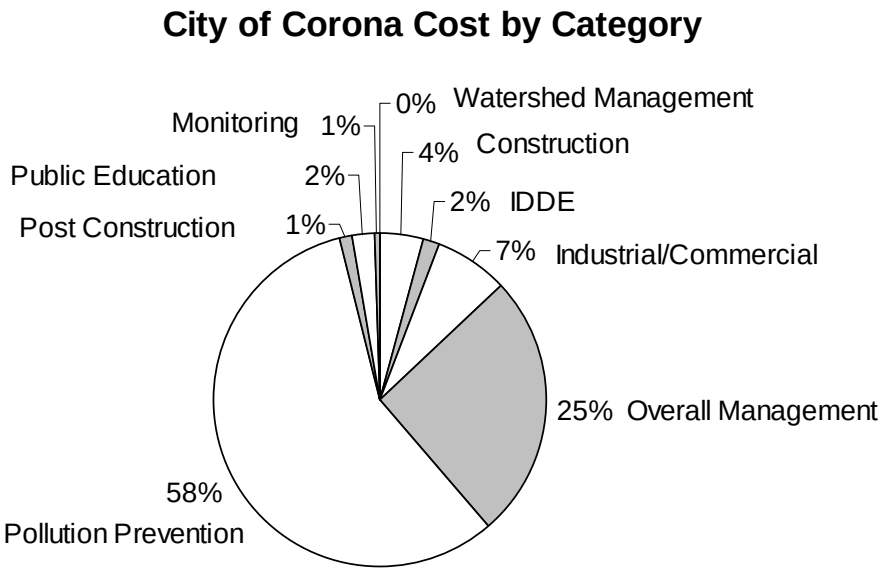


Figure 3-1. Distribution of Corona Stormwater Costs among the Cost Survey Categories.

3.2.1 Discussion of Costs for Each Survey Category

This section presents the major activities for each cost survey category. Further cost breakdown and calculations for each survey category are included in Appendix A. The costs for each survey category are discussed in this section in alphabetical order.

Construction Site Stormwater Runoff Control

The construction program cost was $53,382, which was 4 percent of total stormwater cost. The construction program oversaw 41 active construction sites and performed 564 inspections (Colbert, personal communication, 3/12/04). Including the cost for vehicles, phone usage, training, and stormwater staff labor, the average cost was $95 per inspection and $1,302 per active construction site.

Illicit Discharge Detection and Elimination (IDDE)

The IDDE program cost was $20,628, which was 2 percent of total stormwater cost. The largest cost attributed to this program was for the stormwater share of inspections performed by wastewater staff. The average cost per inspection was $157. Also, new development illicit connection inspections were conducted, which added to the cost of this program (Colbert, personal communication, 3/12/04).

Industrial and Commercial Management Programs

The industrial and commercial program cost was $89,916, which was 7 percent of total stormwater cost. The industrial program had 600 inspections at an average cost of $134 per inspection.

Overall Stormwater Program Management

The overall management program cost was $317,800, which was 25 percent of total stormwater cost. The city was unable to distribute the staff cost among the cost survey categories so all of the stormwater staff cost was assigned to this category. Administrative service charges account for 25 percent of this category's cost. The staff costs represent approximately 62 percent of the costs assigned to this category and 16 percent of total stormwater cost. The remaining 23 percent are for office supplies, reporting, and NPDES fee.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $720,222, which was 58 percent of total stormwater cost. The two primary activities in this category were street sweeping and drain line/channel cleaning. The average cost was $20 per curb mile swept and $8 per linear foot of drain lines and channels cleaned. Street sweeping and drain line and channel cleaning account for 33 percent and 20 percent of total stormwater cost respectively. City staff labor associated with these activities is reported in this category.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $13,509, which was 1 percent of total stormwater cost. Post construction cost was primarily for professional consulting services for BMP selection. Also, installation and maintenance of 8 storm drain inlet inserts cost $4,500, averaging $562 per insert per year.

Public Education, Outreach, Involvement, and Participation

The public education program cost was $28,409, which was 2 percent of total stormwater cost. Public education and outreach activities often incorporated public involvement and participation activities. This made differentiating cost between the categories impractical. Because of this, the two programs were combined.

Water Quality Monitoring

The monitoring program cost was $7,000, which was 0.6 percent of total stormwater cost. This cost was associated with the illicit discharge detection and elimination program.

The city of Corona did not allocate any cost to this category. The effort was captured under other programs such as Overall Stormwater Program Management.

3.3 CONFIDENCE IN THE DATA

For the city of Corona, confidence in the data was moderate because most of the cost data submitted was via spreadsheets built, maintained, and updated by the city. However, as with most of the cities selected, the program costs provided could not be verified by city accounting system reports.

Since the city did not have a fund in place to account for overall stormwater related transactions, comparison of stormwater costs submitted by city staff with CAFR cost figures was not possible. This limited the level of confidence in the data to 'moderate.'

The city of Encinitas represents the smallest city selected for the survey with a population of just over 58,000 (www.census.gov). The area of the city is about 20 square miles and is located 25 miles north San Diego. Encinitas is situated along six miles of rugged coastline; characterized by beaches, cliffs, and rolling hills (www.ci.encinitas.ca.us). The stormwater program is coordinated by the Engineering Services Department. Descriptive characteristics for the Encinitas are shown in Table 4-1. Primary personal communication was with Kathy Weldon from the city of Encinitas and Meleah Ashford of Ashford Engineering. The city of Encinitas costs for 2002/2003 were for complying with their 2001 stormwater permit (RWQCB, San Diego, 2001).

Table 4-1. Select Characteristics of the City of Encinitas

Description	Characteristic	Reference
Mean Income Per Person, $	34,336	www.census.gov
Area (sq. miles)	20	www.census.gov
Population	58,014	www.census.gov
Curb Miles Swept	5,832	Encinitas, 2003b
Active Construction Sites	40	Encinitas, 2003b
Industrial and Commercial Sites	417	Encinitas, 2003b, Weldon, pers. comm., 4/2/04
Households	23,843	www.census.gov
City Actual General Fund Revenue, $	42,592,755	Encinitas, 2003a
Annual Rainfall (cm)*	26	www.wrcc.dri.edu
Years Since Incorporation	20	www.ci.encinitas.ca.us
*Rainfall for Oceanside Marina was used.		

4.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

A spreadsheet was provided by the city of Encinitas that included cost information broken down by activity (Appendix B, Table B-2). The city also submitted another spreadsheet, which allocated the labor, supplies, travel, equipment, and vehicle cost to each stormwater program (Appendix B, Table B-3). The remaining cost data submitted was for public works department costs related to stormwater activities (Appendix B, Table B-4).

Jurisdictional Urban Runoff Management Program (JURMP) Annual Report, FY 2002-2003

This report provided descriptions of the activities and accomplishments of the city's stormwater program (Encinitas, 2003b). Activity statistics (e.g. number of industrial inspections) were provided in this report as well. Stormwater costs were normalized by these statistics. While no

cost figures were obtained from this document, it was used to verify that an activity was required for compliance with the permit.

Personal Communication: Interviews, Phone Calls, E-mail

Personal communication with the city of Encinitas staff provided additional stormwater program costs that augmented the data submitted in their cost spreadsheet. These costs were for stormwater activities performed by the department of public works. They also provided allocations of labor, supplies, travel, equipment, and vehicle to cost survey categories based on estimated percentages. Also, city staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories.

Comprehensive Annual Financial Report (CAFR) 2002/03

The city of Encinitas has not established a fund to account for overall stormwater transactions, so no comparisons on cost were made to CAFR figures. During fiscal year 2003/04, the city has since created such a fund (Ashford, personal communication, 4/2/04).

4.2 COST DATA SUMMARY

Table 4-2 summarizes the costs for each survey category. Figure 4-1 shows the relative distribution of costs among the categories. The costs in Table 4-2 include an allocation of stormwater staff time used to develop, oversee, and, in some cases, implement activities within each program.

The backup calculations and source data for these costs are presented and discussed in Appendix B.

Table 4-2. City of Encinitas Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	169,751
Illicit Discharge Detection and Elimination	49,378
Industrial and Commercial Management Programs	65,596
Overall Stormwater Program Management	128,159
Pollution Prevention and Good Housekeeping for Municipal Operations	528,252
Post Construction Water Management in New Development and Redevelopment	15,344
Public Education, Outreach, Involvement, and Participation	41,898
Water Quality Monitoring	76,262
Watershed Management	12,400
Total	**1,087,038**

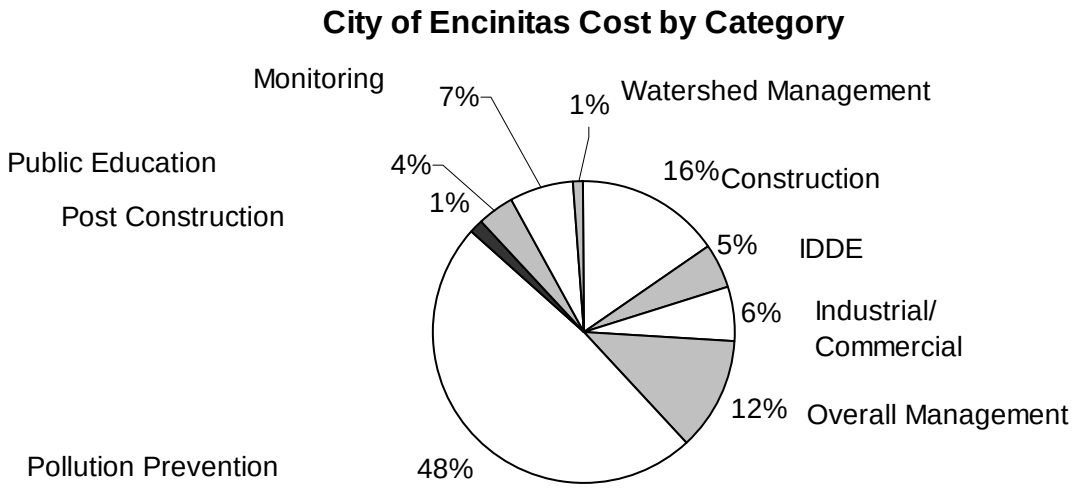


Figure 4-1. Distribution of Encinitas Stormwater Costs Among the Cost Survey Categories.

4.2.1 Discussion of Costs for Each Survey Category

Cost breakdown and calculations for each survey category are found in Appendix B, Table B-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program cost was $169,751, which was 16 percent of total stormwater cost. The construction program oversaw 40 active construction sites and performed 401 inspections (Encinitas, 2003b). Including the cost of stormwater staff for oversight and follow-up activities, the average cost was $423 per inspection and $4,244 per active construction site. The normalized cost for Encinitas may be high compared to other cities because the cost includes non-inspection activities such as contractor and inspector training, wet weather monitoring, and BMP manual updating. Stormwater staff also reviewed five SWPPPs, performed general enforcement, issued 13 notices of violation, updated the city BMP manual, educated and trained engineering inspectors with regard to stormwater management and BMP implementation, monitored weather patterns and storms in the Pacific through the National Weather Service, conducted construction education, disseminated brochures and mailings, and held a construction workshop (City of Encinitas, 2003b).

Illicit Discharge Detection and Elimination

The IDDE program cost was $49,378, which was 4 percent of total stormwater cost. The IDDE program conducted 172 education, enforcement, and/or clean-up activities. Using overall IDDE

cost, the average cost per activity was $287. From informal visual inspections, city staff received 76 "complaints," and another 96 complaints were received via the city's stormwater hotline.

Industrial and Commercial Management Programs

The industrial and commercial program cost was $65,596, which was 6 percent of total stormwater cost. This program had 266 inspections at an average cost of $247 per inspection. The normalized cost for Encinitas may be high compared to other cities because the cost includes non-inspection activities such as website updating, facility inventory, education, and enforcement actions (City of Encinitas, 2003b). The city has three industrial sites and 348 commercial sites. Stormwater staff updated the commercial facility inventory, provided BMP manuals and guidance, educated facility staff in regard to stormwater requirements and minimum BMPs, developed a grease program, and issued several enforcement actions (City of Encinitas, 2003b).

Overall Stormwater Program Management

The overall management program cost was $128,159, which was 12 percent of total stormwater cost. Developing a "clean water fee" cost $35,000 (Weldon, personal communication, 4/2/04). This fee pays for stormwater costs and is similar to stormwater fees assessed by other cities. This cost accounts for approximately 27 percent of this category's cost. The other activities in this program were annual reporting and legal support for developing ordinances and plaintiff attorney fees. Costs in this category identified as possibly one-time were for the stormwater fee development, legal fees (ordinances and plaintiff attorneys), and grant writing.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $528,252, which was 49 percent of total stormwater cost. This category had three primary public works activities: cleaning sumps, inlets, and manholes; street sweeping; and cleaning drain lines and channels. Activity statistics were only available for street sweeping which was contracted out with minimal oversight (Weldon, personal communication, 4/2/04). The average cost was $20 per curb mile swept. The street sweeping cost is about 11 percent of total stormwater cost. Street sweeping cost does not include labor of the stormwater staff. This was because stormwater staff time was allocated to all municipal operations for stormwater and not to individual activities (e.g. street sweeping vs. channel cleaning). Other activities included in this program were trash pick-up, sediment disposal, and consulting services for oversight, strategic planning, and management.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $15,344, which was 1 percent of total stormwater cost. Post-construction cost was primarily for consulting and oversight of a special project to treat discharge to Moonlight Beach for bacteria. Also, installation and maintenance of 16 storm drain inserts cost $1,908, averaging $119 per insert per year. The cost associated with the "Moonlight Beach" project was possibly a one-time cost.

Public Education, Outreach, Involvement, and Participation

The public education program cost was $41,898, which was 4 percent of total stormwater cost. Public education and outreach activities often incorporated public involvement and participation activities. This made differentiating cost between the categories impractical. Because of this, the two programs were combined. The city of Encinitas had three watershed and beach clean-up activities (City of Encinitas, 2003b). Because the cost of outreach was not available separately and impression statistics were not available, outreach costs were not normalized.

Water Quality Monitoring

The monitoring program cost was $76,262, which was 7 percent of total stormwater cost. The cost was for collection, analysis, and contractor oversight of 48 dry weather bacteria samples (Weldon, personal communication, 4/2/04).

Watershed Management

The cost of this category was $12,400, which was 1 percent of total stormwater cost. These costs were for developing a one time watershed plan and participating in and hosting regional watershed meetings and workshops (Weldon, personal communication, 4/2/04).

4.3 CONFIDENCE IN THE DATA

For the city of Encinitas, confidence in the data was moderately high. This was because only a few cost figures submitted were verbal estimates without backup. Most of the cost data submitted was via spreadsheets built, maintained, and updated by the city. However, as with most of the cities selected, the program costs were provided but could not be verified by city accounting system reports.

For the fiscal year 2002/03, the city did not have a fund in place to account for overall stormwater related transactions. As such, comparison of stormwater costs submitted by city staff with CAFR cost figures was not possible, which did not allow for a higher level of confidence in the data.

Fremont was the third largest city selected and has a population of about 203,000 (www.census.gov). The city is located in Alameda County on the southeast side of the San Francisco Bay between San Jose and Oakland. The stormwater program is coordinated by the Environmental Services Department. Descriptive characteristics for Fremont are shown in Table 5-1. Primary personal communication was with Barbara Silva from the city of Fremont. The FCMA costs for 2002/2003 were for complying with their 2003 stormwater permit (RWQCB, San Francisco Bay, 2003).

Table 5-1. Select Characteristics of the City of Fremont

Description	Characteristic	Reference
Mean Income Per Person, $	31,411	www.census.gov
Area, (sq. miles)	97	Silva, pers. comm., 4/5/04
Population	203,413	www.census.gov
Curb Miles Swept	31,405	Silva, pers. comm., 9/22/04
Active Construction Sites	24	Silva, pers. comm., 4/5/04
Industrial and Commercial Sites	1,028	Silva, pers. comm., 4/5/04
Households	69,452	www.census.gov
City Actual General Fund Revenue, $	98,456,011	Fremont, 2003a
Annual Rainfall (cm)	37	www.wrcc.dri.edu
Years Since Incorporation	48	www.ci.fremont.ca.us

5.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

The city of Fremont provided a cost spreadsheet that included labor and cost figures for stormwater activities (Appendix C, Table C-2). A further breakdown of one of these cost figures was also provided (Appendix C, Table C-3). A further breakdown of Union Sanitation District[5] (USD) cost is presented in Appendix C, Table C-4. Appendix Table C-5 presents a breakdown of city of Fremont contributions to the Alameda Countywide Clean Water Program (ACCWP).

Alameda Countywide Clean Water Program Fiscal Year 2002/03 Annual Report

The city of Fremont is a member of the ACCWP, so the 2002/03 Annual Report was consulted to obtain activity statistics, descriptions of activities, and accomplishments specifically pertaining

[5] The Union Sanitation District is a special district that provides wastewater collection, treatment and disposal services to the residents and businesses of the city of Fremont, Newark and Union City, in Southern Alameda County in California (www.unionsanitary.com).

to the city of Fremont. As with other cities where relevant activity statistics were available, cost normalization was performed.

Personal Communication: Phone Calls, E-mail

Through personal communication, city staff provided detailed information regarding cost figures. City staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories.

Comprehensive Annual Financial Report (CAFR) 2002/03

During the 2002/03 fiscal year, the city of Fremont had a fund in place to account for overall stormwater related transactions. This fund is called the "Urban Runoff/Clean Water" fund (Fremont, 2003a). The cost figures in this fund were used for comparison purposes with costs submitted by city stormwater staff.

Alameda Countywide Clean Water Program, SWMP, July 2001-June 2008

The SWMP provided information regarding the structure, accomplishments, and recent developments of the program. It also gave information regarding objectives and tasks of each program component and specific tasks that the member agencies are required to perform (Fremont, 2003c). While no cost figures were obtained from this document, it was used to verify that an activity was required for compliance with the permit.

5.2 COST DATA SUMMARY

Table 5-2 summarizes the costs for each survey category. Figure 5-1 shows the relative distribution of costs among the categories. Stormwater staff labor costs for the city of Fremont were not distributed among survey categories, but were allocated to Overall Stormwater Program Management. This will make the costs in this category appear higher compared to cities that allocate stormwater staff costs to their various programs. Survey categories (excluding Overall Stormwater Program Management) that include costs or discussion in regard to "stormwater staff labor" only concerns ACCWP labor cost allocated to the city of Fremont. Fremont funded the USD to accomplish portions of the IDDE, industrial/commercial, construction, overall management, and public education programs.

Table 5-2. City of Fremont Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	17,715
Illicit Discharge Detection and Elimination (IDDE)	5,917
Industrial and Commercial Management Programs	210,027
Overall Stormwater Program Management	453,872
Pollution Prevention and Good Housekeeping for Municipal Operations	2,128,175
Post Construction Stormwater Management in New Development and Redevelopment	35,083
Public Education, Outreach, Involvement, and Participation	101,717
Water Quality Monitoring	131,326
Watershed Management	17,610
Total	**3,101,442**

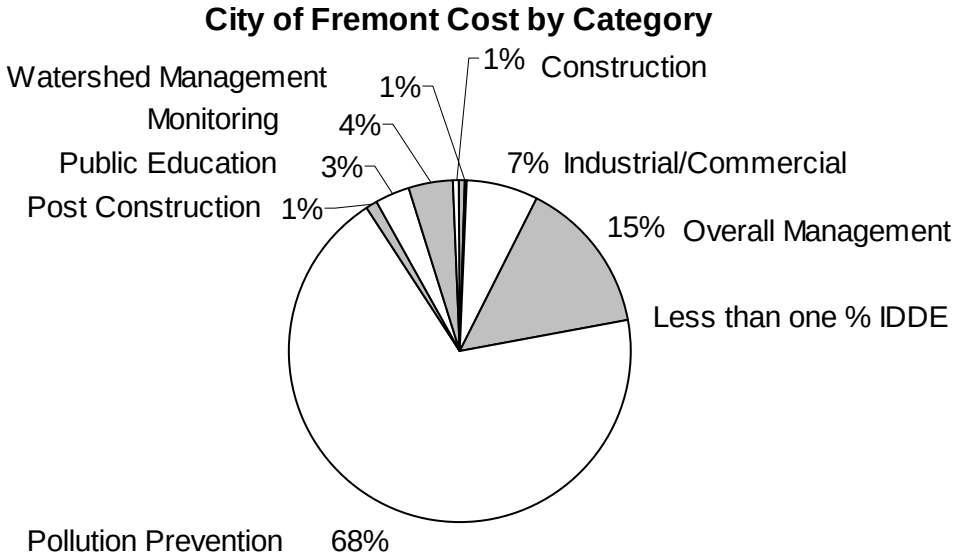


Figure 5-1. Distribution of Fremont Stormwater Costs Among the Cost Survey Categories.

5.2.1 Discussion of Costs for Each Survey Category

Cost breakdown and calculations for each survey category are found in Appendix C, Table C-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program (performed by USD), cost was $17,715, which was 1 percent of total stormwater cost. The construction program oversaw 24 active construction sites equal to or greater than five acres (Silva, personal communication, 4/5/04). All of the cost for the program was attributable to inspections (Silva, personal communication, 4/5/04). The program cost,

normalized by construction sites, was $738 per active construction site greater than or equal to five acres.

Illicit Discharge Detection and Elimination

The IDDE program cost was $5,917, which was less than one percent of total stormwater cost. Most of the cost (86 percent) was for assistance to eliminate non-stormwater discharges and reporting. Stormwater staff labor cost represented the remaining 14 percent.

Industrial and Commercial Management Programs

The industrial and commercial program cost was $210,027, which was 7 percent of total stormwater cost. This program was performed by the USD, who performed 482 inspections with 91 follow-up actions of which 81 were enforcement actions. Not including documentation cost, the cost per inspection was $334.

Overall Stormwater Management Program

The overall management program cost was $453,872, which was 15 percent of total stormwater cost. Stormwater staff labor costs are included in this category. The labor costs (including overhead) represent about 69 percent of the cost attributed to this program. The other costs were for administrative services and supplies, permit fees, informational systems, and USD services.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $2,128,175, which was 69 percent of total stormwater cost. The two primary activities of this category were street sweeping, and litter and debris removal. The average cost was $61 per curb mile swept. For this category, street sweeping accounted for approximately 90 percent of the cost and 9 percent was attributable to litter debris and removal. Other activities performed by the city included cleaning drain lines and channels, inlets, cross culverts, and conduits, but costs were not available for these activities.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $35,083, which was 1 percent of total stormwater cost. This cost was for engineering, planning, and other city staff to research, track, and report information for the annual stormwater report. It was also for task force meetings to develop strategies for compliance with their permit regarding new development and redevelopment, brochure printing, and stormwater staff labor.

Public Education, Outreach, Involvement, and Participation

The public education program cost was $101,717, which was 3 percent of total stormwater cost. Program activities included production and distribution of citywide newsletters, 28 school outreach presentations, stormwater staff participation in public events, and distribution of

brochures and fliers (Fremont, 2003b). USD was funded $25,897 to provide additional public education outreach services. Outreach materials promote an Integrated Pest Management program that provided businesses and nurseries with shelf displays and fact sheets.

Water Quality Monitoring

The monitoring program cost was $131,326, which was 4 percent of total stormwater cost. This cost was for multiple water quality sampling at two locations. Both chronic and acute toxicity tests were performed (Silva, personal communication, 4/5/04).

Watershed Management

The watershed management program cost was $17,610, which was 1 percent of total stormwater cost. Costs in this category were for developing a watershed study framework, assessment of pilot project activities, and stormwater staff labor (including overhead).

5.3 CONFIDENCE IN THE DATA

For the city of Fremont, confidence in the data was moderately high. Most of the cost data submitted was via spreadsheets built, maintained, and updated by the city. Approximately one-third of the city costs could be corroborated by the 2003/2004 CAFR figures.

The city of Fremont had a fund (Urban Runoff/Clean Water) presented in the CAFR that accounted for stormwater expenditures except street sweeping and litter/debris removal (Cote, 2004). Total expenditures and transfers out for the Urban Runoff/Clean Water fund were $1,234,790. Total stormwater costs submitted by city staff were $3,101,442 but this included $2,115,000 in street sweeping and litter/debris removal costs (Cote, 2004). Subtracting out $2,115,000 leaves $986,442 in stormwater costs compared to the $1,234,790 in the Urban Runoff/Clean Water fund. Because of water conveyance projects, it is expected that compliance costs would be less than this fund reports. The $2,115,000 could not be verified by CAFR figures because it was financed out of larger funds that did not have available breakdown. This cost was about 68 percent of the total stormwater cost.

The Fresno-Clovis Metropolitan Area (FCMA) has a population of 778,000, but a population of nearly 695,000 is used for comparison of normalized costs because this is approximately the population under the jurisdiction of the Fresno Metropolitan Flood Control District (FMFCD), which is the lead agency for compliance efforts. The FCMA is the largest area considered in this cost survey. Fresno is located in the San Joaquin Valley near the Sierra Nevada. Surrounded by agricultural land, the area includes the city of Fresno, the city of Clovis, and other metropolitan areas of Fresno County. The stormwater program is coordinated by the Environmental Services Department. Descriptive characteristics for FCMA and the other agencies, excluding California State University, Fresno (CSUF) are shown in Table 6-1. Primary personal communication was with Daniel Rourke and David Pomaville from the FMFCD. The FCMA costs for 2002/2003 were for complying with their 2002 stormwater permit (RWQCB, Central Valley, 2002a).

Table 6-1. Select Characteristics of the Fresno Metropolitan Area

Description	Fresno-Clovis Area	City of Clovis	County of Fresno	City of Fresno	Reference
Mean Income Per Person, $	*	18,690	15,495	15,010	www.census.gov
Area, (sq. miles)	*	17	6,017	105	www.census.gov
Population	561,120	68,468	65,000***	427,652	www.fresnofloodcontrol.org
Curb Miles Swept	142,411	47,430	21	94,495	FMFCD, 2003b
Active Construction Sites	N/A	N/A	N/A	N/A	N/A
Industrial and Commercial Sites	N/A	N/A	N/A	N/A	N/A
Households**	195,311	25,250	21,036	149,025	www.census.gov
City Actual General Fund Revenue, $	216,089,323	37,707,095	0	178,382,228	Respective CAFRs
Annual Rainfall (cm)	28	28	28	28	www.wrcc.dri.edu
Years Since Incorporation	119	92	N/A	119	www.ci.fresno.ca.us

* Approximately equal to county.
**County of Fresno number of households obtained by dividing the population covered by the stormwater permit by the average number of households in the county according to census 2000. Population provided via personal communication (Pomaville, 6/10/04).
*** County population is only that portion outside the cities but also covered by the FMFCD.

6.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

The FMFCD provided a spreadsheet generated from an accounting system report. This detailed spreadsheet provided individual expenditures for stormwater except for labor and office supplies (Appendix D, Table D-7).

Fresno-Clovis Storm Water Quality Management Program, Annual Report FY 2002/2003

This report provided descriptions of the activities and accomplishments of the stormwater program. Activity statistics (e.g. number of construction site inspections) were provided in this report, but in most cases numbers were not available for each agency.

Fresno-Clovis Storm Water Quality Management Program (SWQMP), February 1999

The SWQMP presents information regarding objectives and tasks of each program component and specific tasks that the member agencies are required to perform. The report contained budgeted costs incurred by the cities, county, and university in lieu of actual expenditures. These costs were summarized in Appendix D, Table D-3. The cost figures were budgeted amounts and not actual expenditures. The document was also used to verify that an activity was required for compliance with the permit.

Personal Communication: Phone Calls, E-mail

Personal communication with the FMFCD staff provided additional stormwater program costs that augmented the data submitted in their cost spreadsheet. These costs were for labor, office supplies, and street sweeping (Appendix Table D-8). They also provided advice on how to allocate the submitted costs to the cost survey categories. FMFCD staff also advised on where the best available costs were compiled for the other agencies.

Comprehensive Annual Financial Report (CAFR) 2002/03 for the FMFCD, City of Clovis, City of Fresno, and County of Fresno

Except for the FMFCD, the Fresno area agencies had not established a fund to account for overall stormwater transactions, so no comparisons on cost were made to CAFR figures. The CAFR figures were used to determine the general fund revenue, which is considered a potential cost factor.

6.2 COST DATA SUMMARY

Table 6-2 summarizes the stormwater program costs for each cost survey category. Figure 6-1 shows the relative distribution of costs among the categories. Labor cost for the FMFCD staff to develop, oversee, and administer these programs was allocated to the Overall Stormwater Program Management category. The labor costs for the other agencies were allocated to the cost categories.

Table 6-2. Fresno-Clovis Metropolitan Area Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	81,800
Illicit Discharge Detection and Elimination (IDDE)	13,176
Industrial and Commercial Management Programs	47,780
Overall Stormwater Program Management	570,495
Pollution Prevention and Good Housekeeping for Municipal Operations	2,240,605
Post Construction Stormwater Management in New Development and Redevelopment	57,539
Public Education, Outreach, Involvement, and Participation	210,716
Water Quality Monitoring	252,918
Watershed Management	0
Total	**3,475,029**

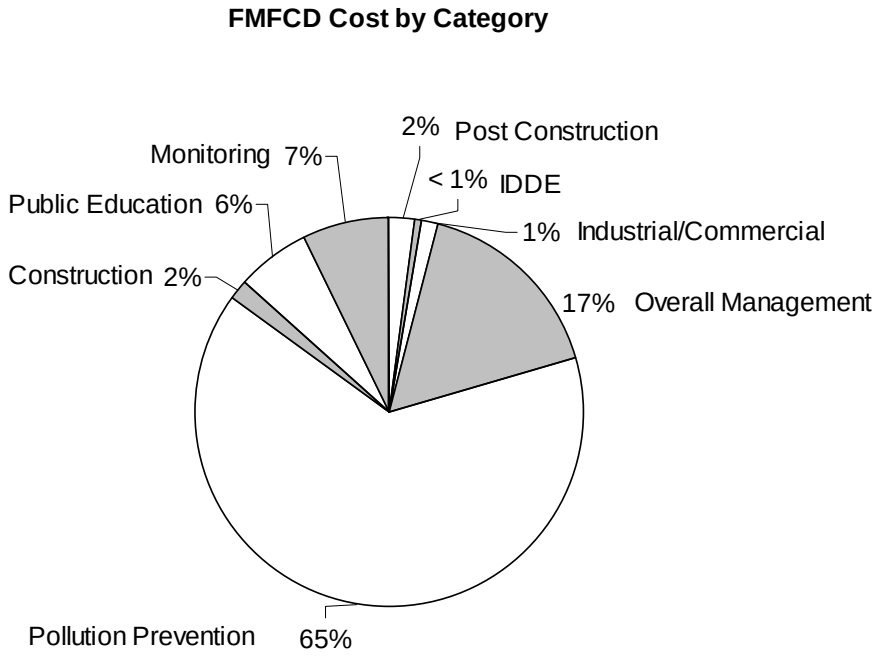


Figure 6-1. Distribution of Fresno-Clovis Metro Area Stormwater Costs Among the Cost Survey Categories

6.2.1 Discussion of Costs for Each Category

Cost breakdown and calculations for each survey category are found in Appendix D, Table D-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program cost was $81,800, which was 2 percent of total stormwater cost. The annual stormwater report did not contain the number of inspections for the city of Fresno, so cost could not be normalized by this factor. The number of construction sites was only tracked for the FMFCD so this factor was not used. (FMFCD, 2003b).

Illicit Discharge Detection and Elimination (IDDE)

The IDDE program cost was $13,176, which was less than one percent of total stormwater cost. The number of inspections was not available.

Industrial and Commercial Management Programs

The industrial and commercial program cost was $47,480, which was 1 percent of total stormwater cost. Facilities in the Fresno-Clovis metropolitan area are primarily inspected by Fresno County hazardous waste inspectors, city of Fresno industrial wastewater inspectors, and city of Clovis fire inspectors (FMFCD, 2003b). The number of inspections was only available for the FMFCD so cost could not be normalized on this factor.

Overall Stormwater Program Management

The overall stormwater program management cost was $570,495, which was 16 percent of total stormwater cost. This cost includes the FMFCD staff costs for stormwater (does not include other FMFCD activities such as flood control), which accounted for 98 percent of the cost of this category. The staff costs attributed to stormwater activities were estimated as 11 percent of the total personnel expenses for the FMFCD. The same percentage was applied to obtain office administration costs (Pomaville, 2004). Other costs were for office expenses, office administration, training, and travel.

Pollution Prevention and Good Housekeeping for Municipal Operations

The cost of this program was $2,240,605, which was 64 percent of total stormwater cost. This includes $2,193,296 reported by the city of Clovis and city of Fresno for street sweeping 141,769 of the 142,411 curb miles swept by the agencies (FMFCD, 2003b).

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $57,539, which was 2 percent of total stormwater cost. This cost was for contracting for maintenance of 8 basins, resulting in an average annual cost of $7,200 per basin.

Public Education, Outreach, Involvement, and Participation

The cost of this program was $210,716, which was 6 percent of total stormwater cost. The Public Education and Outreach category was combined with the Public Involvement and Participation category because the county of Fresno and city of Clovis costs were combined (FMFCD, 1999). There was not a consistently reported activity statistic that could be used for normalization. FCMA agencies were involved in many outreach and participation activities such as public service announcements, brochures, BMP fact sheets, volunteer stenciling, special events, articles, clean-up activities, hotline, school programs, and business outreach (FMFCD, 2003b).

Water Quality Monitoring

The monitoring program cost was $252,918, which was 7 percent of total stormwater cost. The program funded monitoring plan development, sample collection, analysis, reporting, and a Water Environment Research Foundation (WERF) contribution. Only FMFCD reported monitoring costs.

Watershed Management

The Fresno area agencies did not allocate any cost to this category. This effort was captured under other programs such as Overall Stormwater Program Management.

6.3 CONFIDENCE IN THE DATA

For the Fresno-Clovis metropolitan area, confidence in the data was moderate because costs for the other agencies were taken from budgeted numbers out of the SWQMP (FMFCD, 1999). Additionally, baseline labor costs for the cities and county were less than $90,000 (Appendix D, Table D-3), which is approximately the annual cost of one person (salary and overhead). It seems unreasonable that this cost sufficiently covers the pre-existing stormwater labor cost in 1999 for these entities. The street sweeping costs provided for the city of Clovis were corroborated by the city's 2002/03 CAFR within 1 percent.

Surrounded by largely agricultural land, California's capital city is located in the central valley at the conjunction of the Sacramento and American rivers. The city of Sacramento has a population just exceeding 400,000 (www.census.gov). The stormwater program is coordinated by the Department of Utilities. Descriptive characteristics for the city of Sacramento are shown in Table 7-1. Primary personal communication was with Bill Busath from the city of Sacramento. The city of Sacramento costs for 2002/2003 were for complying with their 2002 stormwater permit (RWQCB, Central Valley, 2002b).

Table 7-1. Select Characteristics of the City of Sacramento

Description	Characteristic	Reference
Mean Income Per Person, $	18,721	www.census.gov
Area, (sq. miles)	99	www.census.gov
Population	407,018	www.census.gov
Curb Miles Swept	26,450	Table E-6
Active Construction Sites	417	Sacramento, 2003b
Industrial and Commercial Sites	N/A	N/A
Households	163,957	www.census.gov
City Actual General Fund Revenue, $	267,464,000	Sacramento, 2003a
Annual Rainfall (cm)	46	www.wrcc.dri.edu
Years Since Incorporation	154	www.cityofsacramento.org
*Reporting these numbers started in fiscal year 2004/05 (Sacramento, 2003b)		

7.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

The staff provided two spreadsheets, which included cost data. One spreadsheet contained direct costs while the other contained labor costs. These spreadsheets represent the entirety of the city's stormwater costs except for the verbal estimates for street sweeping and pump station cleaning activities. The direct and labor cost spreadsheets are presented in Appendix E, Tables E-2 and E-8 respectively. The labor costs as assigned to cost survey categories are presented in Table E-7.

City of Sacramento, Stormwater Management Program, 2002/03 Annual Report

This report provided activity statistics (e.g. curb miles swept) for various city stormwater programs. These statistics were used to normalize costs to allow comparison with other cities.

Personal Communication: Interviews, Phone Calls, E-Mail

Through personal communication, city staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories. Also, verbal cost estimates for street sweeping and pump station cleaning activities were provided.

Comprehensive Annual Financial Report (CAFR) 2002/03

During the 2002/03 fiscal year, the city of Sacramento had a fund in place to account for overall stormwater related transactions. This fund is called the "Storm Drainage" fund (Sacramento, 2003a). The cost figures in this fund were used for comparison purposes with costs submitted by city stormwater staff.

City of Sacramento, Stormwater Quality Improvement Plan (SQIP) July 2003

While no cost figures were obtained from this document, it was used to verify that an activity was required for compliance with the permit.

7.2 COST DATA SUMMARY

Table 7-2 summarizes the stormwater program costs for each cost category. Figure 7-1 shows the relative distribution of costs among the categories. These cost figures include labor costs for the stormwater staff.

Table 7-2. City of Sacramento Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	261,716
Illicit Discharge Detection and Elimination (IDDE)	37,507
Industrial and Commercial Management Programs	42,318
Overall Stormwater Program Management	281,502
Pollution Prevention and Good Housekeeping for Municipal Operations	3,510,806
Post Construction Water Management in New Development and Redevelopment	38,517
Public Education, Outreach, Involvement, and Participation	361,440
Water Quality Monitoring	494,577
Watershed Management	31,591
Total	**5,059,973**

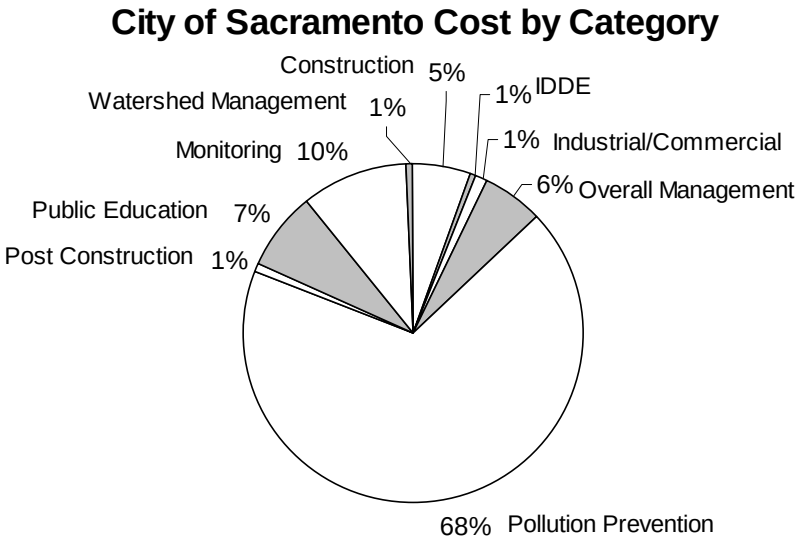


Figure 7-1. Distribution of Sacramento Stormwater Costs Among the Cost Survey Categories

7.2.1 Discussion of Costs for Each Survey Category

Cost breakdown and calculations for each survey category are found in Appendix E, Table E-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program cost was $261,716, which was 5 percent of overall stormwater cost. The construction program oversaw 417 active construction sites (Sacramento, 2003b) and performed 6,375 inspections. The average cost was $29 per inspection and $628 per active construction site.

Illicit Discharge Detection and Elimination

The IDDE program cost was $37,507, which was less than 1 percent of total stormwater cost. This cost is the only item attributed to this program and represents stormwater staff labor.

Industrial and Commercial Management Programs

The industrial and commercial management program cost was $42,318, which was less than 1 percent of total stormwater cost. The only cost attributable to this program was for the development of BMP handbooks and labor to do inspections.

Overall Stormwater Program Management

The overall management program cost was $281,501, which was 6 percent of total stormwater cost. Costs in this program were for office products, annual reporting, planning, mailing, CASQA fees, NPDES fee, and legal fees.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $3,510,806, which was 69 percent of total stormwater cost. The two primary activities for this category were street sweeping and pump station cleaning. The average cost was $50 per curb mile swept. Street sweeping and pump station costs are about 38 percent and 12 percent of total stormwater cost respectively. These percentages are based on the estimates provided by city staff and do not include labor cost allocated to oversee this program. Street sweeping costs were discounted because the city performed additional sweeping in their downtown area that was not permit required. This may be an unfair comparison to other permits that are vaguer about the sweeping requirements. In these programs (see Fresno-Clovis Metropolitan Area as an example), all sweeping costs were included because it was assumed that all sweeping was in compliance with the permit. The discounted amount for Sacramento's street sweeping costs was $277,252.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $38,517, which was less than 1 percent of total stormwater cost. Post construction cost was primarily for stormwater staff labor and student intern labor associated with working with developers to assure deployment of appropriate post construction BMPs. In addition, $2,500 was spent for the development of BMP handbooks.

Public Education, Outreach, Involvement, and Participation

The public education and outreach program cost was $361,440, which was 7 percent of total stormwater cost. The largest cost for this program was labor, which included both stormwater staff and student internship labor. The total labor cost was approximately 45 percent of the total public education and outreach program cost. The cost of development of integrated pest management (IPM) was about 11 percent and television and newspaper advertisements constituted 19 percent and 5 percent, respectively.

Water Quality Monitoring

The monitoring program cost was $494,577, which was 10 percent of total stormwater cost. Modeling and data analysis accounted for $131,688. Sample collection and lab cost accounted for $303,077. Stormwater staff and student labor accounted for $59,812.

Watershed Management

The cost of this category was $31,591, which was less than 1 percent of total stormwater cost. The primary cost attributed to this category was for stormwater staff labor.

7.3 CONFIDENCE IN THE DATA

For the city of Sacramento, confidence in the data was moderate. Several factors were considered in this assessment. The costs for street sweeping and pump station cleaning were estimated and represent approximately 34 percent of total stormwater program cost for the city. Since 34 percent of total stormwater cost was based on estimates, a higher level of confidence in the data could not be allowed. Secondly, the labor and direct cost data was submitted in spreadsheets built, maintained, and updated by the city staff with the labor costs being based on accounting system generated cost figures. The confidence in the data for Sacramento would be noticeably increased if 2003/04 data were considered (Busath, personal communication, 11/23/04). The city of Sacramento had a fund (Storm Drainage) set up to account for overall stormwater expenditures. Total expenditures for the Storm Drainage fund were $30,926,000[6] (City of Sacramento, 2003a), while total stormwater costs submitted by city staff were $5,046,157. This difference is attributed to the expense for flood control and conveyance work not required by the NPDES permit. Differentiation of stormwater costs in the CAFR was not possible.

[6] This figure represents the sum of operating expenses, interest expense, amortization of deferred charges, loss on disposition of fixed assets, and transfers out.

The city of Santa Clarita is a small to medium-sized city with a population of 151,088 (www.census.gov). The city lies approximately 25 miles from the Pacific coastline in the Santa Clara River watershed. The stormwater program is coordinated by the Field Services Department. Descriptive characteristics for the city of Santa Clarita are shown in Table 8-1. Primary personal communication was with Oliver Cramer and Travis Lange from the city of Santa Clarita. The city of Santa Clarita costs for 2002/2003 were for complying with their 2001 stormwater permit (RWQCB, Los Angeles, 2001).

Table 8-1. Select Characteristics of the City of Santa Clarita

Description	Characteristic	Reference
Mean Income Per Person, $	26,841	www.census.gov
Area, (sq. miles)	48	www.census.gov
Population	151,088	www.census.gov
Curb Miles Swept	46,800	Cramer, pers. comm., 4/22/04
Active Construction Sites	64	Santa Clarita, 2003b
Industrial and Commercial Sites	1,071	Santa Clarita, 2003b
Households	52,442	www.census.gov
City Actual General Fund Revenue, $	61,659,874	Santa Clarita, 2003a
Annual Rainfall (cm)[1]	33	www.wrcc.dri.edu
Years Since Incorporation	17	www.santa-clarita.com

1. Dry Canyon Reservoir rain gage was used.

8.1 DATA SOURCES

The following describes the information available from the data sources.

Los Angeles County Municipal Storm Water Permit (Order 01-182) Individual Annual Report Form, Attachment U-4

This report was the primary source of cost data for the city of Santa Clarita. The report contained labor and direct cost information for the city's stormwater program broken down into categories (Appendix F, Table F-1). The labor cost is described as "Administrative Costs" and were assigned to the Overall Stormwater Management category because the city was unable to distribute these costs among the programs. This report also provided activity statistics (e.g. curb miles swept) for various city stormwater programs. These statistics were used to normalize costs to allow comparison with other cities.

Personal Communication: Interviews, Phone Calls, E-Mail

Through personal communication, city staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories.

During the 2002/03 fiscal year, the city of Santa Clarita had a fund in place to account for overall stormwater related transactions. This fund is called the "Stormwater Utility" fund (Santa Clarita, 2003a). The cost figures in this fund were used for comparison purposes with costs submitted by city stormwater staff.

8.2 COST DATA SUMMARY

Table 8-2 summarized the stormwater program costs for each cost category. Figure 8-1 shows the relative distribution of costs among the categories. Since the city staff was unable to distribute stormwater staff labor cost among the programs, it has been captured under Overall Stormwater Program Management.

Table 8-2. City of Santa Clarita Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	74,995
Illicit Discharge Detection and Elimination (IDDE)	114,831
Industrial and Commercial Management Programs	12,600
Overall Stormwater Program Management	515,352
Pollution Prevention and Good Housekeeping for Municipal Operations	859,754
Post Construction Water Management in New Development and Redevelopment	106,925
Public Education, Outreach, Involvement, and Participation	49,130
Water Quality Monitoring	3,300
Watershed Management	332,949
Total	**2,069,836**

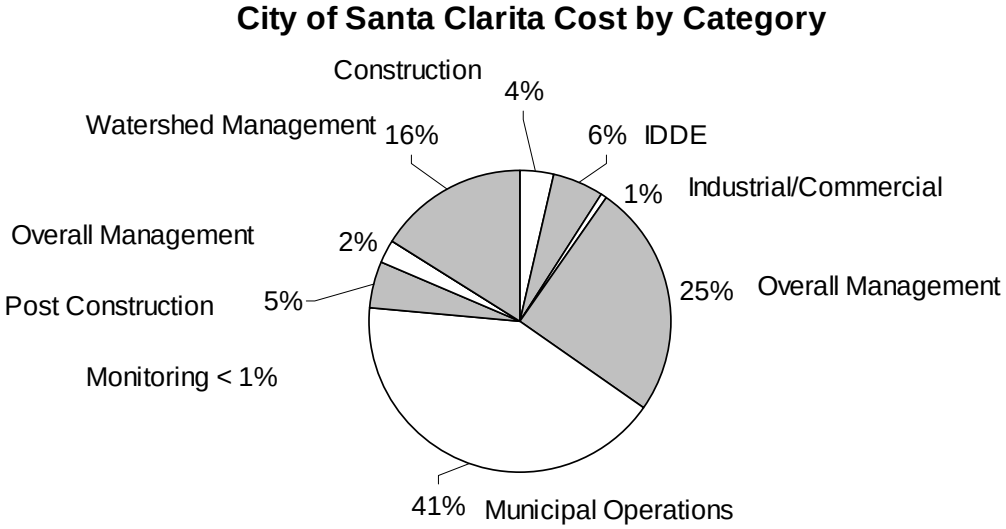


Figure 8-1. Distribution of Santa Clarita Stormwater Costs Among the Cost Survey Categories.

8.2.1 Discussion of Costs for Each Survey Category

Cost breakdown and calculations for each survey category are found in Appendix F, Table F-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program cost was $74,995, which was 4 percent of total stormwater cost. The construction program oversaw 64 active construction sites (City of Santa Clarita, 2003b). The average cost was $1,172 per active construction site. The city performed 11,746 inspections, but this reflects all inspections whether or not stormwater inspections were performed. Therefore, it is not appropriate to normalize against number of inspections or compare the number of inspections with other cities. (City of Santa Clarita, 2003b)

The cost of $74,995 was based on the assumption that all construction site inspections averaged a percentage of time for stormwater inspections. This was applied to the cost of all 11,746 inspections whether or not stormwater issues were addressed in all 11,746, but since an average was applied it was not necessary to eliminate non-stormwater inspections for cost estimation. The cost of $74,995 is the best estimate available for the unknown number of stormwater inspections performed in 2002/03.

The city provided an estimate of what the minimum effort might cost should stormwater inspections be performed exclusively and not more often than what is required in the permit (Cramer, personal communication, 6/24/04). Based on 64 sites, $99.21/hr for an inspector and vehicle, and 2 hrs per site including travel, the minimum cost for all inspections was calculated to be $12,699. This cost is not presented in the report, it is only presented to indicate that some cities that perform stormwater inspections concurrently with other inspections are exceeding the minimum requirements of the permit.

Illicit Discharge Detection and Elimination

The IDDE program cost was $114,831, which was 6 percent of total stormwater cost. The cost for this program was attributable to investigations. The average cost per investigation was $311.

Industrial and Commercial Management Programs

The industrial program cost was $12,600, which was less than 1 percent of total stormwater cost. The industrial program had 110 inspections at an average cost of $115 per inspection.

Overall Stormwater Program Management

The overall management program cost was $515,352, which was 25 percent of total stormwater cost. All of the stormwater staff cost was assigned to this category. The staff costs (including overhead allocation) represent approximately 85 percent of the costs assigned to this category and 21 percent of total stormwater cost. The other cost was $76,520 for development planning.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $859,754, which was 42 percent of total stormwater cost. The two primary activities for this category were street sweeping and catch basin cleaning. The average cost was $12 per curb mile swept and $170 per basin cleaning. Street sweeping cost and catch basin cleaning cost are approximately 27 percent and 12 percent of total stormwater cost respectively.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $106,925, which was 5 percent of total stormwater cost. Post construction cost was primarily for capital costs, which included purchase of vehicles for catch basin cleaning and ICID equipment (Cramer, personal communication, 6/24/04).

Public Education, Outreach, Involvement, and Participation

The public education program cost was $49,130, which was 2 percent of total stormwater cost. Public education and outreach activities often incorporated public involvement and participation activities. This made differentiating cost between the categories impractical. Because of this, the two programs were combined.

Water Quality Monitoring

The monitoring program cost was $3,300, which was less than 1 percent of total stormwater cost. The total cost of monitoring was $3,300, which was for monitoring for diazinon at a single location (Cramer, personal communication, 6/24/04).

Watershed Management

The watershed management program cost was $332,949, which was 16 percent of total stormwater cost. This cost was for the stormwater share of GIS costs.

8.3 CONFIDENCE IN THE DATA

For the city of Santa Clarita, confidence in the data was high. The cost data was found in the annual reporting forms. Through personal communication (Cramer, personal communication, 4/22/04) with city staff, a couple of adjustments to these numbers were made. These figures were later verified by accounting system reports and comparisons to the CAFR.

Since the city of Santa Clarita had a fund (Stormwater Utility) set up to account for overall stormwater expenditures, the level of confidence in the data was increased. This was because a comparison could be made between CAFR cost figures and those submitted by city staff. Total expenditures for the Stormwater Utility fund were $2,869,025, while total stormwater costs submitted by city staff in the annual reporting forms were $2,219,860. Non-stormwater compliance activities totaled $649,205, which exactly accounts for the difference. Because of this match with CAFR expenditures, the level of confidence in the data was increased.

Analysis of the cost survey results and comparisons to costs published independent of this survey are presented in this section. Backup calculations for the analysis presented in this section are in Appendix G. Costs are analyzed by aggregating costs for all cities and by comparing costs between individual cities.

Aggregate cost is the sum of all costs for all cities in this survey. Aggregating costs results in one cost number for total stormwater costs for all programs surveyed. This number is normalized by the number of households for all cities to calculate an average cost per household. Aggregate costs are broken down into each cost category in Section 9.2. Aggregate costs are presented by cost category and by whether they were enhanced, new, or existed prior to the first stormwater permit.

To take into account the size of the city when making comparisons, costs are normalized by number of households. Number of households was used to normalize costs in other studies. Households were selected because it is the most common cost factor from other studies. Quantitative analysis of cost factors that may affect cost per household are presented in Appendix G.

Section 9.4 presents a breakdown of both aggregate costs and individual city costs into the cost classifications of new, existing, and enhanced.

9.1 COST PER HOUSEHOLD

Table 9-1 presents the number of households for the cities surveyed.

Table 9-1. Number of Households for Surveyed Areas

Area	Households
City of Corona	39,271
City of Encinitas	23,843
City of Fremont	69,452
Fresno-Clovis Metropolitan Area[1]	195,311
City of Sacramento	163,957
City of Santa Clarita	52,442

1. The sum of the number of households for city of Clovis, city of Fresno, and the portion of Fresno County served by the FMFCD, which was calculated using the population of Fresno County served by the district, 65,000 (Pomaville, e-mail communication, 9/13/04), and average persons per household for the county (www.census.gov).

Normalized costs are presented in Table 9-2. Annual total cost per household ranged from $18 to $46 for the six cities. The small data set limits the statistical conclusions which may be drawn. Some anecdotal observations are presented below. These costs, ordered by the size of the city, are displayed in Figure 9-1.

The "true" mean in Table 9-2 is based on the sample of all households in the surveyed municipalities. It is calculated by dividing the total stormwater costs of all cities by the number of households of all cities in this survey. This gives a true average cost per household, while averaging the six cost per household values assigns equal weight to each city regardless of how many households are in each city.

Table 9-2. Summary of Normalized Stormwater Costs for Municipalities

Municipalities	Municipality Description	Cost/Household ($)
City of Encinitas	Coastal tourism, small city	46
City of Fremont	Bay Area, moderately integrated countywide program	45
City of Santa Clarita	Tourism and industrial	39
City of Corona	Industrial	32
City of Sacramento	Pumped stormwater, large city	29
Fresno-Clovis Metropolitan Area	65-90% infiltration, fully integrated multi-city program	18
Summary Statistics		
Mean of the six values for each city		35
Median of the six values for each city		36
Standard Deviation of the six values for each city		11
True Mean[1]		29

1. The "true" mean is the aggregate stormwater cost for all cities surveyed divided by the aggregate number of households

9.1.1 Going Beyond Minimum Requirements

In some cases, programs in the California survey appeared to go beyond the minimum requirements of the permit. The cost of this additional effort was not included when it could be identified or estimated, such as street sweeping in Sacramento that was above the permit required frequency. Including the total cost of the street sweeping program the cost per household for Sacramento would increase $1.69. In some cases the additional effort could not be estimated. This was particularly true when stormwater activities were combined with activities that occurred more frequently than the permit requirement for the stormwater activities, such as when stormwater construction inspections for Santa Clarita were performed at every construction permit inspection and these permit inspections occurred more frequently than the permit requirement.

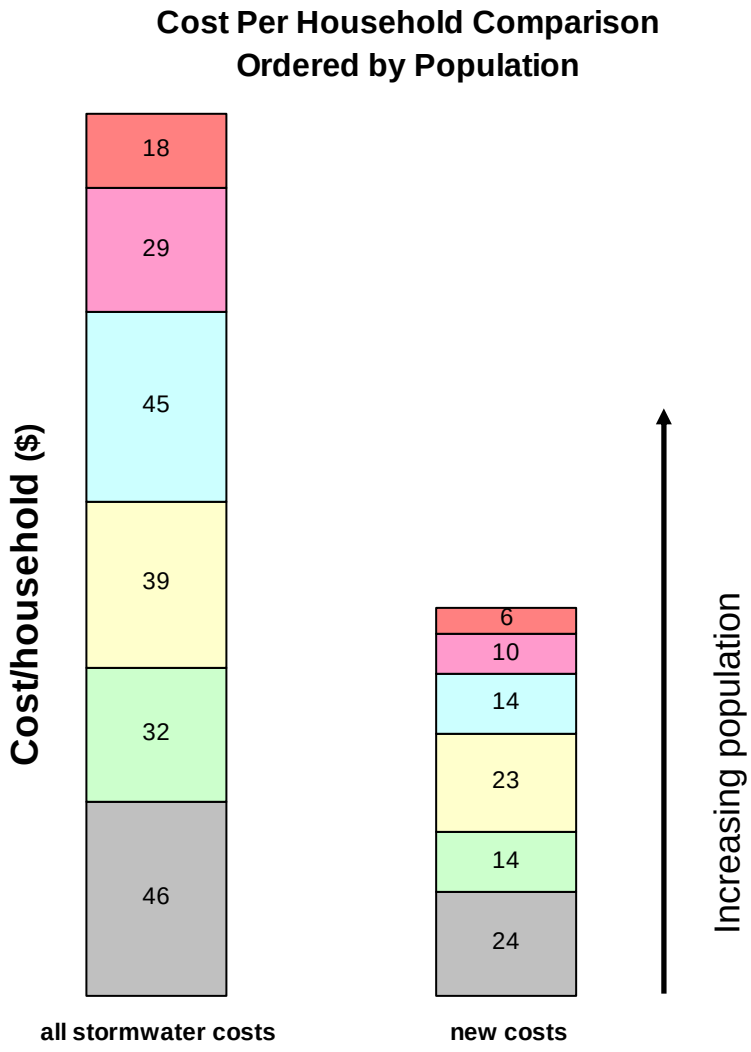


Figure 9-1. Cost per Household Comparison of Each Surveyed City.

9.1.2 Qualitative Discussion of Costs per Households

Qualitative discussion is provided here because quantitatively explaining the variation of costs per households was not successful (see Appendix G for quantitative analyses).

The FCMA had the lowest cost per household. The actual range of costs may be a smaller than what is reported in Table 9-2 because FCMA is at the bottom of this range and FCMA may not have accounted for all cost as well as other survey participants. Recall that the costs for the cities of Fresno and Clovis were based on budgeted numbers. Though the FCMA cost data collected is within the quality expectations of the study team, accounting of actual expenditures may have increased the cost for the FCMA, and decreased the range of costs found in this

survey. However, even if such increases were found, FCMA costs per household would remain substantially lower than the other cities. The following factors are thought to contribute to the FCMA costs limit costs being lower than the other survey results:

- flood control and stormwater quality basins are combined,
- land was set aside for water projects,
- climate helps infiltration due to infrequent storms and low annual rainfall,
- lower land cost compared to other cities,
- FMFCD owned land needed for basins prior to storm water permits requirements,
- topography lends to drainage of urban areas to post-construction BMPs, and
- highly permeable soils allow extensive use of infiltration.

These factors are unique or more prevalent for FCMA than for the other cities surveyed. Excluding the FCMA as an ideal situation, the range of cost is tighter, $29 to $46 per household.

As see in Table 9-2, variation in cost from the other cities is not obviously explainable by the factors of size, location, tourism, and integrated co-permittee programs. These factors are discussed in the following:

Size: Size does not seem to be important as the large cities of Fremont and Sacramento occupy opposite sides of the cost range. Further, Encinitas, population 58,014, and Fremont, population 203,413, had almost identical cost per household. The affect of size on cost per household is shown in Figure 9-1.

Location: Northern versus southern parts of the state do not seem important; however, though it may be coincidental with such a small sample size, the highest cost per household, Encinitas, was adjacent to coastal waters and the next highest, Fremont, is adjacent to South San Francisco Bay.

Tourism: A high dependence on tourism may increase visibility of stormwater problems, such as beach closures and litter. This may not be a very important cost factor because Fremont and Encinitas have very similar cost per household, and yet Encinitas seems to have a far greater reliance on tourism.

Integrated programs: An integrated program is one in which an overseeing agency establishes a common approach in implementing stormwater activities. Certainly in the case of FCMA, an integrated program seems to be an important factor. No other city surveyed had a program in which a single agency implemented a comprehensive plan for post-construction stormwater control for all permittees as did FMFCD for the FCMA. This integration may contribute to relatively low cost per household; however, on the other extreme of the cost range was Fremont, who participates in the Alameda County Clean Water Program.

Not all qualitative factors could be discussed here. Cyre (1983) reports on other qualitative factors that often affect how much a city spends on stormwater activities. Besides the factors discussed above, perceived equity, public acceptance (i.e. willingness-to-pay), and jurisdictional considerations are expected to have an influence on costs.

9.2 AGGREGATE COST BREAKDOWN BY COST CATEGORIES

The distribution of total stormwater costs among the cost categories is shown in Figure 9-2. Note that pollution prevention costs are subdivided into the percent of cost attributed to street sweeping and the percent for all other pollution prevention activities.

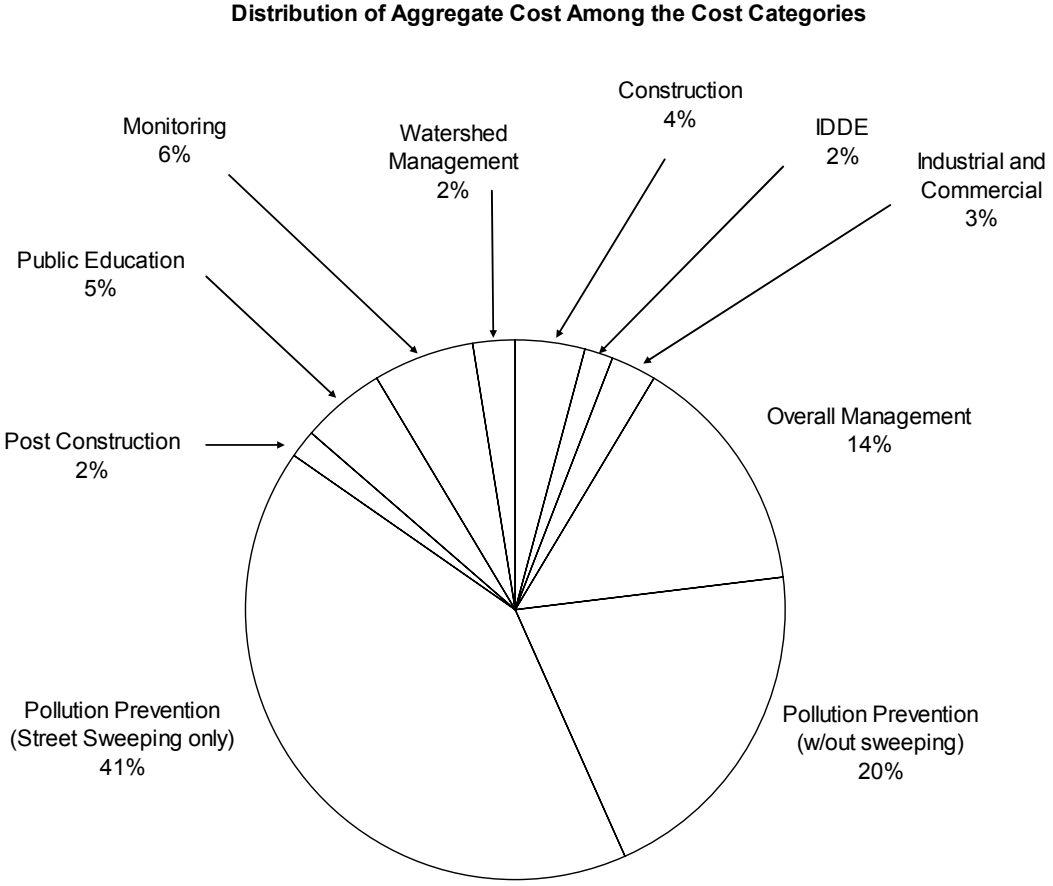


Figure 9-2. Distribution of Aggregate Costs among Cost Categories

9.3 NEW, EXISTING, AND ENHANCED COSTS

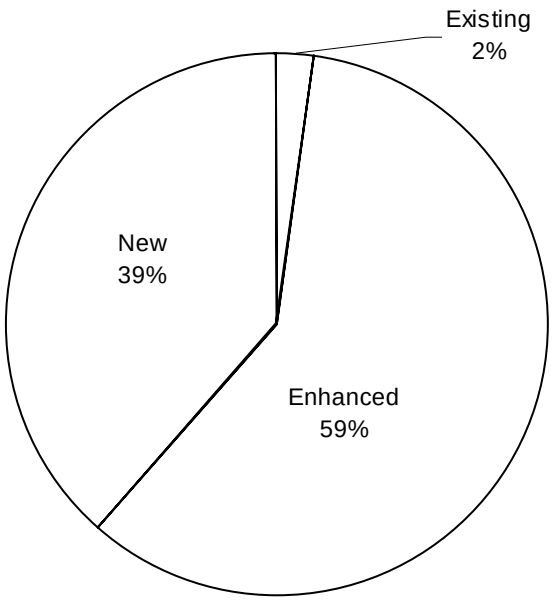
Costs for all stormwater activities were identified as new, existing, or enhanced according to the extent that the activity existed before the first stormwater permit. New costs are for activities that are exclusively a result of compliance efforts with the stormwater permit.

Understanding Enhanced Costs

Some stormwater activities preexisted stormwater permits, but permit requirements caused an increase in effort. Enhanced costs include all costs of these impacted activities, and not just the additional amount due to the increase in activities.

Existing costs are for activities that predated stormwater permits. Enhanced costs are for existing activities that were increased due to permit requirements. Street sweeping is a common example of an enhanced activity. Enhanced costs really consist of an unknown fraction of existing and new costs. In the street sweeping case, it seems that the majority, if not all street sweeping costs for some cities, preexisted stormwater permits. Other cases may be similar. Enhanced costs include street sweeping, drain and channel cleaning, and pump station cleaning. Enhanced costs are the total costs for the impacted activities, and not just the increase in cost. Table 9-3 shows the percentage of stormwater costs attributed to new, existing, and enhanced for each city. The distribution of aggregate cost among these classifications is shown in Figure 9-3.

Distribution of Aggregate Cost Between New, Enhanced, and Existing Costs



New, Enhanced, and Existing are determined by whether the cost existed prior to the first stormwater permit. Enhanced cost existed, but permit requirements caused an increase in cost. Enhanced costs are the total cost for the impacted activities, and not just the increase in cost.

Figure 9-3. Breakdown of Aggregate Costs into New, Existing, and Enhanced Costs

It was proposed in meetings of the TAG that cities with utility fees for stormwater may be less likely to have a high percentage of enhanced costs. This was not observed in the cities surveyed. In fact, cities with a stormwater fee happen to have a larger percentage of 'enhanced' costs, but the observation is not conclusive due to limited sample size. This observation is shown in Table 9-3.

Table 9-3. New, Existing, and Enhanced Cost for Each City

Municipality or Area	Existing	% Ex.	Enhanced	% En.	New	% New	Total	Utility Fee
City of Corona	37,651	3%	651,850	52%	561,365	45%	1,250,866	no
City of Encinitas	16,250	1%	490,786	45%	580,002	53%	1,087,038	no
City of Fremont	200,000	6%	1,915,836	62%	985,605	32%	3,101,442	yes
Fresno-Clovis Area	57,539	2%	2,211,196	63%	1,206,295	35%	3,475,029	yes
City of Sacramento	0	0%	3,257,674	68%	1,562,299	32%	4,819,973	yes
City of Santa Clarita	50,403	2%	809,351	39%	1,210,082	59%	2,069,836	yes
Total	**361,842**		**9,336,694**		**6,105,648**		**15,804,184**	

All the enhanced cost activities are under the Pollution Prevention cost category. Of the 59 percent of aggregate cost attributable to enhanced costs, 70 percent was for street sweeping. Figure 9-4 shows the distribution of enhanced cost among the pollution prevention activities.

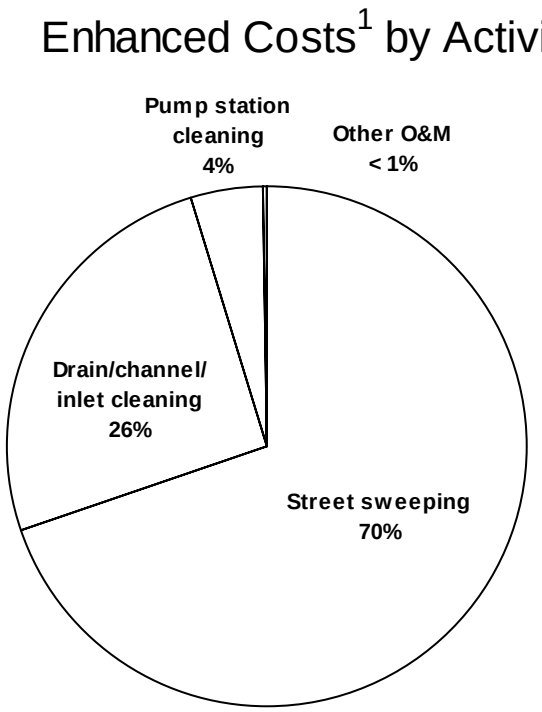


Figure 9-4. Breakdown of Enhanced Costs by Stormwater Activity

Existing costs, while only two percent of all cost, are mostly pollution prevention costs as seen in Figure 9-5. A single activity for one city, litter and debris removal for the city of Encinitas, accounts for 66 percent of the existing pollution prevention cost for all cities.

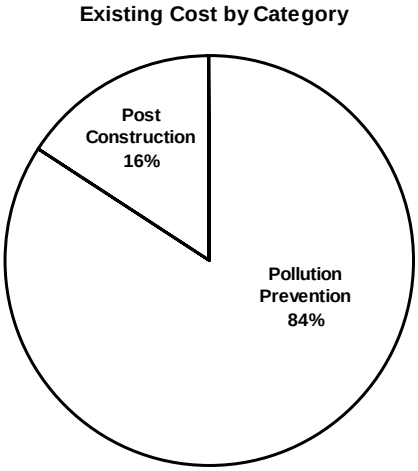


Figure 9-5. Breakdown of Existing Costs by Cost Category

New costs include cost from all categories. One hundred percent of all categories under "new" were identified as new cost, except for post construction and pollution prevention. Figure 9-6 shows the distribution of new costs among the cost categories.

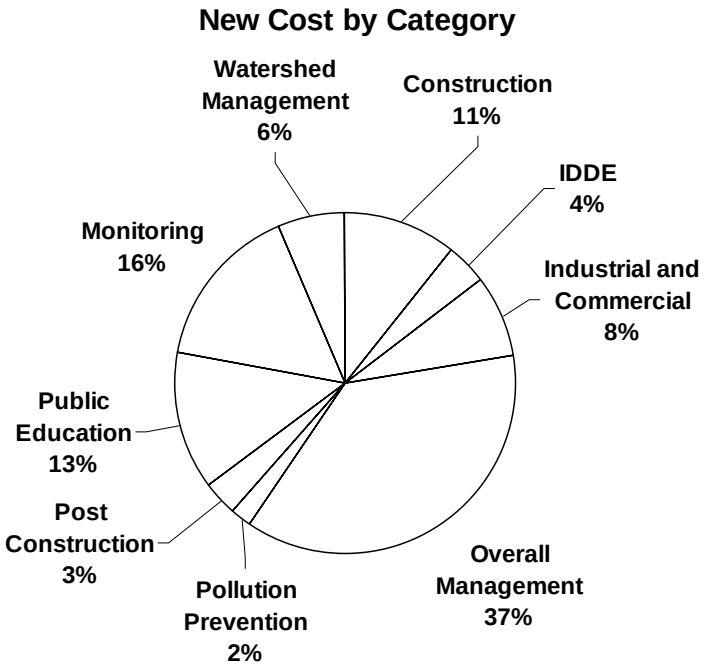


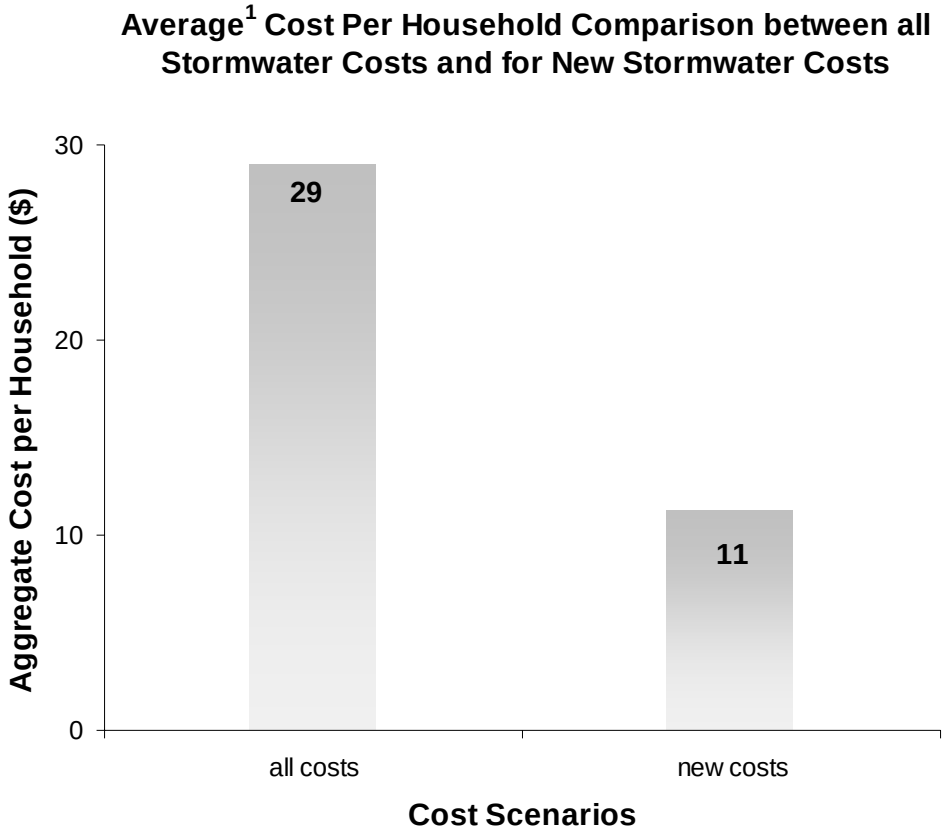
Figure 9-6. Breakdown of New Costs by Cost Category

The distribution, among new, existing, and enhanced, of aggregate cost for all cost categories is shown in Table 9-4. Figure 9-7 shows average cost per household for all stormwater costs and for only new stormwater costs.

Table 9-4. Distribution of Aggregate Cost Category between New, Existing, and Enhanced Classifications[1]

	% New	% Existing	% Enhanced[2]
Construction	100%	0%	0%
IDDE	100%	0%	0%
Industrial and Commercial	100%	0%	0%
Overall Management	100%	0%	0%
Pollution Prevention	1%	3%	96%
Post Construction	78%	22%	0%
Public Education	100%	0%	0%
Monitoring	100%	0%	0%
Watershed Management	100%	0%	0%

1. New, Enhanced, and Existing are determined by whether the cost existed prior to the first stormwater permit. Enhanced cost existed, but permit requirements caused an increase in cost.
2. Enhanced costs are the total cost for the impacted activities, and not just the increase in cost and as such, enhanced costs are made of unknown distribution between new and existing costs.



1. Average cost per household is the aggregate cost divided by the aggregate number of households.

Figure 9-7. Comparison of Aggregate Cost per Household for All Costs and for New Costs

9.4 DISCUSSION OF STORMWATER COSTS FOR SELECTED COST CATEGORIES

Noteworthy observations of costs for select categories are presented in this section. Only a qualitative discussion is warranted due to insufficient data.

Overall Stormwater Management: This category included legal fees. Appellant fees are excluded, but legal advice on program implementation and response to citizen suits are included. It is assumed that if legal fees are incurred, it is a cost of running a stormwater program. Legal costs were always less than 18 percent of the total cost of this category.

Pollution Prevention: Street sweeping accounts for 68 percent of the cost of this category as seen in Figure 9-8. The unit cost of street sweeping was a commonly asked question during TAG reviews. A summary of street sweeping statistics is presented in Table 9-5. No explanation was identified for the variation in street sweeping costs, though it does not exceed the estimated cost

from the Rouge River study (see Section 9-6 for comparisons). One suggestion not observed in the data is that frequency has an effect on unit cost because more frequent sweeping increase cost efficiency. Table 9-5 shows unit cost of street sweeping and approximate frequency sorted by unit cost. Clearly, differences in street sweeping practices, such as sweeper speed, will affect costs.

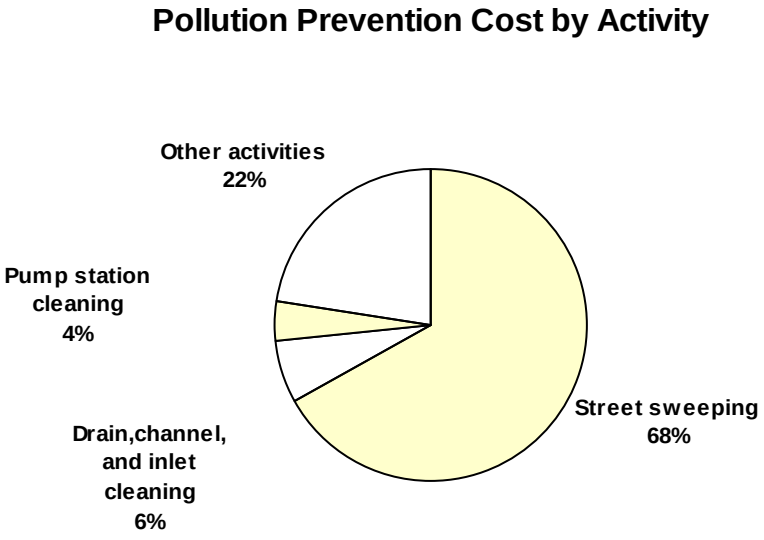


Figure 9-8. Breakdown of Pollution Prevention Costs by Activity.

Table 9-5. Street Sweeping Statistics for Municipalities

Municipality	Street Sweeping Costs ($)	Annual Curb Miles Swept	Cost Per Curb Mile Swept ($/curb mile)	Estimated Annual Frequency[2]
Fremont	1,915,000	31,405	61	12
Sacramento	1,322,748	26,450	50	12
Encinitas	117,962	5,832	20	12
Corona	414,215	20,877	20	26
Fresno-Clovis Area[1]	2,193,296	142,411	15	12
Santa Clarita	557,443	46,800	12	50

1. A breakdown of costs and number of miles swept for the cities of Fresno and Clovis can be found in Appendix Table D-5. Frequency for the city of Fresno was found at http://www.fresno.gov/public_utilities/sanitation/cleanup_street_clean.asp.
2. When an average frequency was not available, frequency was taken as the frequency for residential areas.

Post Construction: Post Construction costs are expected to increase dramatically as cities move into full implementation of SUSMP type requirements for new development and redevelopment.

The reported costs are particularly misleading for cost projection purposes since the research coincides with the start of SUSMP type requirements implementation.

9.5 LIMITATIONS

The information presented is anecdotal. It should not be used to establish a measure of compliance because of the lack of quantitative explanations for the observed variability in cost per household.

9.6 COMPARISONS TO OTHER STUDIES AND SURVEYS

The normalized costs from this cost survey were compared to outside literature (e.g. studies, professional papers, conference proceedings, etc.). Other cost sources include, the NAFSMA survey of Phase II costs, the USEPA review of cost submitted in Phase I permits, the Rouge River National Wet Weather Demonstration Project, street sweeping costs for the city of San Antonio, and projected cost (based on actual expenditures) for the city of Los Angeles. It is important to recognize that the study team did not establish the quality of this other data. However, in some cases literature data could be excluded based on the available information. For example, flow conveyance costs were not included in the California survey; but in some cases they were reported as stormwater costs in other studies, such as the Black and Veach "stormwater utility" survey (2002). This could be because stormwater cost estimates are used to develop a single fee that is used to fund both conveyance and NPDES permit compliance activities.

9.6.1 Current Los Angeles Cost Estimate

Staff of the Los Angeles Regional Water Quality Control Board estimated the cost to comply with the Los Angeles County municipal storm water permit. Using the estimation method believed to be most reliable, Radulescu and Swamikannu (2003) estimated cost per household to be $18. It does not appear that stormwater conveyance costs were included in these costs.

9.6.2 National Association of Flood and Stormwater Management Agencies (NAFSMA) Survey

The USEPA report "Economic Analysis of the Final Phase II Stormwater Rule" contains a summary of costs from two separate efforts to estimate Phase II cost per household. The first is the results of a survey stormwater costs for 56 Phase II municipalities performed by NAFSMA. The NAFSMA survey of five cost measures represents the six minimum measures of the Phase II regulations because two measures seemed to have been combined: 1) Public Education and Outreach and 2) Public Involvement and Participation.

The second effort presented in the USEPA report is that of a review, performed by USEPA, of 26 Phase I municipalities. These 26 municipalities were chosen they were relatively small Phase

I cities, they were nearly in the first permit term, and they had cost published in their annual reports.

The California survey results for the same five minimum measures were extracted to compare to the NAFSMA survey and the EPA review in Table 9-6. The costs were adjusted to 2003 dollars using the Consumer Price Index Urban (U.S. Bureau of Labor Statistics, 2005).

Table 9-6. Stormwater Costs per Household for Six[1] Minimum Measures from the California Survey, the NAFSMA[2] Phase II Survey, and the USEPA review of Phase I Annual Reports (USEPA, 1999)

Study	Median (50%) ($)	Mean ($)	Max ($)
Adjusted California Survey[3]	24	26	35
NAFSMA Phase II Survey[4]	4.63	10	61
EPA Phase I Survey[5]	3.16	10	67

1. Public Education and Outreach and Public Involvement and Participation were assumed combined for the NAFSMA survey.
2. NAFSMA: National Association of Flood and Stormwater Management Agencies
3. Based only on costs from cost categories that correspond to the six minimum measures
4. NAFSMA survey based on 56 Phase II respondents to a survey on stormwater costs for five minimum measures. Values adjusted to 2003 dollars.
5. EPA results based on a review of 26 annual reports for smaller Phase I cities that were nearly in their first NPDES term so that costs would be more representative of Phase II programs. Values adjusted to 2003 dollars.

9.6.3 Rouge River National Wet Weather Demonstration Project (Furguson, 1997)[7]

This study collected cost information for stormwater runoff controls. Total stormwater costs for municipalities in the Rouge River project were not reported. Costs were available for municipal operations and for public education. These costs are not presented here because further information is needed to indicate how the California cities compare to the Rouge River programs. First, municipal operations often include flood conveyance costs and without further information, cost comparisons are not appropriate. Second, without knowing the total stormwater cost of these cities, comparison to individual programs are not presented because cities may focus on different stormwater programs (different cost categories) based on local concerns. This may be especially true of public education costs.

Costs were also available for street sweeping. The Plymouth Township street sweeping costs were reported at $78/curb mile. This number can be compared to the range of cost per curb mile in the California survey, which was $12 to $61 per curb mile. Also, the reported cost range for contracted street sweeping costs for the Rouge River project was from $149 to $172 per curb mile. It was not investigated why contracted street sweeping is so much higher.

[7] All Rouge River costs were presented in 1997 dollars and these were converted to 2003 dollars.

9.6.4 San Antonio Street Sweeping Costs

The city of San Antonio is reported to spend $3.5 million on street sweeping (Brazozowski, 2004). The city of San Antonio estimates that around 45,000 curb miles were swept (Martinez, 2004). This results in a cost per mile swept of $78. The highest cost per mile from the California survey was $61, indicating costs per mile from the survey are reasonable despite a wide range.

This section discusses the significance of cost survey results and suggests standards for reporting cost and activities performed. These suggestions are meant to build the dataset necessary to make management decisions on stormwater program implementation.

10.1 SIGNIFICANCE OF SURVEYED STORMWATER COSTS IN CALIFORNIA

The range of 2002/03 fiscal year stormwater costs for the six municipal areas[8] surveyed was $18 to $46 per household. This only provides a snap shot of costs in 2002/2003 of good California Stormwater programs. Costs will change as requirements change with each new permit.

A specific example of increasing permit requirements is TMDL compliance. TMDL costs are sometimes addressed within the implementation plans or the cost to achieve water quality objectives may already be addressed in 305 (b) reports[9]. Since TMDL requirements will be added to stormwater permits, these cost estimates are an indication of how permit compliance costs will be increasing. However, TMDL allocations may be distributed to a variety of sources besides stormwater, thus stormwater treatment will not bear the entire burden of restoring beneficial use to impaired waters.

Another factor affecting cost in the near term is the increased level of attention given to Standard Urban Stormwater Mitigation Plans (SUSMPs). Post-construction costs in particular are expected to increase significantly, but that cost may be borne by developers and contractors rather than municipalities.

Although compliance with construction and industrial permits is discussed in stormwater permits, the costs for municipalities to comply with these permits are not addressed in this report.

10.2 SUGGESTIONS FOR REPORTING COSTS AND ACCOMPLISHMENTS

Current variability in the organization and content of the data submitted by the cities indicates standards for reporting costs and stormwater activities are needed to allow accurate cost comparisons to be made between stormwater activities. This cost information is crucial in making management decisions regarding which stormwater activities should be implemented.

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[8] The Fresno-Clovis Metropolitan Area includes the stormwater costs of the cities of Fresno and Clovis.

[9]Even if TMDL plans do not address cost, Section 305 (b) states "each State shall prepare and submit….a report which shall include…an estimate of the environmental impact, the economic and social costs necessary to achieve the objective of this chapter in such State, including an estimate of the costs of implementing such programs". First, assuming all 303 (d) listed waters are a subset of 305 (b) waters, it could be assumed that the CWA requires a cost analysis for TMDL implementation plans (which is interpreted as "each State shall prepare…". Otherwise it seems to be required in the State's "305(b) report". Either way, analysis of the cost to restore water quality may be an ongoing requirement.

The following recommendations for cost reporting are only the first step in the process of developing consistent cost reporting. This process includes notifying cities of reporting goals, receiving feedback and data from the cities, reviewing reported costs for quality and consistency, and providing feedback to the cities.

10.2.1 Current Variability

In this survey, there seemed be inconsistent reporting and tracking of stormwater activities and associated costs. This could be from differences in the reporting requirements for each permit. The reasons for these differences were not investigated; however, some possibilities are discussed. One reason may be that interest in cost may vary between RWQCB jurisdictions. Also, cost tracking systems used by the cities may not be designed to accurately track stormwater costs by activity. According to a survey conducted in 2001-2002, only 50 percent of 122 surveyed stormwater utilities said that their accounting system permitted cost tracking by operating activity (e.g. inlet cleaning) (Black and Veatch, 2002). Also, Radulescu and Swamikannu (2003) note that current governmental accounting standards do not require a distinction of stormwater costs. This was confirmed by a review of these standards by the study team.

10.2.2 Proposed Data Tracking and Reporting

A separate fund to account for stormwater related expenditures would provide cities with a starting point for stormwater cost collection. Cities would be able to use this fund for stormwater related expenditures needed for annual stormwater report preparation. It is important that the fund distinguish between stormwater permit compliance costs and stormwater conveyance costs. Having a fund in place also means that the costs reported in the fund would be subject to independent audit on a yearly basis, which would increase the level of confidence in reported cost figures. Stormwater costs should be further broken down into stormwater programs.

Caution for Template Reporting Requirements

Some of the templates used in annual reports reviewed during the survey had yes/no questions for stormwater activities that discouraged quantification of accomplishments.

For all programs, there are several costs that should be tracked for each cost category discussed below. The cost for labor of stormwater staff and benefits should be tracked for each program or allocated to each program on a reasonable basis. Direct costs (e.g. phone, field and office supplies, etc.) and depreciation costs (e.g. vehicles and equipment) should also be tracked for each program. Finally, overhead allocation for the entire stormwater program should be distributed to each cost category. Overhead allocation is often estimated by the cities as a straight percentage of labor cost and includes building fees, payroll, human resources, legal, administration, and other costs that provide ancillary support for stormwater activities.

As with costs, accomplishments should be tracked to support stormwater management decisions. The ultimate goal is to be able to compare cost benefit between stormwater programs and

activities[10]. Reporting accomplishments in terms of receiving water quality benefit is ideal, but currently unrealistic.

Suggested cost categories and what activities they cover are discussed in the following sections.

Construction Site Stormwater Runoff Control

Stormwater permits require cities to implement construction programs that minimize the negative impacts of construction on MS4 stormwater quality. This is commonly accomplished by establishing city ordinances that give the city the legal authority to implement to program. This is a parallel and separate effort from the statewide construction permit issued by the SWRCB. The construction program assists contractors and developers in following appropriate USEPA guidelines for construction sites. Cities accomplish this by instituting ordinances, inspecting sites and providing training to contractors and city inspectors. The USEPA activities that apply to construction sites are divided into four different categories: runoff control, sediment control, erosion control, and good housekeeping. Runoff control activities include minimizing clearing, stabilizing drainage ways, and installing check dams, berms, grass-lined channels, and riprap. The sediment control category includes installing perimeter controls, installing sediment trapping devices, installing drain inlet protection. Erosion control activities include stabilizing exposed soils, permanent seeding, installing sod, soil roughening, protecting steep slopes, geotextiles, gradient terraces, soil retention, temporary slope drain, protecting waterways, temporary stream crossings, vegetated buffers, phase construction, construction sequencing, and dust control (USEPA, 2004).

Cost of stormwater inspections at construction sites, the number of inspections performed, and the number of active construction sites should be tracked. Only inspections should be tracked when stormwater issues are being addressed by a part of the inspection. It is suspected that some building inspectors still count inspections toward stormwater for latter phases of projects, such as interior building work, that has little impact on stormwater. This should be avoided.

Cost of training provided to inspectors and contractors should be tracked, including the cost for the participating inspectors to attend the training. The number of person-hours trained should be tracked for stormwater staff inspectors because the city must pay for each city staff member attending training. For contractor training, the number of training hours provided (regardless of group size) should be reported because the cities do not pay for the contractors to attend as they do for city staff.

Illicit Discharge Detection and Elimination

The IDDE program seeks to identify and eliminate illicit discharges to the storm sewer system. This is done by inspecting connections to the storm sewer system and requiring landowners to remediate illegal discharges. Common IDDE problems include failing septic systems,

[10] A subcommittee of the California Stormwater Quality Association (CASQA) is working on developing guidelines for program effectiveness evaluation.

industrial/business connections, recreational sewage, and sanitary sewer overflows. Costs relating to the activities of identifying illicit connections, wastewater connections to the storm drain system, and illegal dumping should be reported in this category (USEPA, 2004).

For the IDDE program, the cost of inspections for illicit connections and discharges to the stormwater drainage system and the number of inspections should be tracked. Like construction, it is difficult to account for stormwater costs because many activities performed by inspectors serve other purposes, such as inspection of the sanitary sewer system.

Cost of training provided to inspectors should be tracked, including the cost for the participating inspectors to attend the training. The number of person-hours trained should be tracked for stormwater staff inspectors in order to effectively allocate overhead cost.

Industrial and Commercial Management Programs

Similar to the construction program, the industrial and commercial program uses the development and enforcement of city ordinances to minimize pollution of MS4 stormwater. Examples of practices employed by facilities include good housekeeping such as covered material storage, emergency spill equipment, facility sweeping, no "hosing off" into storm drains, and secondary containment of industrial materials.

For the industrial and commercial program, the cost of inspections should be tracked as well as the number of industrial and commercial facilities. Also, the cost of training provided to inspectors should be tracked, including the cost for the participating inspectors to attend the training. The number of person-hours trained should be tracked for stormwater staff inspectors.

Overall Stormwater Program Management

The costs in this category are for stormwater staff costs that could not be allocated to the other cost categories. It includes costs associated with development and oversight of the entire stormwater program. Also, costs for management plans, NPDES fees, reporting, mail, legal support, travel, conferences, printing, producing manuals and handbooks, and other non-labor costs are included that could not be allocated. Normalization for this category is not practical because of the wide variety of activities, and because very few of these activities can be numerically quantified.

Pollution Prevention and Good Housekeeping for Municipal Operations

This program includes costs for source control activities relating to pet waste collection, automobile maintenance, vehicle washing, illegal dumping control, landscaping and lawn care, pest control, parking lot and street cleaning, roadway and bridge maintenance, septic system controls, storm drain system cleaning, and alternative discharge options for chlorinated water. Costs for materials management would be for alternative products, hazardous materials storage, road salt application and storage, spill response and prevention, used oil recycling, and materials management (USEPA, 2004).

For this program, the cost for street sweeping and the number of curb miles swept should be tracked. Also, the cost for drain line and channel cleaning, pump station cleaning, and similar activities along with their associated activity statistics (e.g. lbs. of debris removed) should be tracked.

Post Construction Stormwater Management in New Development and Redevelopment

This program assures that private developers implement post-construction BMPs (treatment BMPs[11] and permanent source control BMPs). This program also includes maintenance of post-construction BMPs on city-owned property. This cost is included, because unlike the construction and industrial programs, post-construction requirements are not regulated by a separate permit.

Treatment BMPs include ponds, dry extended detention ponds, wet ponds, infiltrations practices, basins, trenches, porous pavement, filtration practices, bio-retention, sand and organic filters, vegetative practices, stormwater wetland, grassed swales and filter strips, runoff pretreatment practices, catch basins and inserts, in-line storage, and manufactured products for stormwater inlets. Source control[12] or source reduction BMPs include the following activities: experimental practices, alum injection, on-lot treatment, better site design, buffer zones, open space design, urban forestry, conservation easements, infrastructure planning, narrower residential streets, eliminating curbs and gutters, green parking, alternative turnarounds and pavers, BMP inspection and maintenance, ordinances for post construction runoff, and zoning (USEPA, 2004). If the city performs these activities in-house, the costs should be included in this category.

Public Education, Outreach, Involvement, and Participation

Education and outreach to homeowners would cover topics such as lawn and garden care, water conservation practices, pet waste, trash management, and proper disposal of hazardous waste. General outreach would include outreach relating to commercial activities, tailoring outreach programs to minority and disadvantaged communities and children, classroom education, and educational materials. Outreach relating to new development and existing development would include low impact development, educational displays, pamphlets, booklets, and utility stuffers, media, promotional giveaways, and pollution prevention for businesses. Relating to public involvement and participation, activities would include storm drain marking, stream cleanup and monitoring, volunteer monitoring, reforestation programs, wetland plantings, adopt-a-stream programs, watershed organization, stakeholder meetings, attitude surveys, and community hotlines (USEPA, 2004).

[11] Treatment BMPs have been called structural BMPs, but the term 'treatment BMP' is preferred since source control BMPs often have structural components.

[12] The USEPA defines these as "nonstructural", but some source controls such as berms and material covers and many erosion controls are structural so the term source control or source reduction is used in this report.

It is unclear at this time of the utility of tracking specific costs of this program and how they may be related to water quality improvements.

Water Quality Monitoring

The program tracks costs related to monitoring or both stormwater and receiving water quality. These costs cover preparation of monitoring plans, sample collection, sampling equipment, laboratory analysis, data analysis, and reporting.

Watershed Management

This program can be used to track cost for watershed meetings, meeting with stakeholders, and development of watershed management plans. It may also be an appropriate category for coordination costs for TMDL planning.

Conclusion on Category Recommendations

It may prove that costs cannot be reported as suggested. Flexibility in compliance is an important aspect to cost effectiveness, however, too much flexibility in reporting requirements generates a useless dataset. At a minimum, it is suggested that annual reports throughout the state follow a standard format for cost reporting, whether the one suggested here is followed or not.

10.3 TAG RECOMMENDATIONS FOR COST TRACKING

The TAG proposes that if the permittees have a correct cost accounting/reporting system, they would be granted an additional quantity of points towards their receipt of a grant under a state/federal program; for example, Section 319(h) grants are evaluated on a point ranking system that is established by a state. If the cost accounting/reporting information were tabulated pursuant to the state's suggested format, that applicant would receive a bonus allotment equal to a boost in total points of approximately 15 percent. This would alert permittees to the benefit in competing for these grants as a prerequisite to establishing the appropriate cost accounting system. The proposed system would benefit from review and acceptance by the California League of Cities.

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ACCWP: Alameda Countywide Clean Water Program

BMP: best management practice[13]

CAFR: Comprehensive Annual Financial Report

CASQA: California Stormwater Quality Association

CFR: Code of Federal Regulations

CPR: Coalition for Practical Regulation

CSUF: California State University, Fresno

CSUS: California State University, Sacramento

CWA: Clean Water Act

DAMP: Drainage Area Master Plan

FCMA: Fresno-Clovis Metropolitan Area

FMFCD: Fresno Metropolitan Flood Control District

GIS: Geographic Information System

IDDE: Illicit Discharge Detection and Elimination

IPM: integrated pest management

JURMP: Jurisdictional Urban Runoff Management Program

LAFCD: Los Angeles Flood Control District

LARWQCB: Los Angeles Regional Water Quality Control Board

MEP: maximum extent practicable

MS4: Municipal Separate Storm Sewer System

NAFSMA: National Association of Flood and Stormwater Management Agencies

NPDES: National Pollutant Discharge Elimination System

[13] BMP, as used in this report, refers to conventional BMPs that operate without power or operators. It does not include advanced treatment.

OWP: Office of Water Programs

RWQCB: Regional Water Quality Control Board

SAR-DAMP: Santa Ana Regional Drainage Area Management Plan

SQIP: Stormwater Quality Improvement Plan

SUSMP: Standard Urban Storm Water Mitigation Plan

SWMP: Storm Water Management Plan

SWPPP: Storm Water Pollution Prevention Plan

SWRCB: State Water Resource Control Board

TAG: technical advisory group

TMDL: total maximum daily load

UCLA: University of California, Los Angeles

USC: University of Southern California

USD: Union Sanitation District

USEPA: United States Environmental Protection Agency

WERF: Water Environment Research Foundation

The backup calculations for the cost for each cost survey category in Section 3 and the sources of the cost data are presented in this appendix. Tables generally are presented by sequentially increasing levels of detail. Figure A-1 illustrates how data is shared throughout the tables.

Table A-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 3, Table 3-2. The remaining tables (A-2 through A-12) present the detailed back-up information for the numbers in Table A-1. Table A-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table A-2. Item numbers corresponding to the subtotals in Table A-2 were added to the left hand column to easily show how the numbers are pulled forward to Table A-1. The right hand column in Table A-2 was added to show how costs were allocated to the cost survey categories. Table A-1 entries that were not taken directly from Table A-2 are found in Tables A-3 through A-12.

Table A-1 also provides statistics describing the level of effort for certain activities by numerically representing what or how much was accomplished. References are provided within Table A-1 for the activity statistics. Where relevant statistics are available, normalized costs are calculated in Table A-1. Normalized costs are calculated by dividing the cost of the category or activity by the activity statistic.

For the city of Corona, labor costs of the stormwater staff are not distributed among the cost survey categories. Instead, it is all captured under Overall Stormwater Program Management. Thus, comparing costs with other municipalities where such costs are distributed, Corona's Overall Stormwater Management Program costs will be higher.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

Construction Site Stormwater Runoff Control

The total cost of this category was $53,382. The costs of the construction runoff control category include labor and vehicle usage expenses for inspections and meetings, vehicle usage expense for stormwater staff for follow-up visits, training stormwater staff for construction, and phone costs by stormwater staff. The labor and vehicle cost for inspections was taken directly from Table A-2. These inspections were performed by the Inspection Division of the Public Works Department (Michele Colbert, personal communication, city of Corona, 3/12/04).

The construction site inspectors also had weekly meetings that covered stormwater issues. City staff estimated that an average of 10 minutes per meeting were spent covering stormwater issues (Michele Colbert, pers. comm., 3/12/04). Table A-8 calculates the cost associated with covering stormwater issues in these meetings, assuming 50 meetings per year.

Follow-up visits for coordination and advisement were performed by the stormwater staff. As mentioned before, these labor costs are not allocated to the construction category because it was

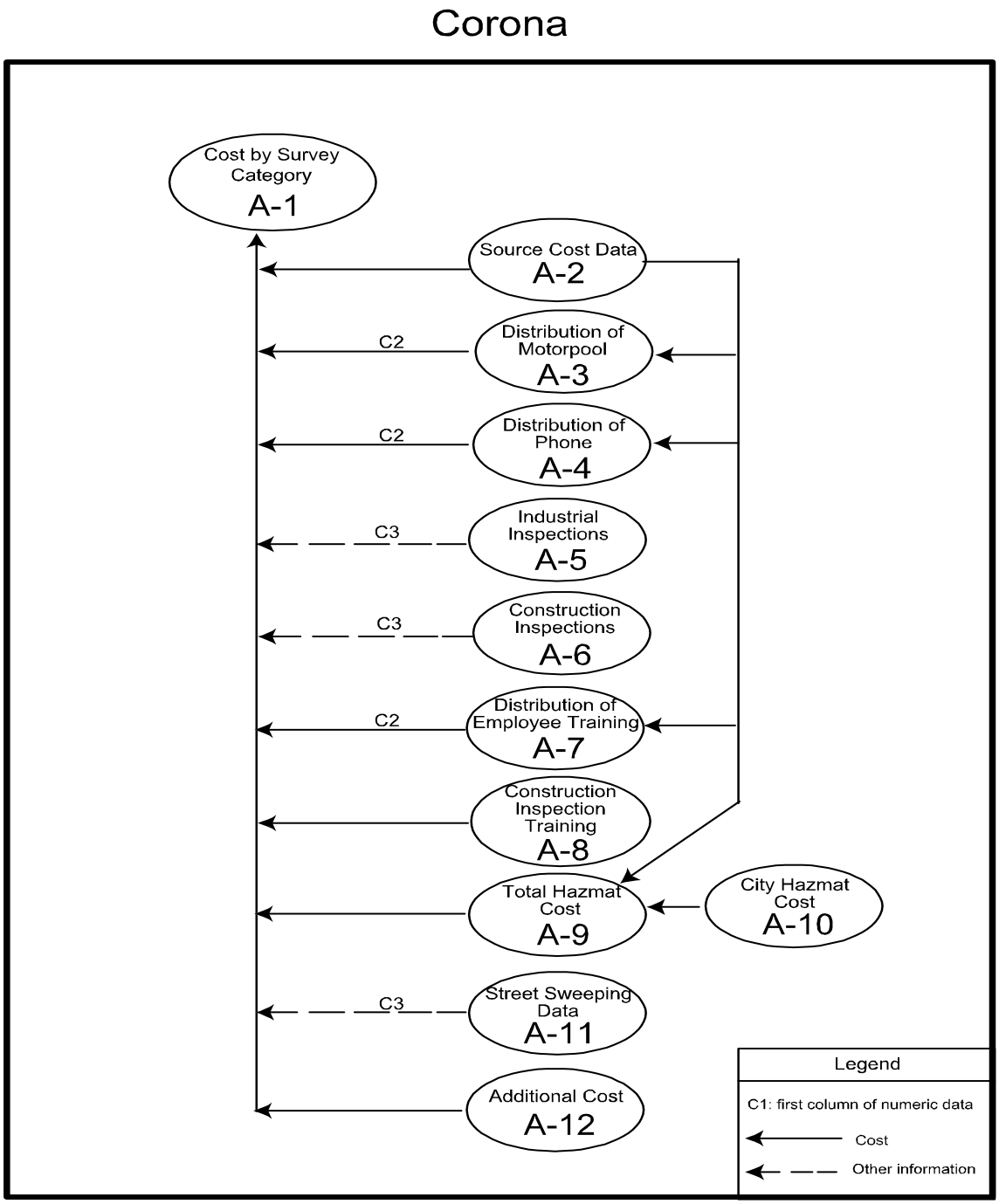

Figure A-1. Corona Flowchart of Cost Tables

difficult for city staff to estimate the distribution of stormwater staff time to the various categories. The allocation of vehicle usage by stormwater staff was estimated by percentages provided by city staff (Michele Colbert, pers. comm., 3/12/04). This information was used in Table A-3 in conjunction with the total cost in Table A-2 to estimate the cost of the vehicle for the construction category. Likewise, the phone charges used on these visits were allocated to construction in Table A-4.

The city of Corona incurred employee training costs (item 26, Table A-2) that had a portion allocated to the construction category in Table A-7 according to percentages provided by city staff (Michele Colbert, pers. comm., 3/12/04).

City staff provided information regarding construction site inspections, which were summarized in Table A-6. Total inspections were calculated in Table A-6 to be 564. The overall normalized cost, calculated by dividing the total cost of the category by the number of inspections is $95/inspection.

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $20,628. The IDDE program was implemented by the source control division and public works inspection division of the city of Corona. The costs attributed to this category were for the stormwater share of inspections performed by source control staff and inspection staff for other illicit connections at industrial, commercial, and new development sites (Table A-2). The source control inspection cost was developed by estimating how much time inspectors took looking for illicit discharges while doing regular inspections of industrial and commercial sites (3,050). Seventy such inspections were made during the 2002/03 fiscal year. The normalized cost calculated by dividing the total cost of the category by the number of inspections, is $295/inspection.

Industrial and Commercial Management Programs

The total cost of this category was $89,916. This program used public works department staff to perform inspections. This cost was taken directly from Table A-2.

As in the construction category, the stormwater staff had vehicle and phone usage expenses to perform follow-up inspections and meetings for industrial facilities. These costs were based on Table A-2, items 14 and 15 and the allocations were calculated in Tables A-3 and A-4.

Training of stormwater staff for this program was allocated according to Table A-7.

Overall Stormwater Program Management

The total cost of this category was $317,800. As discussed previously, stormwater staff costs were not distributed to the other categories. Stormwater staff labor costs are found in Table A-2, items 18 through 21. These costs are loaded costs that include salary, benefits, insurance, etc. Office supplies, telephone, and postage are taken directly from Table A-2, items 24 and 25. The cost of reporting was taken from Table A-2, item 34. Reporting costs paid for updating the Drainage Area Master Plan (DAMP). While not specifically required in the permit the information contained in the report is. For example, the city must address flow velocity and runoff value increases for new development (Permit, R8-2002-0011 section VIII.8-e). The information in the DAMP also allows the city to track spills and identify regional BMPs. The "administration services" charge is taken from Table A-2, item 27. This charge includes the allocation to stormwater for buildings, payroll, accounting, legal, and other overhead charges (Michele Colbert, pers. comm., 3/12/04).

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost of this category was $720,222. The city of Corona contracted for street sweeping services for 2002/03. These costs are shown in Table A-2, items 1 and 2. The number of curb miles swept was provided by city staff as a stand-alone worksheet. This worksheet is reproduced in Table A-11. The personnel cost of $14,000 (Table A-2, item 2) represents labor cost for the city of Corona to oversee the street sweeping contractor. The cost per curb mile swept ($20) is calculated based on total street sweeping costs.

Drain line and channel cleaning was performed in-house. The equipment rental, labor, and vehicle rental costs are presented in Table A-2 (items 3, 4, and 5 respectively). The normalized cost for this activity is based on the sum of these three costs and the total linear feet of maintained channels and drain lines. The costs for each type of facility could not be separated. Twenty-nine percent of the total linear feet was drain pipe and 71 percent was channels (Corona, 2003a).

Corona also incurred costs for hazardous material spill response. Public works and fire departments incurred costs implementing this program. These costs are calculated in Table A-9 and are based on a stand-alone worksheet provided by city staff reproduced as Table A-10. The normalized costs for hazmat responses ($465/response) are based on the total costs divided by the total number of responses.

Cost for the maintenance of the storm drain geographic information system (GIS) was taken directly from Table A-2.

The allocation of stormwater staff training expenses related to this category are calculated in Table A-7, based on Table A-2, item 26.

The cost incurred by the fire department for implementing SWPPPs for its nine fire stations are taken directly from Table A-2, item 23.

Post Construction Stormwater Management in New Development and Redevelopment

The total cost of this category was $13,509. The city staff identified two costs for this category. Both are taken directly from Table A-2. The professional services costs were for a consultant that advised the city on selection of post-construction BMPs. The drain inlet insert maintenance cost was for 8 drain inlet inserts. The normalized cost calculation gives an approximate cost per drain inlet insert of $563/insert. This normalized value is not expected to be useful in comparing program costs as part of this cost survey.

Public Education and Outreach and Public Involvement and Participation

The total cost of these categories was $28,409. The city did not track these costs separately and dividing the costs would be an artificial exercise (Michele Colbert, pers. comm., 3/12/04). All the costs for these two categories were taken directly from Tables A-2 and A-12. The descriptions for these categories in the annual report did not contain statistics that would be

useful for normalizing the costs of these categories. This was confirmed in the meetings with city staff.

Water Quality Monitoring

The total cost of this category was $7,000. The cost incurred for monitoring was for ad hoc testing in support of the IDDE program. This cost can be found in Table A-2, item 31.

References

City of Corona. 2003a. "Comprehensive Annual Financial Report, 30 June 2003" http://www.ci.corona.ca.us/depts/finance/cafr03/index.cfm (18 March 2004)

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Table A-1. Corona Cost Organized by Cost Survey Category

Cost Survey Categories

Activity Descriptions

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Inspections by Public Works department		New	46,184.00	Table A-2, Item 13	86.5%	564	inspections	Table A-6	81.89	$/inspection
Share of stormwater issues in weekly inspector meetings		New	6,013.50	Table A-8	11.3%	9	person days	Calculation	641.44	$/person day
Share of vehicle used by stormwater staff for construction		New	419.40	Table A-3	0.8%					
Share of phone used by stormwater staff for construction		New	28.25	Table A-4	0.1%					
Share of training for stormwater staff for construction	x	New	736.67	Table A-7	1.4%	9	person days	Calculation	78.58	$/person day
Total			53,381.82		4.3%	of total stormwater cost				

Overall Cost Category Normalizations						
total category $ per inspection	564	inspections	Table A-6	94.65	total $/inspection	
total category $ per active construction site	41	active construction sites	Colbert, pers. comm., 3/12/04	1,302.00	total $/active construction site	

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Stormwater share of inspections by wastewater staff		New	11,007.00	Table A-2, Item 22	53.4%	70	inspections	Colbert, pers. comm., 4/28/04	157.24	$/inspection
Illicit connection inspections		New	9,621.00	Table A-12	46.6%	20	inspections	Colbert, pers. comm., 4/28/04	481.05	$/inspection
Total			20,628.00		1.6%	of total stormwater cost			294.69	total $/sw inspection

Industrial and Commercial Management Programs

Description	External Contract	Nature	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Inspections		New	80,674.00	Table A-2, Item 11	89.7%	600	inspections	Table A-5	134.46	$/inspection
Share of vehicle used by stormwater staff for industrial programs		New	7,968.60	Table A-3	8.9%					
Share of phone used by stormwater staff for industrial programs		New	536.75	Table A-4	0.6%					
Share of training for industrial programs		New	736.67	Table A-7	0.8%					
Total			89,916.02		7.2%	of total stormwater cost				

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
100% Public Works staff		New	94,476.00	Table A-2, Item 18	29.7%					
50% Public Works staff		New	59,938.00	Table A-2, Item 19	18.9%					
30% Public Works staff		New	34,874.00	Table A-2, Item 20	11.0%					
10% Public Works staff		New	6,196.00	Table A-2, Item 21	1.9%					
Office supplies and publications		New	730.00	Table A-2, Item 24	0.2%					
Telephone and postage		New	1,200.00	Table A-2, Item 25	0.4%					
Administrative service charges		New	79,367.00	Table A-2, Item 27	25.0%					
NPDES fee		New	18,516.00	Table A-2, Item 28	5.8%					
Reporting-Drainage Master Plan		New	22,503.00	Table A-2, Item 34	7.1%					
Total			317,800.00		25.4%	of total stormwater cost				

Table A-1. Continued.

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Street Sweeping						20,877	curb miles swept	Table A-11	19.84	$/curb mile swept
Street sweeping contract	x	Enhanced	400,215.00	Table A-2, Item 1	55.6%					
Oversight of street sweeping		New	14,000.00	Table A-2, Item 2	1.9%					
Drain lines/channel cleaning						30,305	linear feet inspected	Corona, 2003b	8.30	$/linear foot
Equipment rental		Enhanced	36,211.00	Table A-2, Item 3	5.0%					
Personnel		Enhanced	188,856.00	Table A-2, Item 4	26.2%					
Vehicle rental		Enhanced	26,568.00	Table A-2, Item 5	3.7%					
Hazmat Response						41	responses	Table A-10	465.15	$/response
Public Works		Existing	9,621.10	Table A-9	1.3%					
Fire		Existing	9,450.00	Colbert, 2004	1.3%	47	responses	Colbert, pers. comm., 6/16/04	201.06	$/response
GIS maintenance for storm drains		New	6,300.00	Table A-2, Item 33	0.9%					
Share of training for municipal operations	x	New	736.67	Table A-7	0.1%					
Fire department cost for SWPPP implementation		New	9,685.00	Table A-2, Item 23	1.3%	9	fire stations	Colbert, pers. comm., 4/28/04	1,076.11	$/station
Disposal costs for hazardous waste	x	Existing	12,101.68	Table A-12	1.7%					
Hazmat waste operator training classes	x	Existing	6,478.00	Table A-12	0.9%					
Total			720,222.45		57.6%	of total stormwater cost				

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Professional services (consultant)	x	New	9,009.00	Table A-2, Item 29	66.7%					
Drain inlet insert maintenance		New	4,500.00	Table A-2, Item 35	33.3%	8	inserts	Colbert, pers. comm., 3/12/04	562.50	$/insert
Total			13,509.00		1.1%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Contribution to regional clean air public education program		New	4,000.00	Table A-2, Item 7	14.1%					
Contribution to countywide public education program		New	12,063.00	Table A-2, Item 8	42.5%					
Response to public stormwater complaints		New	8,700.00	Table A-2, Item 12	30.6%					
Share for stormwater education in new business brochures		New	300.00	Table A-2, Item 30	1.1%					
Household Hazardous Waste Collection Event		New	3,346.00	Table A-12	11.8%					
Total			28,409.00		2.3%	of total stormwater cost				

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Laboratory testing for illicit discharge program	x	New	7,000.00	Table A-2, Item 31	100.0%					
Total			7,000.00		0.6%	of total stormwater cost				

Total Stormwater Costs	1,250,866.28

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

Table A -2. Primary Cost Data for Corona

Item #	City of Corona Category	Total Cost	Cost Survey Category[1]
	Street Cleaning/Sweeping		
1	Annual Street Sweeping Contract Cost	400,215	Pollution Prevention
2	Personnel Cost	14,000	Pollution Prevention
	Storm Drain Cleaning		
3	Equipment Rental	36,211	Pollution Prevention
4	Personnel Cost	188,856	Pollution Prevention
5	Motor Pool Rental	26,568	Pollution Prevention
	Public Education		
6	Personnel Time	0	
7	WRCOG - Clean Cities	4,000	Public Education
8	County Implementation Agreement	12,063	Public Education
	Hazmat Reponse		
9	Cost for Fire Dept.	5,000	Pollution Prevention
	Plan Check Activity		
10	Plan Check Activity	0	
	Ordinance Enforcement Activities		
11	Industrial/Commercial Inspection & Follow-Up	80,674	Industrial
12	Residential	8,700	Public Education
13	Construction (Inspection Costs)	46,184	Construction
14	Motorpool (Explorer)	8,388	See Table A-3
15	Phone	565	See Table A-4
	Code Compliance		
16	Code Compliance	0	
	Permit Administration		
17	Personnel Expenses:	0	
18	Michele (100%)	94,476	Management
19	Nabil (50%)	59,938	Management
20	Ati (30%)	34,874	Management
21	Tracy (10%)	6,196	Management
22	Source Control (10%)	11,007	Illicit Discharge
23	Fire Dept. (10%)	9,685	Pollution Prevention
24	Office Supplies and Publications	730	Management
25	Telephone and Postage	1,200	Management
26	Employee Training and Conference	2,210	See Table A-7
27	Administrative Service Charges	79,367	Management
28	Regional Water Quality Control Board	18,516	Management
29	Professional Services	9,009	Post Construction
30	Public Education and Information	300	Public Education
31	Laboratory Testing	7,000	Monitoring
32	Structural BMP	0	
33	GIS Citywide Storm Drain System	6,300	Pollution Prevention
34	Drainage Master Plan	22,503	Management
	NPDES Facilities Mitigation		
35	Facilities Mitigation	4,500	Post Construction
	Total	1,199,235	

(Source: Colbert, pers. comm., 3/12/04)

1. Cost Categories Abbreviated According to the Following:
   Construction: Construction Site Stormwater Runoff Control
   Illicit Discharge: Illicit Discharge Detection and Elimination
   Industrial: Industrial and Commercial Management Programs
   Management: Overall Stormwater Program Management

Table A – 2. Continued.

Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
Post Construction: Post Construction Water Management in New Development and Redevelopment
Public Education: Public Education, Outreach, Involvement, and Participation
Monitoring: Water Quality Monitoring
Watershed: Watershed Management

Table A-3. Distribution of Motorpool (Explorer) between Construction and Industrial/Commercial Programs

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
8,388.00	Table 2, Item 14	95%	Industrial/Commercial	Colbert, pers. comm., 4/28/04	7,968.60
8,388.00	Table 2, Item 14	5%	Construction	Colbert, pers. comm., 4/28/04	419.40
Total		100%			8,388.00

Table A-4. Distribution of Phone between Construction and Industrial/Commercial Programs

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
565.00	Table 2, Item 15	95%	Industrial/Commercial	Colbert, pers. comm., 4/28/04	536.75
565.00	Table 2, Item 15	5%	Construction	Colbert, pers. comm., 4/28/04	28.25
Total		100%			565.00

Table A-5. Calculation of Inspections for Industrial Management Programs

Site Type	Source	Annual Inspections	Reference	Inspections	
High Priority	600	1	Colbert, pers. comm., 3/12/04	600	
Medium Priority	540	0.5	Colbert, pers. comm., 3/12/04	0	*
Low Priority	1,910	0.2	Colbert, pers. comm., 4/28/04	0	*
Totals	3,050			600	

* inspections started in 03/04, not inspected in 02/03

Table A-6. Calculation of Inspections for Construction Site Stormwater Runoff Control Programs

Site Type	Number	Annual Inspections	Reference	Inspections
High Priority	6	24	Colbert, pers. comm., 3/12/04	144
Low Priority	35	12	Colbert, pers. comm., 3/12/04	420
Totals	41			564

Table A-7. Distribution of Employee Training Among

Cost	Source	Percent Allocation	Category	Allocated Cost
2,210.00	Table 2, Item 26	33%	Construction	736.67
2,210.00	Table 2, Item 26	33%	Industrial/Commercial	736.67
2,210.00	Table 2, Item 26	33%	Municipal	736.67
Total		100%		2,210.00

(Source: Colbert, pers. comm., 3/12/04)

Table A-8. Cost of Fraction of Construction Inspectors Weekly Meetings Dedicated to Stormwater Issues

Description	Dollar Amount or Statistic	Reference
Meetings per year	50	Corona, 2003b
Minutes per meeting for stormwater issues	10	Colbert, pers. comm., 3/12/04
Number of person hours	9	Calculation
Overhead Rate	$ 80.18	Colbert, pers. comm., 3/12/04
Labor Cost	$ 6,013.50	Calculation

Table A-9. Calculation of Hazmat Response Cost for Municipal Operations Program

Cost Type	Amount	Source
Fire Department	5,000.00	Table A-2, Item 9
Equipment	1,040.88	Table A-10
Materials	171.42	Table A-10
Labor	3,408.80	Table A-10
Total	9,621.10	

Table A-10. Hazardous Materials Worksheet Submitted by City of Corona Staff

Actvity PHAZM	Haz Mat Cleaned Up
Number of jobs	41
Labor Hours	129.75
Labor Cost	3,408.80
Equipment Hours	69.82
Equipment Cost	1,040.88
Materials Cost	171.42
Total Cost	**4,621.10**
Average Cost/Job	112.71
Average Labor Hours/Job	3.16
Average Equipment Hours/Job	1.70

(Source: Colbert, pers. comm., 3/12/04)

Table A-11. Street Sweeping Analysis Submitted by City of Corona Staff

Service Type	Curb Miles	Services/Year	Annual Miles	Percentage	
Residential	655	26	17,019	82%	84%
Alleys (Residential)	38	12	450	2%	
Commercial	54	52	2,786	13%	16%
Medians/Inter (Commercial)	52	12	622	3%	
Totals	797		20,877	100%	100%

(Source: Colbert, pers. comm., 3/12/04)

Table A-12. Additional Costs Identified and Submitted by the City of Corona Staff

Activity Description	Cost	Stormwater Program
Planning and labor for Household Hazardous Waste Collection Event	3,346.00	Public Education
Disposal costs for hazardous waste	12,101.68	Pollution Prevention
Hazmat waste operator training classes	6,478.00	Pollution Prevention
Illicit connection inspections	9,621.00	Ilicit Discharge
Total	31,546.68	

(Source: Colbert, pers. comm., 5/18/04)

The backup calculations for the cost for each cost survey category in Section 4 and the sources of the cost data are presented in this appendix. Tables are generally presented by sequentially increasing levels of detail. Figure B-1 illustrates how data is shared throughout the tables.

Table B-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 4, Table 4-2. The remaining tables (B-2 through B-6) present the detailed back-up information for the numbers in Table B-1. Table B-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table B-2. Item numbers corresponding to the subtotals in Table B-2 were added to the left hand column to easily show how the numbers are pulled forward to Table B-1. The right hand column in Table B-2 was added to show how costs were allocated to the cost survey categories. Table B-1 entries that were not taken directly from Table B-2 are found in Tables B-3 through B-6.

For the city of Encinitas, labor, supplies, travel, equipment, and vehicle costs are distributed among the various survey categories according to estimates provided by city staff (Table B-3). Thus, comparing costs with other municipalities where such costs are not distributed, Encinitas's Overall Stormwater Management Program costs will be lower.

City staff has projected new capital projects and labor that will immediately increase their costs over the next few years. Additional labor costs will relate to engineering inspections, planning, and plan checking. Capital project costs will include installation of filter inserts, fire station wash facilities, and a storm drain. Additional operation and maintenance costs will be incurred relating to these capital projects as well.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

Construction Site Stormwater Runoff Control

The total cost of this category was $169,751. The city of Encinitas Building Department staff performed all 401 inspections during the wet season spanning from October 1, 2002 to April 30, 2003 (Encinitas, 2003b). The normalized cost, calculated by dividing the total cost of the category by the number of inspections, is $423/inspection. The stormwater staff also conducted the following activities in the construction category (descriptions obtained from annual stormwater report):

- Reviewed 5 SWPPPs
- General enforcement
- Issued 13 Notices of Violation
- Monitored weather patterns and storms in the Pacific through the National Weather Service

The costs presented in Table B-1 for the construction category include all of these activities and does not solely represent the cost for inspections. This should be considered when comparing the normalized cost per inspection for the city of Encinitas to other cities.

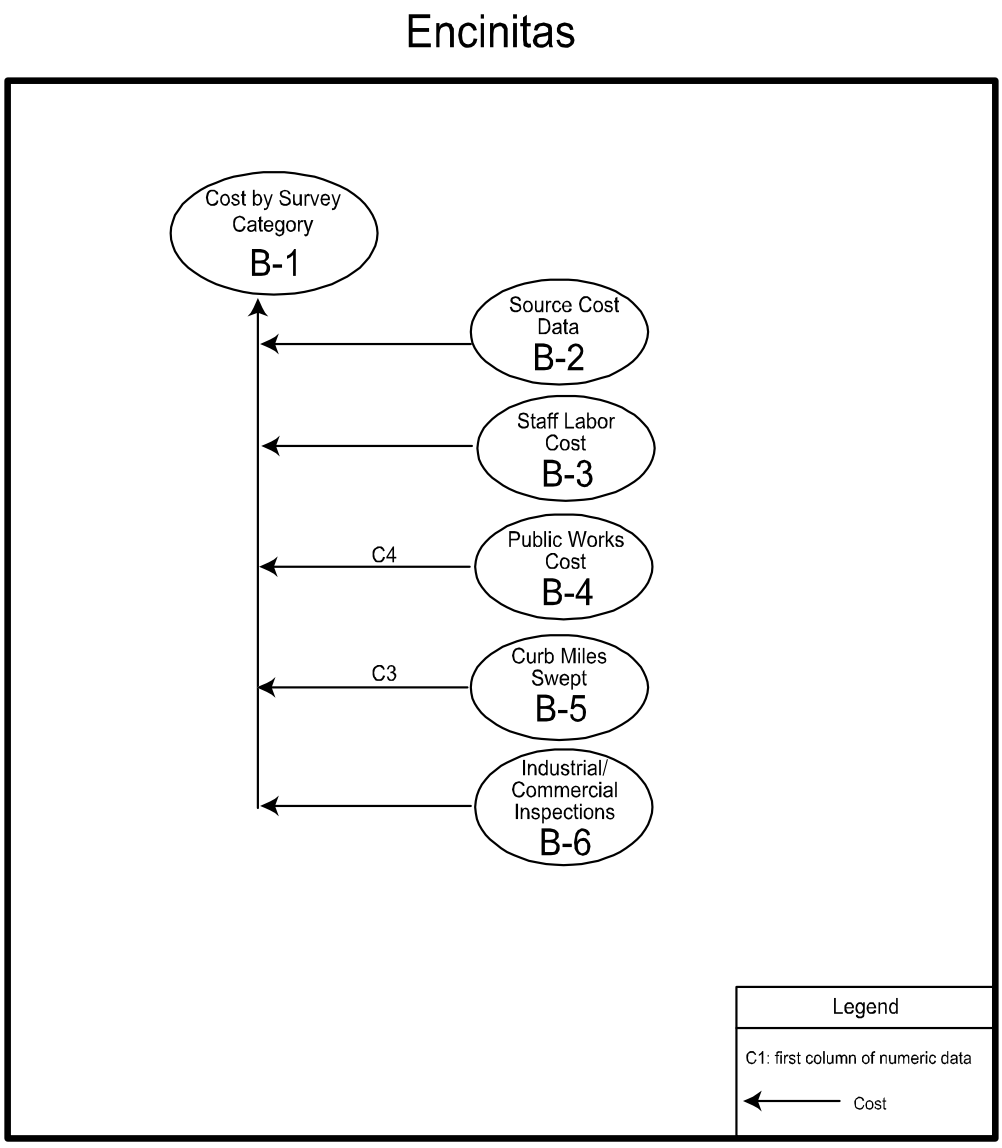

Figure B-1. Encinitas Flowchart of Cost Tables

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $49,378. The IDDE program was implemented by the stormwater staff. The program consists of dry weather monitoring, investigating complaints, and looking for illicit connections during regular inspections and visual inspections of the MS4 (Encinitas, 2003b). The number of inspections for the IDDE program was not available because city staff did not have a formal inspection program. However, 76 "complaints" were filed by city staff from the informal visual inspections. Another 96 complaints were received via the city's stormwater hotline. There were 172 follow up actions to these complaints. (Encinitas, 2003b).

Consequently, cost is normalized by dividing the total cost of the category by the number of follow-up activities resulting in a normalized cost of $287 per follow-up action.

Industrial and Commercial Management Programs

The total cost of this category was $65,596. Costs for this category included consultant administration services and costs for inspections. During 2002/2003, the city performed 266 industrial and commercial inspections (Table B-6). The normalized cost per inspection was $247. The city is planning on increasing inspections to 400 per year (Weldon, pers. comm., 4/2/04), which means this cost will significantly increase. Monitoring is performed at each industrial facility on an on-going basis (Encinitas, 2003b). Activities performed by the stormwater staff relating to the commercial component of this category are as follows (descriptions obtained from the annual stormwater report):

- Updated commercial facility inventory
- Provided BMP manuals and guidance
- Educated facility staff in regard to stormwater requirements and minimum BMPs
- Began development of a grease program
- Issued several enforcement actions

The costs presented in Table B-1 for this category include the cost for all of these activities and do not solely represent the cost for inspections. This should be considered when comparing the normalized cost per inspection for the city of Encinitas to other cities.

Overall Stormwater Program Management

The total cost of this category was $128,159. The city had a cost of $35,000 for developing a stormwater fee. The other activities in this category were for annual reporting and legal support for developing ordinances and plaintiff attorney fees.

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost of this category was $528,252. The largest cost of this category was street sweeping, which cost $117,962. Drain line and channel cleaning cost was $114,711 while sump, inlet, and manhole cleaning cost was $258,113. Additional activities performed were as follows (descriptions obtained from annual stormwater report):

- Engineering services for oversight, strategic planning, and management
- Trash pick-up
- Disposal of sediment
- Performed capital projects
- Updated municipal inventory

Tables B-1 and B-4 contain a breakdown of costs.

Post Construction Stormwater Management in New Development and Redevelopment

The total cost for this category was $15,344. This cost includes storm drain insert installation and maintenance costs (Weldon, pers. comm., 4/2/04). Also, professional services for UV consulting, administration, report preparation, and presentations were acquired in regard to the Moonlight Beach project.

Public Education and Outreach and Public Involvement and Participation

The total cost of these categories was $41,898. These categories were combined for the city of Encinitas due to major overlap between the two. All direct costs came directly from the data in Tables B-2 and B-4. Statistics were only available for the number of posters distributed. Activities in this category included the following (descriptions obtained from annual stormwater report):

- Dissemination of general stormwater brochures
- Stencils placed at all inlets
- Updated city website with stormwater related information
- Dissemination of door hangers
- Design, purchase, and dissemination of promotional key chains
- Dissemination of pens
- Published 9 local newspaper articles with information regarding the city's Clean Water Program and its accomplishments
- Production and dissemination of a general stormwater poster at public events
- Training of city staff
- Made two presentations to the city council and public attendees; an estimated 20 people were present at each meeting
- Printed materials were provided to contractors and developers via brochures
- Held a 2-hour construction workshop to inform the construction and development community about stormwater regulations and BMP requirements; 50 people attended
- Sent two special mailings relating to stormwater issues were sent to developers and contractors
- Special mailers were sent to restaurants and automotive businesses
- Held a workshop with the local nursery constituency to present nursery BMPs
- Held "garden care" type workshops; approximately 46 people attended
- Performed stormwater sampling with a 5th grade class and made a presentation

- Presented the watershed model to a 3rd grade class; approximately 200 children participated in the presentation
- Initiated a collaborative workgroup of several cities in the North County to develop educational outreach products and approaches on a watershed basis
- Held commercial business workshops
- Participated in a public opinion survey
- Held several community events

Water Quality Monitoring

The total cost for this category was $76,262. Costs were not normalized because they vary according to type of water quality analysis performed.

Watershed Management

The total cost for this category was $12,400. These costs consisted of watershed plan development costs and stormwater staff labor costs.

References

City of Encinitas, 2003. "City of Encinitas Stormwater Annual Report" 2003

Table B-1. Encinitas Cost Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Construction inspections		New	150,000.00	Table B-2, Item 28	88.4%	401	inspections	Encinitas 2003b	374.06	$/inspection
Allocated labor		New	19,751.20	Table B-3	11.6%					
Total			169,751.20		15.6%	of total stormwater cost				

Overall Cost Category Normalizations					
total category $ per inspection	401	inspections	Encinitas 2003b	423.32	total $/inspection
total category $ per active construction site	40	active construction sites	Encinitas 2003b	4,243.78	total $/active constructtion site

Illicit Discharce Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Allocated labor		New	49,378.00	Table B-3	100.0%	172	follow-up activities	Encinitas 2003b	287.08	$/follow-up activitiy
Total			49,378.00		4.5%	of total stormwater cost				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Inspections						266	inspections	Table B-6	246.60	$/inspection
D-Max	x	New	43,600.00	Table B-2, Item 13	66.5%					
Ashford Engineering	x	New	12,120.00	Table B-2, Item 14	18.5%					
Allocated labor		New	9,875.60	Table B-3	15.1%					
Total			65,595.60		6.0%	of total stormwater cost				

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Annual reporting (ashford)	x	New	25,080.00	Table B-2, Item 23	19.6%					
Storm water fee development		New	35,000.00	Table B-2, Item 29	27.3%					
Miscellaneous		New	520.73	Table B-2, Item 27	0.4%					
NPDES fee		New	3,750.00	Table B-2, Item 5	2.9%					
Legal fees-ordinances	x	New	11,915.50	Table B-2, Item 25	9.3%					
Legal fees-plaintiff attorneys	x	New	9,950.00	Table B-2, Item 26	7.8%					
Grant writing		New	2,440.00	Table B-2, Item 24	1.9%					
Allocated labor		New	39,502.40	Table B-3	30.8%					
Total			128,158.63		11.8%	of total stormwater cost				

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Ashford Engineering	x	New	8,840.00	Table B-2, Item 7	1.7%	4	inspections	Encinitas 2003b	2,210.00	$/inspection
Trash pick-up		Existing	2,850.00	Table B-2, Item 12	0.5%					
Trash pick-up (public works)		Existing	13,400.00	Table B-4	2.5%					
Disposal of sediment		New	2,500.00	Table B-2, Item 8	0.5%					
Allocated labor		New	9,875.60	Table B-3	1.9%					
Sumps, inlets, manholes		Enhanced	258,113.00	Table B-4	48.9%					
Drain lines and channels		Enhanced	114,711.00	Table B-4	21.7%					
Street sweeping		Enhanced	117,962.00	Table B-4	22.3%	5,832	curb miles swept	Table B-5	20.23	$/curb mile swept
Total			528,251.60		48.6%	of total stormwater cost				

Table B-1. Continued.

Post Construction Water Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Overall Storm Drain Inserts Maintenance						16	inserts installed	Encinitas, 2003b	119.25	$/insert installed
Storm drain inserts		New	1,240.00	Table B-2, Item 9	8.1%					
Storm drain inserts		New	668.01	Table B-2, Item 10	4.4%					
Ashford Engineering (moonlight)	x	New	3,560.00	Table B-2, Item 11	23.2%					
Allocated labor		New	9,875.60	Table B-3	64.4%					
Total			15,343.61		1.4%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Surveys and posters		New	3,292.47	Table B-2, Item 20	7.9%					
Surveys and posters		New	2,000.00	Table B-2, Item 21	4.8%					
UC Extension workshop with nurseries.		New	2,374.00	Table B-2, Item 15	5.7%					
Ashford engineering	x	New	14,480.00	Table B-2, Item 22	34.6%					
Allocated labor		New	19,751.20	Table B-3	47.1%					
Total			41,897.67		3.9%	of total stormwater cost				

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Wet weather monitoring		New	25,186.00	Table B-2, Item 6	33.0%					
ICID dry weather monitoring		New	14,893.00	Table B-2, Item 16	19.5%					
ICID dry weather monitoring		New	3,161.00	Table B-2, Item 17	4.1%					
ICID dry weather monitoring		New	3,395.00	Table B-2, Item 18	4.5%					
Allocated labor		New	29,626.80	Table B-3	38.8%					
Total			76,261.80		7.0%	of total stormwater cost				

Watershed Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Watershed plan development		New	2,524.00	Table B-2, Item 19	20.4%					
Allocated labor		New	9,875.60	Table B-3	79.6%					
Total			12,399.60		1.1%	of total stormwater cost				

Total stormwater costs	1,087,037.71

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

Table B-2. Source Data Table Submitted by City of Encinitas (cost survey categories added)

Item #	City of Encinitas Category	Cost	Cost Survey Category[1]
1	Staff Salary	147,760.00	See Table B-3
2	Contract Staff	41,743.00	See Table B-3
3	Supplies/Travel/Equipment	5,409.00	See Table B-3
4	Vehicle	2,600.00	See Table B-3
	Permit Fees:		
5	State Water Resources Control Board	3,750.00	Management
6	Copermittee MOU Fees	25,186.00	Monitoring
	Municipal Programs:		
	Miscellaneous Contracting		
7	Ashford Engineering	8,840.00	Pollution Prevention
8	AMEC	2,500.00	Pollution Prevention
9	BMP Implementation & Maintenance	1,240.00	Post Construction
10	Downstream Services	668.01	Post Construction
11	Ashford Engineering (Moonlight)	3,560.00	Post Construction
12	Clean Up/Abatement Programs	2,850.00	Pollution Prevention
	Industrial/Commercial Programs:		
	Inspections		
13	D-Max	43,600.00	Industrial
14	Ashford Engineering	12,120.00	Industrial
	Nursery Program:		
	Inspections		
15	Education Activities (UC Regents)	2,374.00	Public Education
	Construction Programs:	0.00	
	IC/ID Program:		
	Source Tracking/Spills/Inspections	0.00	
	Water Quality Monitoring:		
16	Encina	14,893.00	Monitoring
17	Del Mar Analytical	3,161.00	Monitoring
18	San Elijo JPA	3,395.00	Monitoring
	Watershed Urban Runoff Management:		
19	Ashford Engineering	2,524.00	2 Watershed
20	City of Oceanside (survey& posters)	3,292.47	Public Education
21	City of Carlsbad (survey)	2,000.00	Public Education
	Education:		
22	Ashford Engineering	14,480.00	Public Education
	Reporting (JURMP/WURMP Annual Report):		
23	Ashford Engineering	25,080.00	Management
24	Grant Writing:	2,440.00	Management
	Legal Fees:		
25	Glenn Sabine	11,915.50	Management
26	Marco Gonzalez	9,950.00	Management
27	Misc.: BMP Cottonwood Creek & San Elijo Outlet	520.73	Management
28	Construction	150,000.00	Construction
29	Appropriation for Stormwater Fee Vote	35,000.00	3 Management
30	B&D Construction	35,887.00	4 Unallocated
	Total Expenditures	618,738.71	

(Source: Weldon, pers. comm., 4/2/04)

1. Cost Categories Abbreviated According to the Following:
   Construction: Construction Site Stormwater Runoff Control
   Illicit Discharge: Illicit Discharge Detection and Elimination
   Industrial: Industrial and Commercial Management Programs
   Management: Overall Stormwater Program Management

Table B-2. Continued.

Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
Post Construction: Post Construction Water Management in New Development and Redevelopment
Public Education: Public Education, Outreach, Involvement, and Participation
Monitoring: Water Quality Monitoring
Watershed: Watershed Management

2. Per personal communication with Kathy Weldon, this number was reduced to $2,524 from $12,880.
3. Per personal communication with Meleah Ashford, this number was reduced to $35,000 from $100,000.
4. Construction of storm drain was not attibuted to permit compliance.

Table B-3. Distribution of Labor ($189,503) and Supplies/Travel/Equipment/Vehicle ($8,009) Costs Submitted by City of Encinitas Staff

Category	Percent All Clean Water Program Staff	Cost Allocated by Percentages
Public Outreach	5%	9,875.60
Public Involvement	5%	9,875.60
ICID	25%	49,378.00
Construction	10%	19,751.20
Post Construction (SUSMP)	5%	9,875.60
Industrial	5%	9,875.60
Pollution Prevention for Municipal	5%	9,875.60
Monitoring	15%	29,626.80
Overall Stormwater Management	20%	39,502.40
Watershed Management	5%	9,875.60
Total	100%	197,512.00

(Source: Ashford, pers. comm., 4/15/04)

Table B-4. Public Works Cost Data Submitted by City of Encinitas Staff

Description	Cost Type Labor	Equipment	Contract	Total
Sumps, inlets, manholes	101,404.00	72,968.00	83,741.00	258,113.00
Drain lines and channels	101,405.00	13,306.00	0.00	114,711.00
Trash pick-up	0.00	0.00	13,400.00	13,400.00
Street sweeping	0.00	0.00	117,962.00	117,962.00
Total	202,809.00	86,274.00	215,103.00	504,186.00

(Source: Ashford, pers. comm., 4/15/04)

Table B-5. Calculation of Number of Curb Miles Swept

Street Miles Swept	Frequency (yearly)	Reference	Annual Street Miles Swept	Annual Curb Miles Swept[1]
243	12	Encinitas, 2003b	2,916	5,832

1. Calculated by multiplying the "annual street miles swept" by 2.

Table B-6. Calculation of Industrial/Commercial Inspections

Type	Number	Reference
Industrial	3	Encinitas, 2003b
Commercial (DMAX)	202	Encinitas, 2003b
Commercial, nurseries	5	Encinitas, 2003b
Complaint driven (Ashford)	56	Encinitas, 2003b
Total	266	

The backup calculations for the cost for each cost survey category in Section 5 and the sources of the cost data are presented in this appendix. Tables generally are presented by sequentially increasing levels of detail. Figure C-1 illustrates how data is shared throughout the tables.

Table C-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 5, Table 5-2. The remaining tables (C-2 through C-5) present the detailed back-up information for the numbers in Table C-1. Table C-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table C-2. Item numbers corresponding to the subtotals in Table C-2 were added to the left hand column to easily show how the numbers are pulled forward to Table C-1. The right hand column in Table C-2 was added to show how costs were allocated to the cost survey categories. Table C-1 entries that were not taken directly from Table C-2 are found in Tables C-3 through C-5.

Table C-1 also provides statistics describing the level of effort for certain activities by numerically representing what or how much was accomplished. References are provided within Table C-1 for the activity statistics. Where relevant statistics are available, normalized costs are calculated in Table C-1. Normalized costs are calculated by dividing the cost of the category or activity by the activity statistic.

For the city of Fremont, labor costs of the stormwater staff are not distributed among the various survey categories. Instead, it is all captured under Overall Stormwater Program Management. Thus, comparing costs with other municipalities where such costs are distributed, Fremont's Overall Stormwater Management Program costs will be higher.

The Union Sanitation District (USD) is under contract with the city of Fremont to provide facility and illicit discharge services, construction inspections, public education, countywide clean water program meeting participation, reports, database, and vehicles. The breakdown of the USD cost is presented in Table C-4.

The contribution made to the Alameda County Clean Water Program (ACCWP) was allocated according to Table C-5. Table C-5 has the total cost of the ACCWP broken into stormwater program categories. ACCWP supports subcommittee meetings, legal advice, regulatory advice, agency education and information sharing. On the bottom of the table is the dollar amounts contributed from each of the participating agencies. Fremont contributed $339,990 out of the total ACCWP expenses of $2,342,113. The ratio of Fremont contribution to the total ACCWP program cost was used to determine the contribution Fremont made to the individual programs. This calculation is in the far right column of Table C-5.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

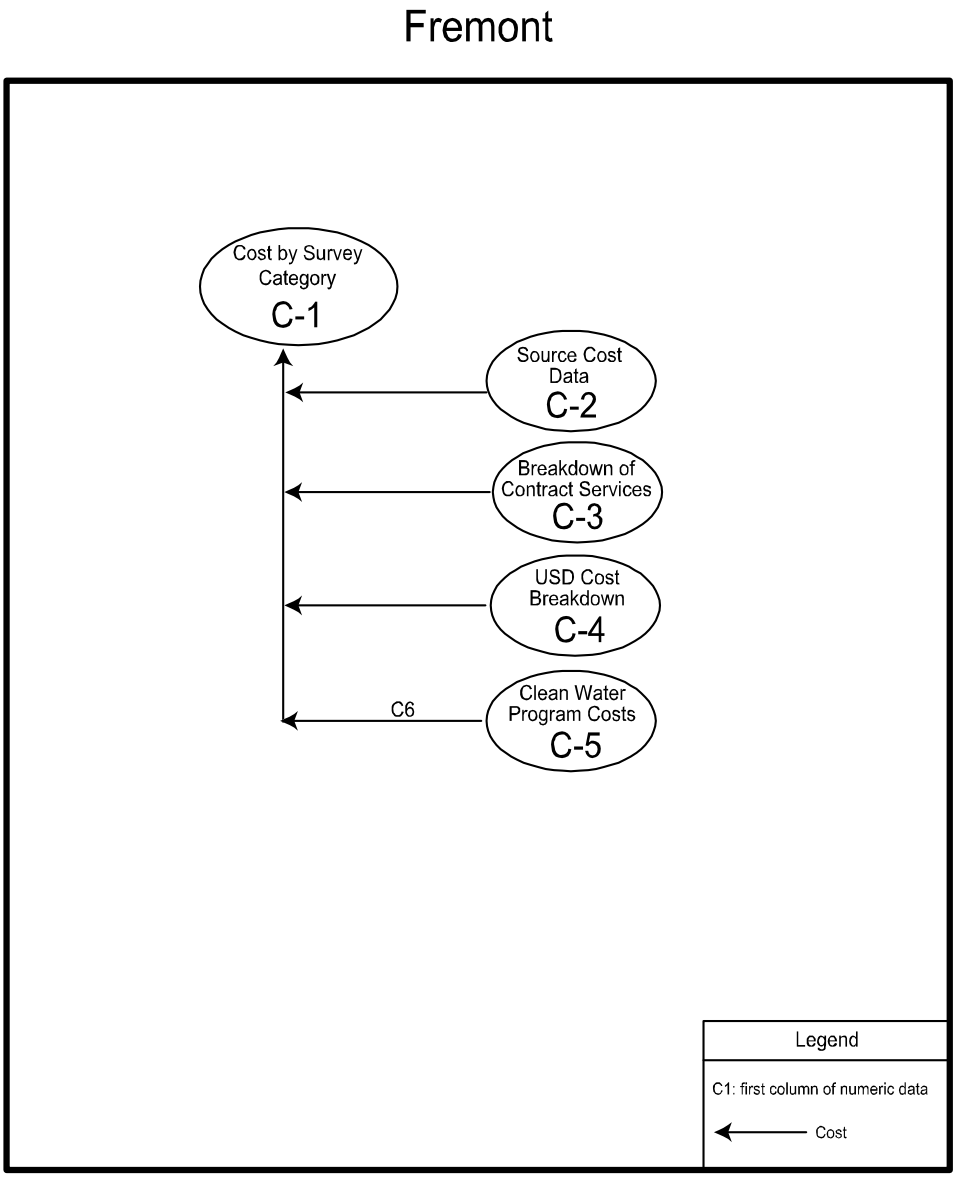

Figure C-1. Fremont Flowchart

Construction Site Stormwater Runoff Control

The total cost of this category was $17,715. The costs of this category were for inspection of active construction sites and for plan checking to verify appropriate post construction BMPs were being used (Fremont, 2003b). Employee training and 58 erosion control inspections were conducted (Fremont, 2003b). USD performed 139 general stormwater inspections.

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $5,917. All of the costs in this category represent contributions to the ACCWP for assistance in eliminating non-stormwater discharges, analyzing

findings, reporting, and staff labor. During the year, 118 follow-up activities were conducted (Fremont, 2003b).

Industrial and Commercial Management Programs

The total cost of this category was $210,027. Most of the activities for this category were performed by USD. A cost breakdown by activity was not provided. The total number of inspections was 482, which includes 91 re-inspections. The city had 81 enforcement actions in 2002/03 and identified and abated 32 "Potential Exposure" and 18 "Non-Stormwater" discharges. (Fremont, 2003b). Inspection documentation costs amounted to $31,697. Though USD also performed some construction inspections, this cost was included here because the majority of inspections were for the industrial/commercial program. Inspection costs were $160,861 resulting in a cost of $436/inspection.

Contributions to the ACCWP totaled $17,469 and were for outreach, refining guidelines, training, and reporting.

Overall Stormwater Program Management

The total cost of this category was $453,872. Sixty-nine percent of the cost allocated to this category was for the stormwater staff labor and allocation of overhead cost. The city staff was unable to distribute the labor costs among the survey categories. Other costs in this category were for USD services, NPDES fees, consultant services, and various administrative costs. USD staff participated in ACCWP subcommittees at a cost of $12,928, $7,659 in reporting costs, $6,107 for meeting attendance, and $135 for mitigation work. The mitigation work was a minor cost and therefore allocated to this cost category rather than investigate for a description of the work.

Contributions to the ACCWP totaled $95,560 and were for regulatory advising, instituting improvements, support committees, legal advice, website, newsletters, dues, permit fees, business water quality incentives, miscellaneous expenses, and staff labor.

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost of this category was $2,128,175. Of this amount, 85 percent was for street sweeping. The costs for this category were for the activities of street sweeping, litter/debris removal, and GIS. The city performed other activities but was unable to provide the associated costs. These activities were cleaning drain lines and channels, inlets, cross culverts, and conduits (Silva, pers. comm., 9/22/04). Additional activities obtained from the annual stormwater report included employee training, maintenance staff attendance at maintenance subcommittee meetings, mailing information packets to new businesses, workshops, partnered with USD to develop, print, and mail a newsletter (Fremont, 2003b).

Contributions to the ACCWP totaled $13,175 and were for performance standard development and updating, and staff labor.

Post Construction Stormwater Management in New Development and Redevelopment

The total cost of this category was $19,746. This cost was for engineering, planning, and city staff to research, track, and report information for the annual stormwater report. It was also for task force meetings to develop strategies for compliance with their permit regarding new development and redevelopment. The source table (C-2) describes this cost as a "quasi-external expenditure" because it is the amount that was transferred to engineering and other departments to cover stormwater related activities.

Contributions to the ACCWP totaled $15,337 and were for controls guidance, watershed inventory, construction activities, performance standards, coordination, brochures, and staff labor.

Public Education and Outreach and Public Involvement and Participation

The total cost allocated to these categories was $101,717. Advertising costs (including billboards and newsletters) were for public education and outreach. Creek clean-up had both public involvement, participation, and outreach components. Due to this overlap, the programs were combined for the city of Fremont. Approximately 70 percent of the creek clean-up was done by city staff and volunteers accounted for 30 percent of the effort (Silva, pers. comm., 9/22/04). Other activities in these categories included the following (descriptions obtained from the annual stormwater report):

- 24 school outreach presentations to 5th grade classrooms
- 4 school outreach presentations at middle school "special day" classes
- Stormwater staff participated in a Safety Fair at Gomez Elementary by doing a watershed demonstration and distributing pamphlets
- Stormwater staff participated in several public events including the Fremont Festival of the Arts, Good Neighbor Day, Boston Scientific Health and Wellness Fair, and National Night Out
- Rock Steady Juggling performance to 1,490 students who were educated about urban runoff issues
- Educated 680 students about urban runoff issues at the Caterpillar Puppet show
- Participated in and helped fund the "Kids in Creek" workshops
- A city of Fremont staff member served as a panelist at California State University Hayward's "Careers in the Environmental Sciences". The staff member discussed career opportunities in the stormwater field with students.
- Distributed brochures and fliers to Devry University
- The city of Fremont Environmental Services Department funded Math/Science Nucleus (MSN) and city of Fremont Park and Recreation Department to develop and lead field trips to educate 140 students and 26 parents about urban runoff issues. The city also

funded Irvington Academy High School to educate students about urban runoff issues. (Fremont, 2003)

USD provided $25,897 worth of public education services, accounting for 51 percent of the cost in this category. USD provides a website with BMP fact sheets for citizens and business owners and participates in school outreach activities. The materials promote Integrated Pest Management and the Bay Area-wide campaign called Our Water/Our World. USD also provides brochures and facility inspection checklists for businesses such as restaurants and printer shops.

Contributions to the ACCWP totaled $50,796 and were for effectiveness evaluations, staff training, implementation assistance, educational outreach for organized activities and events, community stewardship grants, elementary education, environmental education at a fair, and staff labor.

Water Quality Monitoring

The total cost of this category was $131,326. Of this cost, $7,200 was for water quality sampling at two locations. Both chronic and acute toxicity tests were performed (Silva, pers. comm., 9/22/04).

Contributions to the ACCWP totaled $124,126 and were for regional state board annual fees, mercury testing, watershed inventory, data management, GIS assistance, fishery assessment, contract recreation, litter and leaf control, TMDL compliance tasks, diazinon grant, analytical services, a monitoring project, and staff labor.

Watershed Management

The total cost of this category was $17,610. All of the costs in this category represent contributions to the ACCWP for development of a watershed study framework, assessment of pilot project activities, and staff labor.

References

City of Fremont, 2003. "Alameda Countywide Clean Water Program Fiscal Year 2002/03 Annual Report". Volume III of IV.

Table C- 1. Fremont Cost Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Construction inspections by USD		New	17,715	Table C-4	100%	197	inspections[b]	Fremont, 2004b	89.93	$/inspection
Total			17,715		0.6%	of total stormwater cost				

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Assistance to eliminate non-stormwater discharges, analyze findings, reporting		New	5,081	Table C-5, Item 8.1	85.9%					
Staff labor (including overhead)		New	836	Table C-5, Item 8.2	14.1%					
Total			5,917		0.2%	of total stormwater cost				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Business inspection		New	160,861	Table C-4	76.6%	482	inspections	Silva, pers. comm. 9/22/04	333.74	$/inspection
Inspection documentation		New	31,697	Table C-4	15.1%					
Inspections, outreach activity, track findings, refine guidelines, training, reporting		New	16,694	Table C-5, Item 9.1	7.9%					
Staff labor (including overhead)		New	775	Table C-5, Item 9.2	0.4%					
Total			210,027		6.8%	of total stormwater cost				
Overall Cost Category Normalizations										
total category $ per inspection						482	inspections	Silva, pers. comm. 9/22/04	435.74	total $/inspection

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Labor for city stormwater staff		New	171,047	Table C-2, Items 1,2,3, and 4	37.7%					
Office supplies		New	558	Table C-2, item 7	0.1%					
Periodicals		New	469	Table C-2, item 8	0.1%					
Printing		New	1,688	Table C-2, item 9	0.4%					
Collection fee		New	11,777	Table C-2, Item 11	2.6%					
NPDES fee		New	8,750	Table C-2, Item 16	1.9%					
Telephone		New	13	Table C-2, item 19	0.0%					
Postage		New	75	Table C-2, item 20	0.0%					
Travel expenses		New	403	Table C-2, item 21	0.1%					
Training		New	840	Table C-2, item 22	0.2%					
Technical training		New	1,750	Table C-2, item 23	0.4%					
Office machines<$5k		New	350	Table C-2, item 28	0.1%					
Informational systems		New	19,375	Table C-2, Item 33	4.3%					
Worker's comp		New	590	Table C-2, item 34	0.1%					
General liability		New	3,058	Table C-2, item 35	0.7%					
Overhead allocation		New	110,737	Table C-2, Item 37	24.4%					
ACCWP participation		New	12,928	Table C-4	2.8%					
Reporting		New	7,659	Table C-4	1.7%					
Meeting		New	6,107	Table C-4	1.3%					
Mitigation		New	136	Table C-4	0.0%					
Regulatory advising, institute improvements, support committees, legal advice, website, and newsletter		New	32,372	Table C-5, Item 2.1	7.1%					

Table C – 1. Continued.

Dues for regional stormwater representation groups and tasks of regional benefit		New	10,887	Table C-5, Item 2.2	2.4%					
NPDES permit fee (ACCWP)		New	2,903	Table C-5, Item 2.3	0.6%					
Program contingency		New	10,670	Table C-5, Item 2.4	2.4%					
Contribution to support business-water quality incentives program		New	2,903	Table C-5, Item 2.5	0.6%					
Miscellaneous		New	5,081	Table C-5, Item 2.6	1.1%					
Staff labor for ACCWP (including overhead)		New	30,745	Table C-5, Item 2.8	6.8%					
Total			453,872		14.6%	of total stormwater cost				

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Street Sweeping Program						31,405	curb miles swept	Silva, pers. comm., 9/22/04	60.98	$/curb mile swept
Street sweeping		Enhanced	115,000	Table C-2, Item 30	5.4%					
Street sweeping		Enhanced	1,800,000	Table C-2, Item 31	84.6%					
Litter/debris removal		Existing	200,000	Table C-2, Item 32	9.4%					
Performance standard updating and development		New	12,339	Table C-5, Item 6.1	0.6%					
Staff labor (including overhead)		Enhanced	836	Table C-5, Item 6.2	0.0%					
Total			2,128,175		68.6%	of total stormwater cost				

Table C1 continued

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Quasi external expenditure		New	19,746	Table C-2, Item 36	56.3%					
Controls guidance, watershed inventory, consruction activities, performance standards, coordination		New	11,613	Table C-5, Item 7.1	33.1%					
Reprographic services (brochures)		New	2,177	Table C-5, Item 7.2	6.2%					
Staff labor (including overhead)		New	1,546	Table C-5, Item 7.3	4.4%					
Total			35,083		1.1%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Creek clean-up		New	5,200	Table C-2, Item 6	5.1%					
Advertising		New	310	Table C-2, Item 24	0.3%					
Storage space rental		New	210	Table C-2, Item 25	0.2%					
Math Science Nucleus (MSN) Environmental Education		New	6,803	Table C-3	6.7%					
Citywide newsletter		New	12,500	Table C-3	12.3%					
Public Education		New	25,897	Table C-4	25.5%					
Effectiveness evaluation, staff training, implemenation assistance		New	6,532	Table C-5, Item 5.2	6.4%					
Educational outreach for organized activities and events		New	4,355	Table C-5, Item 5.3	4.3%					
Community stewardship grants, implementation assistance		New	13,282	Table C-5, Item 5.4	13.1%					
Baysavers elementary education curriculum and implemenation		New	8,129	Table C-5, Item 5.5	8.0%					
Bay area environmental education resource fair		New	363	Table C-5, Item 5.6	0.4%					
General outreach		New	7,258	Table C-5, Item 5.7	7.1%					
Staff labor (including overhead)		New	10,876	Table C-5, Item 5.8	10.7%					
Total			101,717		3.3%	of total stormwater cost				

Table C – 1. Continued.

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Water quality sampling		New	7,200	Table C-3	5.5%					
Regional state board annual fee		New	20,323	Table C-5, Item 4.1	15.5%					
Murcury testing		New	9,436	Table C-5, Item 4.2	7.2%					
Watershed inventory, data management, and GIS asstistance		New	20,323	Table C-5, Item 4.3	15.5%					
Fishery assessment, contract recreation, litter and leaf control		New	18,871	Table C-5, Item 4.4	14.4%					
Contribution to TMDL compliance tasks		New	23,226	Table C-5, Item 4.5	17.7%					
Diazinon grant		New	1,452	Table C-5, Item 4.6	1.1%					
Analytical services		New	6,678	Table C-5, Item 4.7	5.1%					
Monitoring project		New	5,807	Table C-5, Item 4.8	4.4%					
Staff labor (inlcuding overhead)		New	18,011	Table C-5, Item 4.10	13.7%					
Total			131,326		4.2%	of total stormwater cost				

Watershed Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Development of watershed study framework, assessment of pilot project activities		New	9,435.65	Table C-5, Item 3.2	53.6%					
Staff labor (including overhead)		New	8,173.96	Table C-5, Item 3.4	46.4%					
Total			17,609.60		0.6%	of total stormwater cost				

Total Stormwater Costs 3,101,442

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.
b. Inspections for construction includes 58 erosion control inspections and 157 construction site inspections.

Table C-2. Source Data Table Submitted by City of Fremont (cost survey categories added)

Item #	City of Fremont Category	Total Cost	Cost Survey Category[1]
1	Salaries	115,954.72	Management
2	Benefits	37,413.57	Management
3	Overtime	928.78	Management
4	Part time salaries	16,750.10	Management
5	Promotional Materials	0.00	
6	Misc Operating Supplies	5,199.59	Public Education
7	Office Supplies	558.25	Management
8	Periodicals	469.06	Management
9	Printing	1,687.98	Management
10	Legal	0.00	
11	Consultant Services	11,777.40	Management
12	Contractual Services	26,503.39	See Table C-3
13	Photographic Services	0.00	
	Governmental Services[2]		
14	Union Sanitary District	263,000.00	See Table C-4
15	Alameda Countywide Clean Water Program	339,990.00	3 See Table C-5
16	State Water Resource Control Board	8,750.00	Management
	Media Purchase/Advertising		
18	Other Professional Services	0.00	
19	Telephone	12.96	Management
20	Postage	75.00	Management
21	Travel Expenses	403.43	Management
22	Training	840.29	Management
23	Technical Training	1,750.00	Management
24	Advertising development	310.00	Public Education
25	Space Rental	210.00	Public Education
26	Equipment Rental	0.00	
27	Office Machines > $5k	0.00	
28	Office Machines<$5k	350.00	Management
29	Office Furniture	0.00	
30	Interfund Transfers	115,000.00	Pollution Prevention
31	Interfund Transfers	1,800,000.00	Pollution Prevention
32	Interfund Transfers	200,000.00	Pollution Prevention
33	Info Systems	19,375.20	Management
	Transfer to Veh Repl Rund		
34	Worker's Comp	590.42	Management
35	General Liability	3,058.22	Management
36	Quasi-External Expenditure	19,746.31	Post Construction
37	Overhead Allocation	110,737.00	Management
	Total	3,101,441.67	

(Source: Silva, pers. comm., 4/5/04)

1. Cost Categories Abbreviated According to the Following:
Construction: Construction Site Stormwater Runoff Control

Table C-2. Continued.

Illicit Discharge: Illicit Discharge Detection and Elimination
Industrial: Industrial and Commercial Management Programs
Management: Overall Stormwater Program Management
Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
Post Construction: Post Construction Water Management in New Development and Redevelopment
Public Education: Public Education, Outreach, Involvement, and Participation
Monitoring: Water Quality Monitoring
Watershed: Watershed Management

2. The original total submitted for total governmental services was $611,417. This figure was changed per email from Barbara Silva on 6/10/04 to 611,750 as shown by the breakdown between Union Sanitary District, Alameda Countywide Clean Water Program, and State Water Resource Control Board.

3. This number was adjusted down from $340,000 upon reciept of contract breakdown (see Table C-5).

Table C-3. Breakdown of Contractual Services (Table C-2, Item 12)

Description	Cost	Cost Survey Category
Math Science Nucleus (MSN) Environmental Education	6,803	Public Education
Water quality sampling (Pacific Eco Risk)	7,200	Monitoring
Citywide newsletter	12,500	Public Education
Total	26,503	

(Source: Silva, pers. comm., 4/15/04)

Table C-4. Breakdown of Union Sanitation District (USD) Cost (Table C-2, Item 14)

Description	Cost	Cost Survey Category
Public education	25,897	Public Education
ACCWP participation	12,928	Management
Reporting	7,659	Management
Meeting	6,107	Management
Inspection documentation	31,697	Industrial
Mitigation	136	Management
Construction inspection	17,715	Construction
Business inspection	160,861	Industrial
	263,000	

(Source: Silva, pers. comm., 4/15/04)

Table C-5. ACCWP Cost Breakdown

GENERAL CLEAN WATER PROGRAM 2002-2003

Budget Unit 50201 **F15W81** **PROGRAM MANAGER: Jim Scanlin**

2. PLANNING AND REGULATORY COMPLIANCE

MAKE ENTRIES IN YELLOW BOXES

							GENERAL PROGRAM AMOUNT	% of Grand Total	Fremont Contribution
1	**EISENBERG OLIVIERI ASSOCIATES**	E01					$223,000	10%	32,372
	Regulatory Advising, Institute Improvements, Support Committees, Legal Advice, Website, and Newsletter								
2	**PARTICIPATION IN REGIONAL STORMWATER EFFORTS**	J11					$75,000	3%	10,887
	Dues for Regional Stormwater Representation Groups and tasks of regional benefit								
3	**NPDES PERMIT FEE**	J11					$20,000	1%	2,903
	Fee for Countywide Clean Water Program Permit - Required by Regional Water Board								
4	**CONTINGENCY**						$73,500	3%	10,670
	Program Contingency Amount								
5	**GREEN BAY BUSINESS PROGRAM**	J11					$20,000	1%	2,903
	Contribution to Support Business - Water Quality Incentives Program								
6	**SPECIAL DEPARTMENTAL ACCOUNT**						$35,000	1%	5,081
	Dan will tell us what this covers								
7	**CONTRACT**						$0	0%	0
	To fulfill Total Maximum Daily Load (TMDL) requirements								
8	**STAFF --**						$211,793	9%	30,745
	R. HALE	J01	300	85.00		$25,500			
	J. SCANLIN	J02	1,332	80.00		$106,560			
	G. SHAWLEY	J02	145	63.00		$9,135			
	LABOR OVERHEAD					$70,598			
						TOTAL PROGRAM ADMINISTRATION	**$658,293**	28%	95,560
		CLEAN WATER DIV. STAFF HRS.	1,777						

3. FOCUSED WATERSHED STUDIES

1	**CONTRACTOR TO BE DETERMINED**	E03					$0	0%	0
	Watershed Activities in Watersheds Tributary to Lake Merritt and Laguna Creek								
2	**APPLIED MARINE SCIENCES**	E03					$65,000	3%	9,436
	Develop Watershed Study Framework, Assess Pilot Project Activities								
3	**NAME OF CONTRACTOR**								
	Dexcription of service								
4	**STAFF**						$56,309	2%	8,174
	E. DA COSTA	J03	29	58.00		$1,682			
	A. FENG	J03	399	63.00		$25,137			
	J. SCANLIN	J03	134	80.00		$10,720			
	LABOR OVERHEAD					$18,770			
						TOTAL FOCUSED WATERSHED STUDIES	**$121,309**	5%	17,610
		HRS.	562						

4. WATER QUALITY MONITORING

								% of Grand Total	Fremont Contribution
1	**REGIONAL WATER BOARD FEE FOR REGIONAL MONITORING PROGRAM**	E04					$140,000	6%	20,323
	Annual Fee Required by Regional Water Board to Monitor and Report on Health (Water Quality) of San Francisco Bay Estuary								
2	**APPLIED MARINE SCIENCES (AMS)**	E04					$65,000	3%	9,436
	Mercury Testing								
3	**ENVIRONMENTAL IMPACT PLANNING CORP. (EIP)**	E04					$140,000	6%	20,323
	Watershed Inventory, Data Management, and Geographical Information Systems Assistance								
4	**URS CONSULTANTS**	E04					$130,000	6%	18,871
	Assess Fisheries, Contact Recreation, Litter and Leaf Control								
5	**REQUIRED CONTRIBUTION TO WATER QUALITY ATTAINMENT STRATEGIES**	E04					$160,000	7%	23,226
	Contribution to MOU-based Total Maximum Daily Load compliance tasks.								
6	**DIAZINON GRANT**	E04					$10,000	0%	1,452
	Diazinon Grant								
7	**SYSTECH ENGINEERING**						$46,000	2%	6,678
	Analytical Services								
8	**CLEAN WATER AGENCIES TMDL COPPER-NICKEL MONITORING PROJECT**						$40,000	2%	5,807
	Dexcription of service								
9	**NAME OF CONTRACTOR**								
	Dexcription of service								
10	**STAFF**						$124,077	5%	18,011
	E. DA COSTA	J04	20	58.00		$1,160			
	A. FENG	J04	956	63.00		$60,228			
	S. MILLER	J04	300	43.00		$12,900			
	TRAINEE	J04	40	26.00		$1,040			
	J. SCANLIN	J04	53	80.00		$4,240			
	G. SHAWLEY	J04	50	63.00		$3,150			
	LABOR OVERHEAD					$41,359			
						TOTAL WATER QUALITY MONITORING	**$855,077**	37%	124,126
		HRS.	1,419						

5. PUBLIC INFORMATION/PARTICIPATION

			GENERAL PROGRAM AMOUNT	% of Grand Total	Fremont Contribution
1	**TARGETED OUTREACH / REGIONAL ADVERTISING**	E05	$0	0%	0
	Targeted Outreach to Meet Public Information Requirements - REGIONAL ADVERTISING				
2	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E05	$45,000	2%	6,532
	Evaluate Effectiveness, Clean Water City and County Staff Training, Assist Implementation				

Table C-5. Continued.

3	**ESTUARY ACTION CHALLENGE**	E05					$30,000	1%	4,355
	Educational Outreach for Organized Activities and Events								
4	**AQUATIC OUTREACH INST. (AOI) Kids in Creeks**	E05					$91,500	4%	13,282
	Community Stewardship Grants, Educ.Outreach (Kids in Creeks, Gardens, Marshes & Workshops) Assist Implementation								
5	**RESOURCE CONSERVATION DIST. (RCD) - Baysavers**	E05					$56,000	2%	8,129
	Educational Support - Baysavers Elementary Education Curriculum and Implementation								
6	**BAY AREA ENVIRONMENTAL EDUCATION RESOURCE FAIR (BAEER FAIR)**	E05					$2,500	0%	363
	Educational Support								
7	**CONTRACTOR TO BE DETERM. GEN'L OUTREACH**						$50,000	2%	7,258
	Reinforce Message in Communities								
8	**STAFF**						$74,925	3%	10,876
	L. CERVANTES	J05	850	53.00		$45,050			
	S. GOSSELIN	J05	70	70.00		$4,900			
	LABOR OVERHEAD					$24,975			
					TOTAL PUBLIC INFORMATION / PARTICIPATION		**$349,925**	15%	50,796
		HRS.	920						

6. MUNICIPAL MAINTENANCE PRACTICES

								% of Grand Total	Fremont Contribution
1	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E06					$85,000	4%	12,339
	Update and Develop Perform. Stds, Coordinate Maint Actvties, ID Struct Controls, Maint. Data Mgmt, Maint. Outreach, Maint Component Mgmt.								
2	**STAFF**						$5,760	0%	836
	J. SCANLIN	J06	48	80.00		$3,840			
	LABOR OVERHEAD					$1,920			
					TOTAL MUNICIPAL MAINTENANCE		**$90,760**	4%	13,175
		HRS.	48						

7. NEW DEVELOPMENT AND CONSTRUCTION SITE CONTROLS

1	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E07					$80,000	3%	11,613
	Guidance on Stormwtr Controls, Constr. Actvties, Outreach, Perf. Stds. Wshed Inventry, Coord. w/ District, Component Mgmt.								
2	**REPROGRAPHIC SVCS. ALCOLINK (Brochures)**						$15,000	1%	2,177
	Dexcription of service								
3	**STAFF**						$10,650	0%	1,546
	D. BACH	J07	100	47.00		$4,700			
	J. SCANLIN	J07	30	80.00		$2,400			
	LABOR OVERHEAD					$3,550			
					TOTAL NEW DEVELOPMENT AND CONSTRUCTION SITE CONTROLS		**$105,650**	5%	15,337
		HRS.	130						

8. ILLICIT DISCHARGE CONTROLS

1	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E08					$35,000	1%	5,081
	Assist to Eliminate Non-Stormwater Discharges, Analyze Illicit Discharge Findings, Share Information on Non-Stormwater Discharges, Illicit Discharge Reporting								
2	**STAFF**						$5,760	0%	836
	J. SCANLIN	J08	48	80.00		$3,840			
	LABOR OVERHEAD					$1,920			
					TOTAL ILLICIT DISCHARGE CONTROLS		**$40,760**	2%	5,917
		HRS.	48						

9. INDUSTRIAL INSPECTION PROGRAM

1	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E09					$115,000	5%	16,694
	Conduct Insp & Outreach Activtes, Track Findings, Share Info on Facilites, Refine Indus BMP Guidelilnes, Insp Training, Insp Reporting								
2	**STAFF**						$5,340	0%	775
	J. SCANLIN	J09	45	80.00		$3,560			
	LABOR OVERHEAD					$1,780			
					TOTAL INDUSTRIAL INSPECTION PROGRAM		**$120,340**	5%	17,469
		CLEAN WATER DIV. STAFF HRS.	45						

	TOTAL GENERAL PROGRAM	**$2,342,113**	100% 339,990

MAKE ENTRIES IN YELLOW SHADED CELLS ONLY

To change revision date, go to tab entitled ALTERNATIVES - STAFFING & COSTS

REVISION: 2/3/02

STAFF	HRS	AMOUNT
D. Bach	100	$4,700
L. Cervantes	850	$45,050
E. da Costa	49	$2,842
A. Feng	1,355	$85,365
S. Gosselin	70	$4,900
R. Hale	300	$25,500
S. Miller	300	$12,900
J. Scanlin	1,690	$135,160
G. Shawley	195	$12,285
Trainee	40	$1,040
TOTAL HOURS	4,949	
TOTAL BURDENED LABOR		$329,742
TOTAL STAFF with overhead		**$494,613**

FUNDING

AVAILABLE FUND BALANCE

$242,113 (for current fiscal year)

	CONTRIBUTIONS	PROPORTION	
5083	$83,580	0.03980	ALAMEDA
5084	$21,000	0.01000	ALBANY
5085	$107,310	0.05110	BERKELEY
5086	$49,350	0.02350	DUBLIN
5087	$21,000	0.01000	EMERYVILLE
5088	$339,990	0.16190	FREMONT
5089	$235,410	0.11210	HAYWARD
5090	$123,270	0.05870	LIVERMORE
5091	$57,750	0.02750	NEWARK
5092	$462,420	0.22020	OAKLAND
5093	$21,000	0.01000	PIEDMONT
5094	$114,030	0.05430	PLEASANTON
5096	$104,160	0.04960	SAN LEANDRO
5097	$104,790	0.04990	UNION CITY
5082	$254,940	0.12140	UNINCORPORATED AREA (from F15W82 spread)
TOTAL CONTRIBUTIONS	$2,100,000	1.00000	**TOTAL SHARES**
TOTAL FUNDING	**$2,342,113**		

PROGRAM DETAILS:

STAFF WITH OVERHEAD	$494,613
SPECIALIZED SERVICES	$1,752,500
OTHER EXPENSES (fees, etc.):	$95,000
PROGRAM TOTAL:	**$2,342,113**

DETAIL:	MULTI-TASK CONSULTANTS
EOA TOTAL	$583,000
AMS TOTAL	$130,000

(Source: Hale, pers. comm., 7/15/04)

Appendix D Fresno-Clovis Metropolitan Area

This appendix contains backup calculations for each cost survey category in Section 6 and the sources of the cost data. The Fresno-Clovis Metropolitan Area (FCMA) covers the area served by the Fresno Metropolitan Flood Control District (FMFCD). Stormwater permittees in this area include the County of Fresno, city of Fresno, city of Clovis, and the California State University at Fresno (CSUF). The FMFCD was the lead agency for communication on this project. Figure D-1 illustrates how data is shared throughout the tables.

Table D-1 contains all costs from all copermittees organized into the cost survey categories and the remaining tables provide backup to the numbers in Table D-1. The relationship of these tables is described below and presented in figure D-1. Table D-2 contains FMFCD cost organized by survey category but with added detail than what is provided in Table D-1. The cost figures in Table D-2 were summarized from the FMFCD accounting system cost summary (Table D-7).

Table D-3 summarizes the costs for the city of Clovis, Fresno County, city of Fresno, and CSUF respectively. These costs include budgeted costs and actual street sweeping costs, which are subtotaled for each cost survey category.

Table D-4 presents the allocation of city staff labor cost to the stormwater program. Table D-5 presents street sweeping data while Table D-6 presents a recreated portion of an FMFCD financial statement which was used for comparison to stormwater costs submitted by city staff.

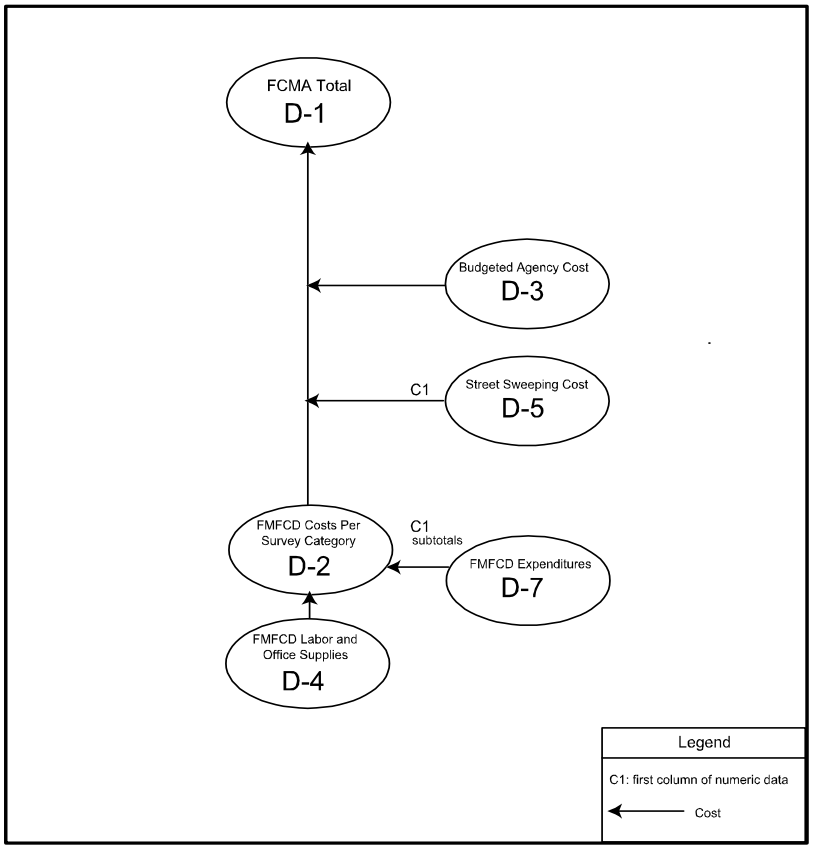

Figure D-1. Fresno-Clovis Metropolitan Area Flowchart

Other Agency Breakdown

Table D-3 contains the budgeted costs contained in the SWQMP report (FMFCD, 1999). These costs are subtotaled for each cost survey category and the subtotals are brought forward to Table D-1. Except for the FMFCD, which submitted actual costs, the costs were taken from the 00/01 budget for the other agencies as presented in the SWMP published in 1999 (FMFCD, 1999). The 00/01 year was used because the implementation of the program under the new permit was delayed for two years. The SWMP assumed the permit would be adopted in 1999 and the first fiscal year of the new program would be 99/00. The permit was not adopted until 2001 and the first fiscal year implementing the new stormwater permit was 00/01. In 02/03, the program only had one year of development. Thus, the second year costs were taken from the SWMP to represent 02/03 costs on the advice of FMFCD staff. Table D-3 includes a 'baseline' cost element. This is for the staff labor of the programs as they already existed at the start of the new permit (Rourke, pers. comm., 6/25/04). Table D-3 also contains an added line item for actual street sweeping costs pulled forward from Table D-5.

Table D-5 contains the street sweeping data collected for the FCMA. Table D-9 also calculates street sweeping cost per mile and estimated sweeping frequency. It should be noted that the estimated frequency for the city of Clovis is nearly four times a week for all streets. This seemed high and it could not be verified with the city. The cost per mile was relatively low ($13), which indicates the costs may be accurate and only the total miles swept is in question.

Notes on Labor Cost

For the FMFCD, the labor costs of the stormwater staff is not distributed among the various programs. Instead, it is all captured under Overall Stormwater Program Management. However, the labor costs from the other agencies within the FMFCD were able to distribute their labor among various programs. This should be considered when comparing costs to other municipalities where such costs are distributed.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

The reason we allocate FMFCD cost, but not other overall program costs for other cities is because the services provided by outside agencies (e.g. ACCWP to Fremont) are paid for by Fremont. FMFCD gets funds for stormwater directly from households "user fees", "utility bills". If FMFCD did not provide this "free" service, the cities would have to pay for them.

For agencies other than FMFCD, external contracting was not determined for each cost. It is only presented in the text of this appendix on a case-by-case basis. For FMFCD this information is presented in Table D-2.

Construction Site Stormwater Runoff Control

The total cost of this category was $81,800. The costs allocated for this category were only from the city of Clovis (Table D-2), county of Fresno (Table D-3), and the city of Fresno (Table D-4). No statistics were available that described the activity except for the city of Clovis. Clovis conducted 713 inspections at a cost of $29,600, which averages to $42 per inspection. The primary activities performed by each agency were plan reviews, site inspections, enforcement, and employee training. Other activities performed were as follows (source: annual stormwater report, FMFCD, 2003b):

- Identified 163 private detention basins and mailed pond maintenance and vector control fact sheets to pond owners
- Conducted 9 stormwater training workshops and safety tailgate sessions for general contractors, construction site superintendents, field inspectors, plan designers, and municipal regulators
- Increased construction sire inspections and follow-up inspection referrals to the District
- Reviewed construction site guidelines
- Sent out an "Action Alert" notifying area construction sites and companies of new Phase II regulations and schedules
- Included new regulations in training courses and site visits
- Modified the SWPPP to include sampling and analysis guidance
- The District conducted 48 inspections at 15 construction sites

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $13,176. This cost was for investigation, inspection and enforcement. The costs for the FMFCD, county of Fresno, the city of Clovis, and the city of Fresno accounted for two percent, eight percent, eighty-two percent, and eight percent of the IDDE costs, respectively. Activities in this category included the following (source: annual stormwater report, FMFCD, 2003b):

- Field inspectors were trained to identify and report illegal disposals
- Fifty thousand paint sticks were distributed at 17 paint retailers throughout the permit area
- Recharged irrigation waters and nuisance flows
- Participated in Water Awareness Committee and P2 Committee
- Reviewed and revised referral procedures between the District and Copermittees
- Conducted inspector training via workshops and tailgates
- Conducted firefighter training

- The County sponsored the California Conservation Corp to stencil 527 storm drain inlets in Clovis
- Students stenciled 73 storm drain inlets in the city of Clovis
- The District conducted 71 complaint inspections in response to citizen or Copermittee referrals
- The Clovis Fire Department responded to 82 hazardous waste spills
- The District developed and aired water conservation theater advertisement slides at two major movie theaters with over 30 screens and sent out 23,000 utility bill inserts to Clovis households in their monthly water bill
- The city of Clovis sent out notices to 22,360 customers reminding them of the outdoor watering rules and what they can to reduce runoff
- In Fresno County, the emergency response team program documented over 289 units of filed activity involving hazardous waste, which included complaints and follow-up enforcement inspections

Industrial and Commercial Management Programs

The cost for this category was $47,480. FMFCD activities include the purchase of phone complaint forms employee training of the other agencies. Other activities in this category included (source: annual stormwater report, FMFCD, 2003b):

- Held industrial training workshops
- Distributed over 65 model SWPPPs
- Coordinated with County Hazardous Waste and Fresno Industrial Waste inspectors to review inspection and referral procedures
- Conducted audits of 5 Copermittee corporation yards
- The District conducted 14 complaint-driven commercial and industrial inspections and 42 routine industrial inspections at NPDES permitted facilities

Overall Stormwater Program Management

The total cost of this category was $560,495. FMFCD accounted for approximately 98 percent of this category's cost. Most of this was labor cost (see Table D-7 for details). The other costs for this category were attributable to the following activities:

- Travel
- Meetings and conferences
- Dues and fees
- Food
- Printing

- Office supplies
- SWRCB fees
- Handbooks

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost for this category was $2,240,605. Clovis accounted for 28% and the city of Fresno accounted for 70% due primarily to street sweeping costs (Table D-9).

Other agency costs were for road maintenance, street cleaning, corporation yard guidance, and staff labor.

Other specific activities attributed to this category included (source: annual stormwater report, FMFCD, 2003b):

- Completed digitizing the District's stormwater conveyance system into the District's GIS system
- Developed, organized, and facilitated stormwater pollution prevention training courses for parks and open space maintenance personnel
- The District removed accumulated sediments from their retention basins
- Training of employees

Post Construction Stormwater Management in New Development and Redevelopment

The total cost of this category was $57,539. Most of the cost for this category was for the detention and retention basin operation and maintenance funded by FMFCD. The following detention and retention maintenance activities were performed:

- Cleaned 35 basins
- Rodent control
- Tree care
- Sediment removal and disposal
- Equipment rental
- Vegetation removal and recycling
- Vaccum truck cleaning
- Reviewed monitoring studies
- Completed standards research
- The District incorporated post construction standards in its Code of Requirements
- Soil monitoring

- Fence repair

The other agencies had no cost attributable to this category.

Public Education and Outreach and *Public Involvement and Participation*

The total cost of this category was $210,716. Most of the $208,016 paid by FMFCD was for professional services, newspaper advertisements, utility bill inserts, and other miscellaneous costs. The other agency costs were for school education, staff labor, and coordination with other programs. Other activities performed were (source: annual stormwater report, FMFCD, 2003b):

- Developed and aired three new Public Service Announcements (English and Spanish) targeting pollution prevention and water awareness
- Completed seven Clean Storm Water Grants to community organizations focused on stormwater education
- Continued implementation of a community wide integrated pest management program
- Conducted numerous presentations to community groups and school programs
- Produced a new brochure
- Participated in the local Pollution Prevention Committee
- Provided training for local inspectors
- The District maintained active membership with WERF, participated with the National Association of Flood and Storm Water Managers Association, provided $10,000 to WERF for stormwater research initiatives, and provided comments to EPA though the Storm Water Quality Task Force
- Participated in 18 community and public education events
- Provided a public education display illustrating ways to manage solid waste to incorporated cities throughout the County
- Conducted tours of the American Avenue Landfill for fourth grade to college level students
- Developed training manuals, theater slides, bus signage, pond maintenance fact sheets, mosquito abatement, control, and home owner fact sheets to promote BMPs and the SWQMP program
- Updated public education and technical assistance outreach materials
- Developed and implemented IPM Point of Purchase program
- Awarded 20 grants totaling $20,000
- Provided teacher workshops

Water Quality Monitoring

The total cost of this category was $252,918. The costs were for the FMFCD for the following activities:

- Monitoring
- Consulting
- Phone usage
- Communications
- WERF subscription

The other agencies had no cost attributable to this category.

References

FMFCD. 2003. "Annual Report FY 2002-2003, Fresno-Clovis Storm Water Quality Management Program" Volume 1: Program Evaluations.

Table D-1. Fresno-Clovis Metropolitan Area Costs Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	Relation to Permit[a]	Dollar Amount	Source	% of Category
FMFCD		0	N/A	0.0%
City of Clovis	New	29,600	Table D-3	36.2%
County of Fresno	New	6,900	Table D-3	8.4%
City of Fresno	New	45,300	Table D-3	55.4%
CSUF		0	N/A	0.0%
Total		81,800		2.4% *

Illicit Discharge Detection and Elimination

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	76	Table D-2	0.6%
City of Clovis	New	10,100	Table D-3	76.7%
County of Fresno	New	1,000	Table D-3	7.6%
City of Fresno	New	1,000	Table D-3	7.6%
CSUF	New	1,000	Table D-3	7.6%
Total		13,176		0.4% *

Industrial and Commercial Management Programs

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	22,180	Table D-2	46.4%
City of Clovis	New	6,100	Table D-3	12.8%
County of Fresno	New	8,200	Table D-3	17.2%
City of Fresno	New	10,400	Table D-3	21.8%
CSUF	New	900	Table D-3	1.9%
Total		47,780		1.4% *

Overall Stormwater Program Management

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	560,895	Table D-2	98.3%
City of Clovis	New	1,600	Table D-3	0.3%
County of Fresno	New	3,200	Table D-3	0.6%
City of Fresno	New	3,200	Table D-3	0.6%
CSUF	New	1,600	Table D-3	0.3%
Total		570,495		16.4% *

Table D-1. Continued.

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	29,409	Table D-2	1.3%
City of Clovis	Enhanced	631,696	Table D-3	28.2%
County of Fresno	Enhanced	5,300	Table D-3	0.2%
City of Fresno	Enhanced	1,572,500	Table D-3	70.2%
CSUF	Enhanced	1,700	Table D-3	0.1%
Total		2,240,605		64.5% *

Post Construction Stormwater Management in New Development and Redevelopment

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	Existing	57,539	Table D-2	100.0%
City of Clovis		0	N/A	0.0%
County of Fresno		0	N/A	0.0%
City of Fresno		0	N/A	0.0%
CSUF		0	N/A	0.0%
Total		57,539		1.7% *

Public Education, Outreach, Involvement, and Participation

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	208,016	Table D-2	98.7%
City of Clovis	New	200	Table D-3	0.1%
County of Fresno	New	2,500	Table D-3	1.2%
City of Fresno		0	N/A	0.0%
CSUF		0	N/A	0.0%
Total		210,716		6.1% *

Water Quality Monitoring

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	252,918	Table D-2	100.0%
City of Clovis		0	N/A	0.0%
County of Fresno		0	N/A	0.0%
City of Fresno		0	N/A	0.0%
CSUF		0	N/A	0.0%
Total		252,918		7.3% *

Total Stormwater Cost **3,475,029**

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

* This percentage is calculated by dividing the total "cost survey category" cost by the "total stormwater cost".

Table D-2. FMFCD Costs Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
			0							
Total			0			of total FMFCD stormwater program costs				

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Investigation, Inspection, Enforcement		New	76	Table D-7, Item 39	100%					
Total			76		0.0%	of total FMFCD stormwater program costs				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Phone complaints		New	333	Table D-7, Item 58	1.5%					
Geosyntec services	x	New	21,791	Table D-7, Items 15 & 16	98.2%					
Miscellaneous		New	56	Table D-7, Item 17	0.3%					
Total			22,180		2.0%	of total FMFCD stormwater program costs				

Table D-1 continued

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Travel		New	2,382	Table D-7, Items 10 & 50	0.4%					
Meetings and conferences		New	1,508	Table D-7, Items 11& 51	0.3%					
Dues and fees		New	10,000	Table D-7, Item 12	1.8%					
Training		New	1,261	Table D-7, Items 13 & 53	0.2%					
Miscellaneous expenses		New	7,519	Table D-7, Items 14 & 56	1.3%					
Food		New	341	Table D-7, Item 45	0.1%					
Printing		New	622	Table D-7, Item 47	0.1%					
Office supplies		New	172	Table D-7, Item 48	0.0%					
SWRCB fees		New	17,750	Table D-7, Item 49	3.2%					
Handbooks		New	66	Table D-7, Item 54	0.0%					
Program expenses		New	112	Table D-7, Item 57	0.0%					
Personnel expenses		New	498,300	Table D-4	88.8%					
Office administration		New	20,864	Table D-4	3.7%					
Total			560,895		49.6%	of total FMFCD stormwater program costs				

Table D-2. Continued.

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
BMP Hanbook Update		New	10,000	Table D-7, Item 2	34.0%					
Geosyntec services	x	New	1,996	Table D-7, Item 3	6.8%					
Truck cleaning		New	15,749	Table D-7, Items 33 & 35	53.6%					
Utility expense		New	1,007	Table D-7, Item 36	3.4%					
Fresno Pipeline		New	657	Table D-7, Item 34	2.2%					
Total			29,409		2.6%	of total FMFCD stormwater program costs				

Table D-7 continued

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Basin maintenance		Existing	8,174	Table D-7, Item 19	14.2%	8	basins	FMFCD, 2003b	7,192.34	category $/basin
Wild agreement	x	Existing	2,460	Table D-7, Item 20	4.3%					
Rodent control		Existing	1,380	Table D-7, Item 21	2.4%					
Tree care		Existing	290	Table D-7, Item 22	0.5%					
Spruce Ave		Existing	3,439	Table D-7, Item 23	6.0%					
Miscellaneous expenses		Existing	2,237	Table D-7, Item 24	3.9%					
Fuel expense		Existing	1,230	Table D-7, Item 25	2.1%					
Matt and sons agreement	x	Existing	16,989	Table D-7, Item 26	29.5%					
Equipment rental		Existing	433	Table D-7, Item 27	0.8%					
Greenwaste		Existing	2,365	Table D-7, Item 28	4.1%					
Vaccum truck cleaning		Existing	1,015	Table D-7, Item 29	1.8%					
Matt and sons	x	Existing	2,129	Table D-7, Item 30	3.7%					
Cerutti agreement	x	Existing	1,825	Table D-7, Item 31	3.2%					
Emmetts agreement	x	Existing	2,560	Table D-7, Item 32	4.4%					
Fence repair		Existing	584	Table D-7, Item 37	1.0%					
Soil monitoring		Existing	10,428	Table D-7, Item 38	18.1%					
Total			57,539		5.1%	of total FMFCD stormwater program costs				

Table D-2. Continued.

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Panagraph Inc.	x	New	47,008	Table D-7, Item 7	22.6%					
Panagraph services	x	New	39,177	Table D-7, Item 8	18.8%					
Miscellaneous expenses		New	96,690	Table D-7, Items 9, 18, & 46	46.5%					
Utility bill inserts		New	2,525	Table D-7, Item 55	1.2%					
Newspaper description		New	15,095	Table D-7, Item 59	7.3%					
Grant		New	7,521	Table D-7, Item 52	3.6%					
Total			208,016		18.4%	of total stormwater cost				

Table D-1 continued

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Geosyntec monitoring	x	New	44,334	Table D-7, Item 1	17.5%					
Sheit, Handon and Hall	x	New	298	Table D-7, Item 4	0.1%					
LWA monitoring	x	New	156,663	Table D-7, Items 5 & 40	61.9%					
LWA services	x	New	40,258	Table D-7, Items 6 & 43	15.9%					
Phone expense		New	282	Table D-7, Item 41	0.1%					
Communication expense		New	1,083	Table D-7, Item 42	0.4%					
WERF		New	10,000	Table D-7, Item 44	4.0%					
Total			252,918		22.4%	of total FMFCD stormwater program costs				

Total FMFCD Stormwater Cost **1,131,033**

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

Table D-3. Summary of Budgeted Stormwater Costs for Fresno Agencies

Item #	Program	Description	City of Clovis	County of Fresno	City of Fresno	CSUF
	Public Involvement and Education	Coordinate with other programs	0	400	0	0
	Public Involvement and Education	Maintain and promote school education	200	0	0	0
	Public Involvement and Education	Baseline costs	0	2,100	0	0
1	**Subtotal**		**200**	**2,500**	**0**	**0**
	Illicit Discharge	Implement inspector training	3,200	0	0	0
	Illicit Discharge	Train response personnel	3,200	0	0	0
	Illicit Discharge	Baseline costs	3,700	1,000	1,000	1,000
2	**Subtotal**		**10,100**	**1,000**	**1,000**	**1,000**
	Operations and Maintenance	Implement guidance for road maintenance activities	700	0	0	0
	Operations and Maintenance	Implement street cleaning practices (see 'Actual' costs)	100	0	0	0
	Operations and Maintenance	Implement corporation yard operation guidance	2,500	0	0	0
	Operations and Maintenance	Baseline costs	3,300	5,300	4,300	1,700
	Operations and Maintenance	*Actual street sweeping cost*	625,096	0	1,568,200	0
3	**Subtotal**		**631,696**	**5,300**	**1,572,500**	**1,700**
	Construction and Development	Review plans, inspect sites, enforce control requirement	19,100	2,600	13,700	0
	Construction and Development	Train agency personnel and development community	100	1,100	10,500	0
	Construction and Development	Baseline costs	10,100	3,200	19,000	0
	Construction and Development	Consider standard requirements	300	0	0	0
	Construction and Development	Implement construction site guidelines	0	0	2,100	0
4	**Subtotal**		**29,600**	**6,900**	**45,300**	**0**
	Commercial and Industrial	Implement inspection and enforcement procedures	0	100	0	0
	Commercial and Industrial	Train employees	1,600	100	0	0
	Commercial and Industrial	Baseline costs	4,500	8,000	10,400	900
5	**Subtotal**		**6,100**	**8,200**	**10,400**	**900**
6	***Overall Stormwater Program Man.*** [1]	Administration and management	**1,600**	**3,200**	**3,200**	**1,600**
	Total		**679,296**	**27,100**	**1,632,400**	**5,200**

Source: Fresno-Clovis Storm Water Quality Management Program, 00/01 budget (Fresno, 1999)

1. The program title was assigned and did not come from the reference.

Table D-4. Calculation of Labor and Office Supply Costs for Stormwater

CAFR Description	Amount	Allocation to Stormwater	Reference	Stormwater Cost
Personnel expense[1]	$4,529,998	11%	Palmoville, pers. comm., 6/10/04	$ 498,299.78
Office Administration[1]	$189,671	11%	Palmoville, pers. comm., 6/10/04	$ 20,863.81

1. From page 20 of FMFCD CAFR, Statement of Revenues, Expenditures and Changes in Fund Balance - Government Funds and Reconcilliation to the Statement of Activities

Table D-5. Street Sweeping Data Submitted by City Staff and Normalization

Entity	Cost[1]	Curb Miles Swept[2]	Cost Per Mile Swept	Approximate City Street Miles
City of Fresno	1,568,200	94,495	16.60	
City of Clovis	625,096	47,430	13.18	235
CSUF	N/A	465	N/A	
County of Fresno	N/A	21	N/A	
Total	2,193,296	142,411	15.40	

1. (Source: Rourke, pers. comm., 8/02/04)
2. (Source: FMFCD, 2003b)

Table D-6. Recreated Portion of FMFCD Financial Statement

Fresno Metropolitan Flood Control District
Statement of Activities
for the year ended June 30, 2003

Functions/Programs	Expenses
General government	$6,388,084
Flood control system	4,010,377
Storm water quality	611,870
Interest on long-term debt	1,010,490
Total	12,020,821

(Source: FMFCD, 2003a.)

Table D-7. Source Data Table Submitted by FMFCD (cost survey categories added)

FMFCD Category	Item Number	DESC	APDesc	GL_Amt	Cost Survey Category[1]
Municipal NPDES Program Development 7030-7036					
		Consulting Services			
	1	GeoSyntec Consultants	2001-2002 SWQM	4,575.17	Monitoring
	1	GeoSyntec Consultants	2001-2002 Stormwater Quality M	952.22	Monitoring
	2	San Bernardino County	Updated Best Mgmt Practice Han	10,000.00	Pollution Prevention
	3	GeoSyntec Consultants	Service through 12/03/2002	683.78	Pollution Prevention
	3	GeoSyntec Consultants Inc	Service thru 01/07/2003	230.94	Pollution Prevention
	1	GeoSyntec Consultants Inc	03/2003 SWQ Monitoring	7,029.84	Monitoring
	1	GeoSyntec Consultants Inc	03/2003 SWQ Monitoring	2,343.45	Monitoring
	3	GeoSyntec Consultants Inc	05/2002 Communication Fee	0.30	Pollution Prevention
	1	GeoSyntec Consultants Inc	4/2003 Storm Water Monitoring	8,262.75	Monitoring
	1	GeoSyntec Consultants Inc	02-03 Storm Water Monitoring	7,302.26	Monitoring
	1	GeoSyntec Consultants Inc	02-03 Stormwater Quality Monit	4,867.72	Monitoring
	3	GeoSyntec Consultants Inc	Service thru 06/30/03	1,081.33	Pollution Prevention
	1	GeoSyntec Consultants Inc	02-03 Stormwater Monitoring	9,000.47	Monitoring
	Item Number		**Total Consulting Services**	**56,330.23**	
Subtotals	1		GeoSWQM7031	44,333.88	Monitoring
	2		SanBMPHan7031	10,000.00	Pollution Prevention
	3		GeoService7031	1,996.35	Pollution Prevention
			Total	56,330.23	
			Difference	0.00	
		Monitoring			
	4	Scheidt Haydon & Hall	SWQM BM02-01 6/26/02-7/02/02 W	298.06	Monitoring
	5	Larry Walker Associates Inc	Storm Water Quality Monitoring	3,530.00	Monitoring
	5	Larry Walker Associates Inc	2001-2002 Stormwater Monitorin	1,680.00	Monitoring
	5	Larry Walker Associates Inc	2001-2002 Stormwater Monitorin	1,680.00	Monitoring
	6	Larry Walker Associates Inc	09/01/02-09/18/02 Professional	173.25	Monitoring
	5	Larry Walker Associates Inc	2002-2003 SWQ Monitoring	132.00	Monitoring
	5	Larry Walker Associates Inc	02-03 Stormwater Quality Monit	2,262.50	Monitoring
	5	Larry Walker Associates Inc	02-03 Stormwater Monitoring	3,515.00	Monitoring
	Item Number		**Total Monitoring**	**13,270.81**	
Subtotals	4		SHHSWQM7033	298.06	Monitoring
	5		LWASWQM7033	12,799.50	Monitoring
	6		LWAProf7033	173.25	Monitoring
			Total	13,270.81	
			Difference	0.00	
		Public Information			
	9	Bank of America	Horizon	25.28	Public Education
	7	Panagraph Inc	07/2002 SWQMP Public Informati	3,831.50	Public Education
	9	Reed & Graham Inc	Bags of Gravel	42.83	Public Education
	7	Panagraph Inc	2002-2003 SWQMP Public Info &	1,636.25	Public Education
	7	Panagraph Inc	2001-2002 SWQMP Public Info &	8,227.38	Public Education
	7	Panagraph Inc	2002-2003 SWQMP Education	5,100.00	Public Education
	7	Panagraph Inc	2001-2002 SWQMP Education	1,713.50	Public Education
	7	Panagraph Inc	10/2002 SWQMP Public Info	4,250.00	Public Education
	9	Bank of America	Water Education Foundation	218.43	Public Education
	8	Panagraph Inc	Service through 10/31/2002	2,677.50	Public Education
	8	Panagraph Inc	Service thru 01/2003	3,271.54	Public Education
	8	Panagraph Inc	Services thru 12/2002	4,160.33	Public Education
	7	Panagraph Inc	2002-2003 SWQMP	5,876.97	Public Education
	8	Panagraph Inc	Services thru 03/2003	9,220.35	Public Education
	7	Panagraph Inc	SWQMP Public Info & Education	16,372.78	Public Education
	8	Panagraph Inc	02-03 Public Info & Education	15,036.32	Public Education
	8	Panagraph Inc	06/2003 Services SWQMP Info	4,810.73	Public Education
	Item Number		**Total Public Information**	**86,471.69**	
Subtotals	7		PanSWQMP7034	47,008.38	Public Education
	8		PanServices7034	39,176.77	Public Education
	9		Misc7034	286.54	Public Education
			Total	86,471.69	
			Difference	0.00	

Table D-7. Continued.

		General Expenses			
	10	Bank of America	Hyatt Regency	180.00	Management
	10	Bank of America	Hertz	93.13	Management
	10	Bank of America	City of Fresno Airport	6.00	Management
	10	David J Pomaville	Travel Reimbursement	5.32	Management
	10	Bank of America	Host Airport Hotel	124.75	Management
	10	Bank of America	Hertz	155.50	Management
	10	Bank of America	City of Fresno Parking	12.00	Management
	10	David J Pomaville	Travel Reimbursement	4.00	Management
	10	Doug Harrison	Travel Reimbursement	32.79	Management
	10	Doug Harrison	Travel Reimbursement	40.00	Management
	10	IMPAC Government Services	Radisson Hotel Sacramento	58.96	Management
	14	IMPAC Government Services	Maguire's Chevron	4.75	Management
	10	IMPAC Government Services	Hertz	81.30	Management
	14	IMPAC Government Services	Flag City	9.55	Management
	11	Calif Stormwater Quality Tas	SWQTF September Meeting Fee	40.00	Management
	10	Bank of America	Doubletree Hotel	108.31	Management
	10	Bank of America	City of Fresno Airport Parking	16.00	Management
	10	Bank of America	The Broiler Restaurant	31.37	Management
	10	Bank of America	Hertz Rent A Car	75.60	Management
	10	David J Pomaville	Reimbursement for Parking	7.00	Management
	11	Groundwater Resources Assoc	Nitrate in Groundwater Conf Re	150.00	Management
	12	SWQTF	2002/2003 Annual Dues	10,000.00	Management
	11	Beck & Duke Travel Service	SWQTF Conference-Ontario	526.00	Management
	10	Bank of America	Holiday Inn on the Bay	109.40	Management
	10	Bank of America	Hertz Rent a Car	63.00	Management
	11	California Storm Water Quali	CASQA Annual Board Meeting	40.00	Management
	10	Bank of America	Oakland Intl Airport Parking	12.00	Management
	10	Bank of America	City of Fresno Airport Parking	8.00	Management
	10	Bank of America	Hertz Rental Car	87.02	Management
	11	Beck & Duke Travel Service	Storm Water Quality Conf San D	374.00	Management
	10	David J Pomaville	Reimbursement Circle K Fuel	12.33	Management
	10	Bank of America	Anthony's Fish Grotto-San Dieg	22.88	Management
	10	Bank of America	Holiday Inn on the Bay	244.88	Management
	10	David J Pomaville	Meal Reimb-Cafe Care Ole'	5.00	Management
	10	David J Pomaville	Meal Reimbursement	15.00	Management
	10	David J Pomaville	Orange Cab-San Diego	12.00	Management
	10	Bank of America	Holiday Inn on the Bay	-109.40	Management
	13	Calif Storm Water Quality As	CASQA BMP Training	480.00	Management
	10	Bank of America	Hertz Rent a Car	-63.00	Management
	13	Calif Storm Water Quality As	CASWA CA BMP Training	480.00	Management
	11	Bank of America	CASQA & APWA Mtgs-Oakland Intl	25.00	Management
	11	Bank of America	CASQA & APWA Mtgs-Union 76	10.82	Management
	11	Bank of America	CASQA & APWA Mtgs-Hertz	152.55	Management
	11	Bank of America	CASQA & APWA Mtgs-City of Fres	16.00	Management
	11	David J Pomaville	CASQA Meeting	62.00	Management
	10	Bank of America	CASQA - Hyatt Regency	155.72	Management
	10	Bank of America	CASQA Meeting-Fresno Parking	16.00	Management
	10	Bank of America	CASQA - Hertz	152.19	Management
	10	Bank of America	CASQA - City of Sacto Parking	5.25	Management
	Item Number		**Total General Expenses**	**14,150.97**	
Subtotals	10		Travel7035	1,780.30	Management
	11		Meetings/Conferences7035	1,396.37	Management
	12		Dues/Fees7035	10,000.00	Management
	13		Training7035	960.00	Management
	14		Misc7035	14.30	Management
			Total	14,150.97	
			Difference	0.00	

Table D-7. Continued.

Industrial NPDES Prog Development 7040-7046

Consulting Services

15	GeoSyntec Consultants	2001-2002 Stormwater Monitorin	518.75	Industrial
15	GeoSyntec Consultants	2001-2002 SWQM	20.75	Industrial
15	GeoSyntec Consultants	2001-2002 SWQ Monitoring	2,488.20	Industrial
16	GeoSyntec Consultants	Service through 12/03/2002	2,842.11	Industrial
15	GeoSyntec Consultants Inc	03/2003 SWQ Monitoring	1,258.50	Industrial
17	GeoSyntec Consultants Inc	05/2002 Communication Fee	56.16	Industrial
15	GeoSyntec Consultants Inc	4/2003 Storm Water Monitoring	8,106.58	Industrial
15	GeoSyntec Consultants Inc	02-03 Storm Water Monitoring	1,320.00	Industrial
16	GeoSyntec Consultants Inc	Service thru 06/30/03	3,465.00	Industrial
15	GeoSyntec Consultants Inc	02-03 Stormwater Monitoring	1,771.00	Industrial

Item Number			
	Total Consulting Services	**21,847.05**	
Subtotal 15	GeoSWQM7041	15,483.78	Industrial
16	GeoService7041	6,307.11	Industrial
17	Misc7041	56.16	Industrial
	Total	21,847.05	
	Difference	0.00	

Public Information

18	Bank of America	Albertson-PIE Meeting	26.16	Public Education

SWQM Operations & Maintenance 7050-7057

SWQM Detention Basin Operations and Maintenance

20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
24	R/C Mow-N-Edge Corporation		136.51	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
24	Mow-N-Edge Corporation	Dev Unit II	136.51	Post Construction
21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
24	Pacific Gas & Electric Compa	Line Extension Deficiency	403.86	Post Construction
19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	136.51	Post Construction
21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
24	Cobb's Tree Care	Agreement 2003-12	320.00	Post Construction
19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	136.51	Post Construction
21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
19	Mow-N-Edge Corporation	6/03 Dev Basin Maint-Unit 2	136.51	Post Construction
19	Mow-N-Edge Corporation	6/03 Dev Basin Maint-Unit 2	-150.00	Post Construction
21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
21	Wildlife Control Technology	4/2003 Rodent Control	40.00	Post Construction
21	Wildlife Control Technology	5/2003 Rodent Control	40.00	Post Construction
21	Wildlife Control Technology	6/2003 Rodent Control	40.00	Post Construction
19	Lucas Weed Control, LLC	07/2002 Undeveloped Basin Main	106.37	Post Construction
19	Lucas Weed Control, LLC	08/2002 Undeveloped Basin Main	106.37	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	09/2002 Undeveloped Basin Main	106.37	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	10/2002 Undeveloped Basin Main	106.37	Post Construction
19	Lucas Weed Control, LLC	11/2002 Undeveloped Basin Main	106.37	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	12/2002 Undeveloped Basin Main	106.37	Post Construction

Table D-7. Continued.

20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Irly-Bird Landscape Company	01/2003 Undev Basin Maint	82.89	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Irly-Bird Landscape Company	2003 Undev Basin Maint Unit II	82.89	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
19	Irly-Bird Landscape Company	3/03 Undev Basin Maint Unit II	82.89	Post Construction
21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
19	Irly-Bird Landscape Company	4/03 Undev Basin Maint Unit II	82.89	Post Construction
21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
22	Cobb's Tree Care	Agreement #2002-12	290.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
24	Mow-N-Edge Corporation	2002 SWQM Detention Basin O &	562.49	Post Construction
19	Lucas Weed Control, LLC	07/02 Undev Basin Maint-Extra	80.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	1,329.68	Post Construction
19	Mow-N-Edge Corporation	2002 Developed Basin Maint	562.49	Post Construction
19	Mow-N-Edge Corporation	2002 Developed Basin Maint	49.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Mow-N-Edge Corporation	09/2002 Developed Basin Mainte	562.49	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	1,048.86	Post Construction
19	Mow-N-Edge Corporation	10/2002 Developed Basin Mainte	562.49	Post Construction
19	Mow-N-Edge Corporation	11/2002 Developed Basin Mainte	562.49	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	223.42	Post Construction
19	Mow-N-Edge Corporation	12/2002 Developed Basin Mainte	562.49	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Mow-N-Edge Corporation	01/2003 Developed Basin Mainte	573.73	Post Construction
19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	573.73	Post Construction
23	City of Fresno	6302 W Spruce Ave	115.62	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
24	Mow-N-Edge Corporation	Dev Unit II Extra Work	104.13	Post Construction
24	Mow-N-Edge Corporation	Dev Unit II	573.73	Post Construction
21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	128.46	Post Construction
19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	573.73	Post Construction
21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	573.73	Post Construction
21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	592.84	Post Construction
19	Mow-N-Edge Corporation	6/03 Dev Basin Maint-Unit 2	573.73	Post Construction
21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
19	Lucas Weed Control, LLC	07/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	08/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	09/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	10/2002 Undeveloped Basin Main	102.50	Post Construction
19	Lucas Weed Control, LLC	11/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	12/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Irly-Bird Landscape Company	01/2003 Undev Basin Maint	68.95	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Irly-Bird Landscape Company	2003 Undev Basin Maint Unit II	68.95	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
19	Irly-Bird Landscape Company	3/03 Undev Basin Maint Unit II	68.95	Post Construction
21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
19	Irly-Bird Landscape Company	4/03 Undev Basin Maint Unit II	68.95	Post Construction

Table D-7. Continued.

	21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
	21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
	19	Lucas Weed Control, LLC	07/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	08/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	09/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	10/2002 Undeveloped Basin Main	38.68	Post Construction
	19	Lucas Weed Control, LLC	11/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	12/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Irly-Bird Landscape Company	01/2003 Undev Basin Maint	2.94	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Irly-Bird Landscape Company	2003 Undev Basin Maint Unit II	2.94	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
	19	Irly-Bird Landscape Company	3/03 Undev Basin Maint Unit II	2.94	Post Construction
	21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
	19	Irly-Bird Landscape Company	4/03 Undev Basin Maint Unit II	2.94	Post Construction
	21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
	21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
	Item Number		**Total SWQM Detention Basins Operations & Maintenance**	**17,980.16**	
Subtotal	19		Undev/DevBasinMaint7051	8,174.05	Post Construction
	20		WildAgree2002-047051	2,460.00	Post Construction
	21		RodentControl7051	1,380.00	Post Construction
	22		CobbAgree2002-127051	290.00	Post Construction
	23		CitySpruceAve7051	3,438.88	Post Construction
	24		Misc7051	2,237.23	Post Construction
			Total	17,980.16	
			Difference	0.00	

SWQM Retention Basin Operations and Maintenance

Seibert's Oil Company Inc	07/2002 Diesel Fuel	114.50	Post Construction
Seibert's Oil Company Inc	07/2002 Diesel Fuel	117.90	Post Construction
Seibert's Oil Company Inc	07/2002 Diesel Fuel	115.33	Post Construction
Seibert's Oil Company Inc	08/2002 Diesel Fuel	80.27	Post Construction
Matthews & Son	Agreement #2002-01	1,630.50	Post Construction
Matthews and Sons	Agreement #2002-01	35.00	Post Construction
Safety Network	Equipment Rental	180.00	Post Construction
Safety Network	7/21/02-8/02/02 Equip Rental	253.00	Post Construction
Chevron	Fuel	9.86	Post Construction
Cardlock Fuels System Inc	Fuel through 5/31/03	33.41	Post Construction
Matthews and Sons	Agreement #2002-01	280.00	Post Construction
R/C Matthews & Son		455.00	Post Construction
Cardlock Fuels System Inc	07/31/2002 Fuel	9.53	Post Construction
Matthews and Sons	Agreement #2002-01	4,345.13	Post Construction
Video Inspection Specialists	Cleaning w/ Vacuum Truck	435.00	Post Construction
R/C Matthews and Sons		273.75	Post Construction
R/C Matthews and Sons		542.50	Post Construction
Cerutti & Sons Transportatio	Agreement #2002-09	290.55	Post Construction
Matthews and Sons	Agreement #2002-01	180.84	Post Construction
Emmetts Excavation Grading &	Agreement #2002-18	770.00	Post Construction
Cardlock Fuels System Inc	08/2002 Pump Fuel	68.49	Post Construction
Cardlock Fuels System Inc	09/2002 Diesel	59.49	Post Construction
Cardlock Fuels System Inc	10/15/2002 Pump Fuel/Truck Fue	28.27	Post Construction
Cardlock Fuels System Inc	10/31/2002 Diesel Fuel	15.02	Post Construction
Cerutti & Sons Transportatio	Agreement #2002-09	961.05	Post Construction
Matthews and Sons	Agreement #2002-01	180.83	Post Construction
Emmetts Excavation Grading &	Agreement #2002-18	770.00	Post Construction
Cardlock Fuels System Inc	08/2002 Pump Fuel	62.98	Post Construction
Cardlock Fuels System Inc	08/2002 Truck Fuel	7.14	Post Construction

Table D-7. Continued.

		Cardlock Fuels System Inc	09/2002 Diesel Fuel	40.49	Post Construction
		Cardlock Fuels System Inc	09/2002 Diesel	389.47	Post Construction
		Cardlock Fuels System Inc	10/15/2002 Pump Fuel/Truck Fue	28.26	Post Construction
		Cardlock Fuels System Inc	10/31/2002 Diesel Fuel	20.16	Post Construction
		Cardlock Fuels System Inc	09/2002 Diesel Fuel	29.62	Post Construction
		R/C Matthews & Son		350.00	Post Construction
		R/C Matthews and Sons		245.00	Post Construction
		Matthews and Sons	Agreement #2002-01	1,487.50	Post Construction
		Video Inspection Specialists	Cleaning w/ Vacuum Truck	580.00	Post Construction
		R/C Matthews and Sons		262.50	Post Construction
		E & J Gallo Winery	Greenwaste Deliveries	1,155.00	Post Construction
		Matthews and Sons	Agreement #2002-01	7,731.25	Post Construction
		Matthews and Sons	Agreement #2002-01	326.26	Post Construction
		E & J Gallo Winery	09/2002 Greenwaste Deliveries	1,195.00	Post Construction
		Matthews and Sons	Agreement #2002-01	611.25	Post Construction
		E & J Gallo Winery	11/2002 Greenwaste	15.00	Post Construction
		Cerutti & Sons Transportatio	Agreement #2002-09	573.65	Post Construction
		Matthews and Sons	Agreement #2002-01	180.83	Post Construction
		Emmetts Excavation Grading &	Agreement #2002-18	1,020.00	Post Construction
	Item Number		**Total SWQM Retention Basin O&M**	**28,546.58**	
Subtotal	25		Fuel7052	1,230.19	Post Construction
	26		M&SAgree2002-017052	16,989.39	Post Construction
	27		EquipRental7052	433.00	Post Construction
	28		Greenwaste7052	2,365.00	Post Construction
	29		CleaningVacuumTruck7052	1,015.00	Post Construction
	30		M&SBlank7052	2,128.75	Post Construction
	31		CeruttiAgree2002-097052	1,825.25	Post Construction
	32		EmmettsAgree2002-187052	2,560.00	Post Construction
			Total	28,546.58	
			Difference	0.00	
		SWQM Structures Operations and Maintenance			
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	24.17	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	290.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	435.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	330.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Cleaning & Root Cuttin	330.00	Pollution Prevention
	33	Video Inspection Specialists	10/2002 Vacuum Cleaning	217.50	Pollution Prevention
	33	Video Inspection Specialists	Cleaning w/ Vacuum Truck	362.50	Pollution Prevention
	33	Video Inspection Specialists	Clean w/Vacuum Truck	1,550.00	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	217.50	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	145.00	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	24.17	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	290.00	Pollution Prevention
	33	Video Inspection Specialists	Clean w/Vacuum Truck & TV Insp	2,195.00	Pollution Prevention
	34	City of Fresno	7/02-3/03 Pipeline Maint	288.10	Pollution Prevention
	34	City of Fresno	7/02-3/03 Pipeline Maint	296.10	Pollution Prevention
	33	Video Inspection Specialists	10/2002 Vacuum Cleaning	217.50	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	145.00	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	24.16	Pollution Prevention
	34	City of Fresno	7/02-3/03 Pipeline Maint	72.36	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Cleaning	362.50	Pollution Prevention
	33	Video Inspection Specialists	10/2002 Vacuum Cleaning	217.50	Pollution Prevention
	33	Video Inspection Specialists	03/2003 Vacuum Truck Cleaning	310.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	145.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	580.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Cleaning & Root Cuttin	290.00	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Cleaning	507.50	Pollution Prevention
	33	Video Inspection Specialists	Clean w/Vacuum Truck	310.00	Pollution Prevention
	Item Number		**Total SWQM Structures O&M**	**10,176.56**	
Subtotal	33		VISTruckCleaning7054	9,520.00	Pollution Prevention
	34		FresnoPipeline7054	656.56	Pollution Prevention
			Total	10,176.56	
			Difference	0.00	

Table D-7. Continued.

		SWQM Pump Operations and Maintenance			
	35	Video Inspection Specialists	Clean w/Vacuum Truck	155.00	Pollution Prevention
	35	Video Inspection Specialists	7/2002 Pump Station Vacuum Cle	580.00	Pollution Prevention
	35	Video Inspection Specialists	7/2002 Pump Station Vacuum Cle	507.50	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Cleaning & Root Cuttin	742.50	Pollution Prevention
	35	Video Inspection Specialists	Clean w/Vacuum Truck	787.50	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Vacuum Cleaning	253.75	Pollution Prevention
	35	Video Inspection Specialists	Clean w/Vacuum Truck	310.00	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Cleaning & Root Cuttin	330.00	Pollution Prevention
	35	Video Inspection Specialists	Clean w/Vacuum Truck	232.50	Pollution Prevention
	35	Video Inspection Specialists	03/2003 Vacuum Truck Cleaning	290.00	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Vacuum Cleaning	217.50	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	217.50	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	290.00	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	72.50	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	580.00	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	72.50	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/03/02-11/18/02 Service	49.49	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service through 12/17/2002	32.56	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 10/12/02-01/03/03	51.17	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 04/17/03	7.67	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 05/12/03 Pump Sit	28.67	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service through 7/18/03	86.03	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service through 6/18/03	86.03	Pollution Prevention
	36	Pacific Gas & Electric Compa	07/03/02-08/02/02 Service	10.80	Pollution Prevention
	36	Pacific Gas & Electric Compa	08/02/02-09/03/02 Service	10.80	Pollution Prevention
	36	Pacific Gas & Electric Compa	09/03/02-10/02/02 Service	10.80	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/02/02-10/31/02 Service	10.80	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/31/02-11/27/02 Service	11.50	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 10/12/02-01/03/03	12.98	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/12/02-01/03/03 Service	14.22	Pollution Prevention
	36	Pacific Gas & Electric Compa	03/2003 Site Pump Utilities	12.47	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 04/10/03 Pump Sit	11.94	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 05/12/03 Pump Sit	11.91	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 06/11/03 Pump Sit	22.37	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 7/11/03	10.29	Pollution Prevention
	36	Pacific Gas & Electric Compa	07/03/02-08/02/02 Service	126.05	Pollution Prevention
	36	Pacific Gas & Electric Compa	08/02/02-09/03/02 Service	79.22	Pollution Prevention
	36	Pacific Gas & Electric Compa	09/03/02-10/02/02 Service	76.74	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/02/02-10/31/02 Service	57.03	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/31/02-11/27/02 Service	24.12	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 10/12/02-01/03/03	10.29	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/12/02-01/03/03 Service	11.36	Pollution Prevention
	36	Pacific Gas & Electric Compa	03/2003 Site Pump Utilities	10.65	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 04/10/03 Pump Sit	10.65	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 05/12/03 Pump Sit	11.39	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 06/11/03 Pump Sit	13.46	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 7/11/03	83.81	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	145.00	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Vacuum Cleaning	108.75	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Vacuum Cleaning	181.25	Pollution Prevention
	35	Video Inspection Specialists	Clean w/Vacuum Truck	155.00	Pollution Prevention
Item Number			**Total SWQM Pump O&M**	**7,236.02**	
Subtotal	35		VISTruckCleaning7055	6,228.75	Pollution Prevention
	36		PGEService7055	1,007.27	Pollution Prevention
			Total	7,236.02	
			Difference	0.00	
SWQM Other Operations and Maintenance					
	37	Melco Fence	02/2003 Fence Repair	584.00	Post Construction
		SWQM Soil Monitoring			
	38	BSK Analytical Laboratories	Low Level Lead Profile	297.00	Post Construction
	38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	99.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	396.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	363.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	264.00	Post Construction
	38	BSK Analytical Laboratories	07/03/2002 Low Level Lead Prof	198.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	363.00	Post Construction
	38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	99.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	198.00	Post Construction
	38	BSK Analytical Laboratories	07/03/2002 Low Level Lead Prof	66.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	132.00	Post Construction
	38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	99.00	Post Construction
	38	BSK Analytical Laboratories	07/11/2002 Low Level Lead Prof	396.00	Post Construction
	38	BSK Analytical Laboratories	07/15/2002 Low Level Lead Prof	396.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	396.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	198.00	Post Construction
	38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	99.00	Post Construction
	38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	99.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	132.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	99.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile-II3	165.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	396.00	Post Construction
	38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	264.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	198.00	Post Construction

Table D-7. Continued.

38	BSK Analytical Laboratories	Low Level Lead Profile	198.00	Post Construction
38	BSK Analytical Laboratories	10/2002 Low Level Lead Profile	396.00	Post Construction
38	BSK Analytical Laboratories	11/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	10/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	11/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	09/2002 Low Level Lead Profile	297.00	Post Construction
38	BSK Analytical Laboratories	09/2002 Low Level Lead Profile	231.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	396.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	198.00	Post Construction
38	BSK Analytical Laboratories	09/2002 Low Level Lead Profile	198.00	Post Construction
38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	396.00	Post Construction
38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	297.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	279.00	Post Construction
38	BSK Analytical Laboratories	Low Level Lead Profile-Bal Due	18.00	Post Construction
38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	231.00	Post Construction
38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	231.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	66.00	Post Construction
38	BSK Analytical Laboratories	09/2002 Low Level Lead Profile	198.00	Post Construction
38	BSK Analytical Laboratories	05/2002 Low Level Lead Profile	165.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	297.00	Post Construction
38	BSK Analytical Laboratories	10/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	11/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	05/2002 Low Level Lead Profile	165.00	Post Construction
38	BSK Analytical Laboratories	05/2002 Low Level Lead Profile	165.00	Post Construction
Item Number				
38		**Total SWQM Soil Monitoring**	10,428.00	Post Construction

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Investigation, Inspection, Enforcement

39	Fotech Color Labs	08/2002 Photos	6.00	Illicit Discharge
39	Fotech Color Labs	07/2002 Photos	16.66	Illicit Discharge
39	Fotech Color Labs	Photo Developing	53.83	Illicit Discharge
Item Number				
39		**Total Investigation, Inspection, Enforcement**	76.49	Illicit Discharge

Monitoring

42	AirLink Communications	08/2002 IP Activation Fee	45.00	Monitoring
41	AT&T Wireless Services	07/14/2002-08/13/2002 Services	26.18	Monitoring
40	Larry Walker Associates Inc	Storm Water Quality Monitoring	10,552.33	Monitoring
41	AT&T Wireless Services	08/14/02-09/13/02 Service Peri	23.76	Monitoring
42	AirLink Communications	07/24/02-08/23/02 Telemetry Fe	58.06	Monitoring
40	Larry Walker Associates Inc	2002-2003 Stormwater Monitorin	1,823.85	Monitoring
40	Larry Walker Associates Inc	2001-2002 Stormwater Monitorin	8,756.96	Monitoring
40	Larry Walker Associates Inc	2001-2002 Stormwater Monitorin	3,192.74	Monitoring
42	AirLink Communications	10/2002 Telemetry Monthly Fee	98.00	Monitoring
41	AT&T Wireless Services	09/14/02-10/13/02 Service	23.35	Monitoring
42	Airlink Communications Inc	09/24/02-10/23/02 Monthly Fee	98.00	Monitoring
41	AT&T Wireless Services	10/14/02-11/13/02 Service	23.98	Monitoring
43	Larry Walker Associates Inc	10/01/02-10/31/02 Professional	7,816.19	Monitoring
43	Larry Walker Associates Inc	09/01/02-09/18/02 Professional	4,692.12	Monitoring
40	Larry Walker Associates Inc	2002-2003 SWQ Monitoring	18,662.34	Monitoring
42	Airlink Communications Inc	Service through 11/23/2002	98.00	Monitoring
41	AT&T Wireless Services	Service through 12/13/2002	23.56	Monitoring
41	AT&T Wireless Services	Service thru 01/15/2003	23.46	Monitoring
43	Larry Walker Associates Inc	Service thru 12/31/2002	27,576.10	Monitoring
42	Airlink Communications Inc	Services thru 12/23/2002	98.00	Monitoring
41	AT&T Wireless Services	Service thru 02/13/03	25.75	Monitoring
40	Larry Walker Associates Inc	2002-2003 SWQ Monitoring	17,728.24	Monitoring
42	Airlink Communications Inc	Service thru 01/23/03	98.00	Monitoring
42	Airlink Communications Inc	02/23/03 Monthly Fee	98.00	Monitoring
41	AT&T Wireless Services	03/15/03 Billing	23.61	Monitoring
40	Larry Walker Associates Inc	02/2003 SWQ Monitoring	14,544.32	Monitoring

Table D-7. Continued.

	41	AT&T Wireless Services	Service thru 04/13/03	21.18	Monitoring
	40	Larry Walker Associates Inc	02-03 Storm Water Monitoring	14,464.70	Monitoring
	42	Airlink Communications Inc	IP Local - Unlimited	98.00	Monitoring
	42	Airlink Communications Inc	IP Local Unlimited	98.00	Monitoring
	41	AT&T Wireless Services	Service Through 5/13/2003	23.24	Monitoring
	40	Larry Walker Associates Inc	02-03 Storm Water Monitoring	17,532.15	Monitoring
	44	Water Env Research Foundatio	03/04 Subscription to WERF	10,000.00	Monitoring
	40	Larry Walker Associates Inc	02-03 Stormwater Quality Monit	12,274.56	Monitoring
	42	Airlink Communications Inc	IP Usage through 6/23/03	98.00	Monitoring
	42	Airlink Communications Inc	IP Local Service through 5/23/	98.00	Monitoring
	41	AT&T Wireless Services	Service through 6/15/2003	22.42	Monitoring
	41	AT&T Wireless Services	Service through 7/13/03	21.50	Monitoring
	40	Larry Walker Associates Inc	02-03 Stormwater Monitoring	24,331.20	Monitoring
	Item Number		**Total Monitoring**	**195,312.85**	
Subtotal	40		LWASWQM7063	143,863.39	Monitoring
	41		ATTService7063	281.99	Monitoring
	42		AirlinkIP7063	1,083.06	Monitoring
	43		LWAProf7063	40,084.41	Monitoring
	44		WERF7063	10,000.00	Monitoring
			Total	195,312.85	
			Difference	0.00	
		Public Information			
	45	Cash	Vons	10.70	Management
	46	David J Pomaville	Clean Water Award Reimbursemen	22.62	Public Education
	46	Pro Image Video LLC	Transfer PSA from VHS to Digit	276.97	Public Education
	48	Bank of America	Office Depot	55.16	Management
	46	Pro Image Video LLC	08/2002 Duplicate PSA VHS Tape	21.58	Public Education
	46	Fotech Color Labs	Dev & Prints	18.72	Public Education
	52	River Parkway Trust	Reimbursement Storm Water Gran	1,920.00	Public Education
	45	Cash	Casa Valadez Mexican Restauran	12.40	Management
	46	Panagraph Inc	2002-2003 SWQMP Public Info &	255.00	Public Education
	47	Fotech Color Labs	09/2002 Dev & Print	7.51	Management
	48	Fresno Ag Hardware	09/2002 Supplies	4.80	Management
	46	San Joaquin River Parkway	Clean Storm Water Grant Reimb	1,899.45	Public Education
	45	Bank of America	Vons Grocery Store	11.49	Management
	45	Bank of America	Vons Grocery Store	24.33	Management
	48	Cash	Orchard Supply	5.18	Management
	45	Cash	Riverfest 2002 Food	15.50	Management
	47	Prestige Printing	10/2002 Letterheads-Storm Wate	606.26	Management
	48	Bank of America	Office Max	28.80	Management
	56	San Joaquin River Parkway Tr	Fresno City Parks & Rec CSW Gr	1,000.00	Management
	46	City Press	10/2002 Action Alert Flyers	625.00	Public Education
	46	City Press	10/2002 Action Alert Flyers	49.22	Public Education
	45	Bank of America	Vons	44.98	Management
	49	SWRCB	Waste Discharge Req Annual Fee	1,500.00	Management
	49	SWRCB	Waste Discharge Req Annual Fee	10,000.00	Management
	49	SWRCB	Waste Discharge Req Annual Fee	2,500.00	Management
	49	SWRCB	Waste Discharge Req Annual Fee	3,750.00	Management
	46	Bank of America	Kinko's	224.10	Public Education
	48	Bank of America	OfficeMax	37.65	Management
	45	Bank of America	Bobby Salazar's	29.35	Management
	56	Bank of America	Env-Sol-Com	203.00	Management
	52	River Parkway Trust	Clean Storm Water Grant Reimb	50.00	Public Education
	50	Daniel P Rourke	Mileage Reimbursement	85.05	Management
	46	Pro Image Video LLC	12/2002 Public Information	149.08	Public Education
	45	Bank of America	Bobby Salazars	37.87	Management
	56	Bank of America	Amazon.Com	232.20	Management
	50	Bank of America	Hyatt Regency Monterey	297.68	Management
	45	Cash	SaveMart Supermarkets	9.14	Management
	50	Daniel P Rourke	Ineligible Portion-Hyatt	-4.28	Management
	51	Daniel P Rourke	CWEA Conference-Peninsula Rest	22.50	Management
	50	Daniel P Rourke	CWEA Conference Mileage Reimb	115.20	Management
	51	Daniel P Rourke	CWEA Conference-Goomba's Kitch	19.00	Management
	51	Daniel P Rourke	CWEA Conference-Jugem Japanese	13.89	Management

Table D-7. Continued.

46	Panagraph Inc	Service thru 01/2003	2,015.13	Public Education
46	City Press	02/2003 Storm Water Pollution	1,048.39	Public Education
51	Daniel P Rourke	03/2003 WRPPN Meetings-040-LJX	11.50	Management
51	Daniel P Rourke	WRPPN Committee Meeting-Zocalo	12.50	Management
51	Daniel P Rourke	03/2003 WRPPN Meetings-Hamburg	13.04	Management
51	Daniel P Rourke	WRPPN Committee Meeting-Hungry	7.50	Management
46	Panagraph Inc	2002-2003 SWQMP	382.50	Public Education
45	Bank of America	Fresno Audio Visual - Vons	24.70	Management
56	Bank of America	Fresno Audio Visual - Cinnamon	141.25	Management
56	Bank of America	Fresno Audio Visual - Mariscos	24.92	Management
45	Bank of America	Fresno Audio Visual - Food 4 L	2.85	Management
56	Bank of America	OSH-Brass Grommet	25.94	Management
56	Bank of America	Fresno Audio Visual - DiCiccos	65.59	Management
56	Bank of America	Fresno Audio Visual - Cinnamon	47.00	Management
45	Bank of America	Fresno Audio Visual - Vons	17.85	Management
56	Bank of America	Fresno Audio Visual - Draper S	18.32	Management
56	Cash	Fresno Pollution Prevention Gr	16.53	Management
52	Central Unified School Distr	2003 Clean Storm Water Grant	1,527.49	Public Education
48	Fresno Ag Hardware	Devoe Traffic Gal/Pail/Bucket	40.27	Management
52	Liberty Elementary	2003 Clean Storm Water Grant	52.00	Public Education
54	Daniel P Rourke	CASQA-BMP Handbook Workshop	27.40	Management
52	Liberty Elementary	Clean Storm Water Grant	68.00	Public Education
56	Bank of America	Vons-Me n Eds-Intergrated Pest	50.65	Management
46	Panagraph Inc	Services thru 03/2003	616.25	Public Education
56	Asian Pacific American Herit	Booth Space/Sponsorship	250.00	Management
47	Cash	Aerial Photocopies	2.00	Management
46	Zoo Lynx	2003 Earth Day Ad & Clean Up	965.00	Public Education
47	Airport Blueprint Inc	Aerial Photos	5.83	Management
55	Consolidated Printworks	Utility Bill Inserts	316.00	Public Education
46	Panagraph Inc	SWQMP Public Info & Education	38,102.22	Public Education
52	UC Regents	Clean Storm Water Grant	2,000.00	Public Education
54	Bank of America	El Pollo-CASQA BMP Handbook Mt	6.80	Management
54	Bank of America	CASQA BMP Handbook Workshop	25.00	Management
53	Bank of America	Hertz-SWQ BMP Training	152.95	Management
53	Bank of America	Hyatt-SWQ BMP Training	95.58	Management
56	Bank of America	The Upper Crust-SWQ BMP Traini	13.21	Management
56	Bank of America	The Thai House-GeoSyntec Meeti	49.00	Management
56	Bank of America	NTIS-EPA-Document	56.00	Management
54	Bank of America	Mariscos-CASQA BMP Handbook Mt	7.01	Management
53	Bank of America	Hyatt-SWQ BMP Training-Parking	12.00	Management
53	Bank of America	Hyatt-SWQ BMP Training-Meals	40.09	Management
55	City Press	Utility Bill Inserts	1,097.74	Public Education
56	Cash	Fresno Audio Visual	21.04	Management
56	Cash	Costco-Open Space Const	67.39	Management
51	Cash	Vons-Phase II Meeting	11.83	Management
56	Solon Manufacturing Co Inc	Paint Paddles	6,829.59	Management
52	Central High School-Env Scie	2003 Clean Storm Water Grant	1,823.87	Public Education
55	City Press	Utility Bill Inserts	1,111.18	Public Education
56	City Press	Stormwater Pollution Packets	878.60	Management
56	City Press	Gardening Tips Bill Insert Cre	-296.05	Management
50	Daniel P Rourke	Mileage Reimbursement	108.36	Management
56	State of CA-WRCB		-2,500.00	Management
56	Consolidated Printworks	Watering Schedule Insert	222.93	Management
46	Panagraph Inc	02-03 Public Info & Education	44,846.40	Public Education
56	Bank of America	City of Fresno-Zoning Ordinanc	25.00	Management
45	Bank of America	Bobby Salazars-Lunch Meeting	64.52	Management
56	Bank of America	OSH-Garden Sprayer	21.62	Management
45	Bank of America	Javiers-Business Lunch	35.00	Management
46	Bank of America	Sir Speedy Printing-Clovis Zon	20.55	Public Education
56	Bank of America	Paper Plus-Environmental Fact	40.93	Management
46	City of Fresno Parks & Recre	2002 Clean Storm Water Grant	1,000.00	Management
46	Jack Nadel, Inc	#2 Pencils/Screen Set Up Charg	1,350.41	Management
46	Linda Jacobsen	Clean Storm Water Grant Reimb	43.11	Management
46	Panagraph Inc	06/2003 Services SWQMP Info	2,445.61	Management
52	San Joaquin River Parkway &	2003 Clean Storm Water Grant	80.00	Management

Table D-7. Continued.

	Item Number				
			Total Public Information	**133,892.99**	
Subtotal	45		Food7064	340.68	Management
	46		PublicEducation7064	96,377.31	Public Education
	47		Printing7064	621.60	Management
	48		OfficeSupplies7064	171.86	Management
	49		SWRCBFees7064	17,750.00	Management
	50		Travel7064 (Mileage, Hotels)	602.01	Management
	51		ConferenceMeetings7064	111.76	Management
	52		Grant7064	7,521.36	Public Education
	53		Training7064	300.62	Management
	54		Handbooks7064	66.21	Management
	55		UtilityBill7064	2,524.92	Public Education
	56		Misc7064	7,504.66	Management
			Total	133,892.99	
			Difference	0.00	
		General Expenses		0.00	
		Program Expenses			
	57	Quercus Publications	Streams of the SJV Book	55.50	Management
	57	Bank of America	NTIS-Groundwater Contamination	56.00	Management
	Item Number				
	57		**Total Program Expenses**	**111.50**	Management
Industrial NPDES Program Implementation 7070-7076					
		Investigation, Inspection, Enforcement			
	58	City Press	Phone Complaints - Forms	332.96	Industrial
		Monitoring		0.00	
		Public Information			
	59	The Business Journal	Newspaper Subscription	88.00	Public Education
	59	EXCAL Visual Communications	08/2002 Storm Water Training K	1,013.50	Public Education
	59	Panagraph Inc	Services thru 12/2002	13,993.30	Public Education
	Item Number				
	59		**Total Public Information**	**15,094.80**	Public Education
(Source: Rourke, pc, 3/23/04			**Total of Subtotals**	**$ 611,843.66**	

1. Cost Categories Abbreviated According to the Following:

Construction: Construction Site Stormwater Runoff Control
Illicit Discharge: Illicit Discharge Detection and Elimination
Industrial: Industrial and Commercial Management Programs
Management: Overall Stormwater Program Management
Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
Post Construction: Post Construction Water Management in New Development and Redevelopment
Public Education: Public Education, Outreach, Involvement, and Participation
Monitoring: Water Quality Monitoring
Watershed: Watershed Management

The backup calculations for the cost for each cost survey category in Section 7 and the sources of the cost data are presented in this appendix. Tables are generally presented by sequentially increasing levels of detail. Figure E-1 illustrates how data is shared throughout the tables.

Table E-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 7, Table 7-2. The remaining tables (E-2 through E-9) present the detailed back-up information for the numbers in Table E-1. Table E-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table E-2. Item numbers corresponding to the subtotals in Table E-2 were added to the left hand column to easily show how the numbers are pulled forward to Table E-1. The right hand column in Table E-2 was added to show how costs were allocated to the cost survey categories. Table E-1 entries that were not taken directly from Table E-2 are found in Tables E-3 through E-9.

For the city of Sacramento, labor costs are distributed among the various cost survey categories according to labor cost spreadsheets provided by city staff (Table E-7). Thus, comparing costs with other municipalities where such costs are not distributed, Sacramento's Overall Stormwater Management Program costs will be lower.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

Construction Site Stormwater Runoff Control

The total cost for this category was $261,716. The costs for this category include labor, which was broken down into three categories: inspections, student interns, and all other activities. There was also cost identified for developing BMP handbooks (one time annual cost, but may occur at a time later than one year). Other activities performed included (descriptions obtained from annual stormwater report):

- Issued 144 grading permits
- Reviewed 68 SWPPPs
- Issued 384 enforcement actions
- Sent winterization letters to property owners with active construction sites to remind contractors to prepare their construction sites for the rainy season and to submit winterization certifications
- Developed a Microsoft Access database to track all stormwater inspections and enforcement actions for private development construction sites

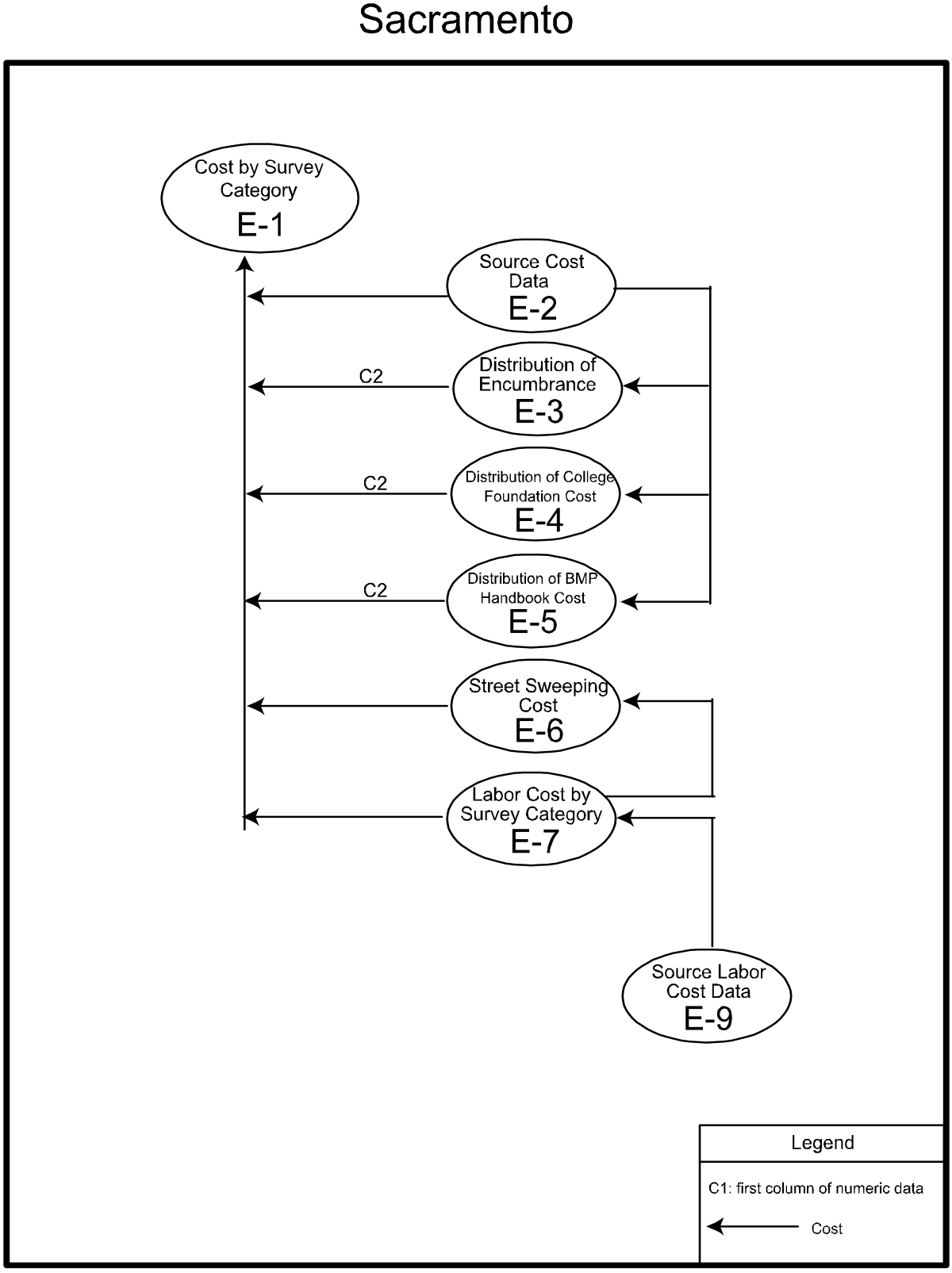

Figure E-1. Sacramento Flowchart

Illicit Discharge Detection and Elimination (IDDE)

The total cost for this category was $37,507. Labor cost is the only cost allocated to this category. Activities performed included issuance of 55 enforcement actions and investigation of all 83 calls received involving suspected illicit discharge (Sacramento, 2003b).

Industrial and Commercial Management Programs

The total cost for this category was $42,318. Approximately 94 percent of the cost was for stormwater staff labor. The other identified cost was for developing BMP handbooks (one time annual cost, but may occur at a time later than one year). Other activities included issuance of 41 enforcement actions, development of BMP brochures for the auto body, auto washing, and auto repair industry, and creation of a Clean Water Business Partner program for the mobile pressure washing industry (Sacramento, 2003b).

Overall Stormwater Program Management

The total cost for this category was $281,501. Activities in this program were as follows:

- Office products
- Planning
- Annual reporting
- CASQA membership fees
- Mailing
- NPDES fees
- Legal fees
- Miscellaneous
- Stormwater staff labor

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost for this category was $3,270,806. Most of the cost for this category was for the activities of street sweeping (40 percent), drainage system maintenance (46 percent), and pump station cleaning (13 percent).

Street sweeping costs were also estimated by city staff. Street sweeping cost was estimated at $1.6 million. Street sweeping costs included the cost of sweeping 3 percent of the core downtown area 7 extra times a month which is beyond the city's permit requirement (Busath, pers. comm., 11/21/04). Due to this an annual required compliance cost was calculated for the city based on the $1.6 million estimate and permit required street sweeping frequencies (Table E-7). The calculated annual required compliance cost was $1,322,748.

Sump, drain inlet, manhole, and drain line and channel cleaning performed by city staff was reported under the Field Services labor category in Table E-8. Equipment costs for this effort was not available, but was roughly estimated as 75 percent of the labor costs as a result of consultation with city staff. This brings the total cost for drainage system maintenance to $1,514,926.

Lastly, $2,500 was attributable to this category for development of BMP handbooks (one time cost, but may occur less frequent than annually due to updates). The city also performed inspection and maintenance of parking lots (Sacramento, 2003b).

Due to inaccurate use of labor codes by city personnel for pump station cleaning, these costs were estimated by the city of Sacramento staff rather than relying on accounting record reports (Busath, pers. comm., 11/21/03). The reported labor cost of $22,552 from Table E-8 was not used in this report. Pump station cleaning, including equipment costs, was estimated at $420,000 (Busath, pers. comm., 1/11/05).

Post Construction Stormwater Management in New Development and Redevelopment

The total cost of this category was $38,517. The labor costs for this category were broken down in the same way as the Construction Site Stormwater Runoff Control category. There was also cost identified for development of BMP handbooks (one time annual cost, but may occur at a time later than one year)

Public Education, Outreach, Involvement, and Participation

The total cost of this category was $361,440. The costs associated with this category were for the following activities:

- Developing Integrated Pest Management (IPM)
- Television
- Radio
- Billboard
- Newspaper
- Mailings
- Participation in public events
- Water Education Foundation grant
- Project development
- Agriculture outreach
- Pet outreach
- Elementary education

- Student intern labor
- Stormwater staff labor
- University grant

Where activity statistics were available, normalized costs were calculated. Activity statistics were not available for each activity. Therefore, normalization based on total cost was not possible.

Water Quality Monitoring

The total cost of this category was $494,577. Modeling and data analysis accounted for $131,688. Sample collection and lab cost was $303,077 and stormwater staff and student labor cost was $59,812.

Watershed Management

The total cost of this category was $31,591, which was primarily for stormwater staff labor.

References

City of Sacramento. 2003. "Stormwater Management Program 2002/2003 Annual Report"

Table E - 1. Sacramento Costs Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Overall Program										
College Foundation costs		New	12,475.20	Table E-4	4.8%					
BMP handbooks (CASQA)		New	2,500.00	Table E-5	1.0%					
Other constuction element		New	64,778.39	Table E-7, Item 1	24.8%					
Construction inpections		New	181,962.17	Table E-7, Item 2	69.5%	6,375	inspections	Sacramento, 2003b	28.54	$/inspection
Total			261,715.76		5.4%	of total stormwater cost				
Overall Cost Category Normalizations										
total category $ per inspection						6,375	inspections	Sacramento, 2003b	41.05	$/inspection
total category $ per active construction site						417	active construction sites	Sacramento, 2003b	627.62	$/active construction site

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Illegal discharge inspection		New	13,816.15	Table E-7, Item 8	36.8%					
Other iillegal discharge		New	23,690.64	Table E-7, Item 7	63.2%					
Total			37,506.79		0.8%	of total stormwater cost				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
BMP Handbooks (CASQA)		New	2,500.00	Table E-5	5.9%					
Industrial inspections		New	1,823.89	Table E-7, Item 6	4.3%	39	inspections	Sacramento, 2003b	46.77	$/inspection
Other industrial		New	37,993.92	Table E-7, Item 5	89.8%					
Total			42,317.81		0.9%	of total stormwater cost				

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Planning-Bill Crooks	x	New	13,550.00	Table E-2, Item 38	4.8%					
NPDES fee		New	10,000.00	Table E-2, Item 40	3.6%					
Legal Fees	x	New	29,585.00	Table E-2, Item 43	10.5%					
Federal Express		New	110.00	Table E-2, Item 44	0.0%					
Legal Fees	x	New	915.00	Table E-2, Item 45	0.3%					
Petty cash		New	1,527.00	Table E-2, Item 48	0.5%					
Viking office products		New	324.00	Table E-2, Item 51	0.1%					
Annual Reporting-Wendy Alexander	x	New	2,480.00	Table E-2, Item 54	0.9%					
CASQA		New	5,000.00	Table E-2, Item 55	1.8%					
Miscellaneous expenses		New	1,108.00	Table E-2, Item 56	0.4%					
General stormwater activiites		New	52,696.90	Table E-7, Item 3	18.7%					
Program management		New	160,161.19	Table E-7, Item 28	56.9%					
Program management		New	4,044.41	Table E-7, Item 29	1.4%					
Total			281,501.50		5.8%	of total stormwater cost				

Table E-1 continued

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Pump stations		Enhanced	420,000.00	Busath, 2004	12.8%		includes equipment and labor	Busath, pers. comm., 1/12/05		
Street sweeping		Enhanced	1,322,748.02	Table E-6	40.4%	26,450	adjusted curb miles swept	Table E-6	50.01	$/curb mile swept
BMP handbooks (CASQA)		New	2,500.00	Table E-5	0.1%					

Table E – 1. Continued

Field services (drainage system maintenance)		Enhanced	865,672.17	Table E-7	26.5%		equipment estimated below	Busath, pers. comm., 1/12/05		
Water waste activities		New	896.73	Table E-7, Item 27	0.0%					
Other municipal operations		New	9,735.09	Table E-7, Item 15	0.3%					
Equipment (drainage system maintenance)		Enhanced	649,254.13	Busath, 2004	19.8%		calculated as 75% of field services	Busath, pers. comm., 1/12/05		(no backup available)
Total			3,270,806.13		67.9%	of total stormwater cost				

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
New development		New	29,779.10	Table E-7, Item 4	77.3%					
College Foundation costs		New	6,237.60	Table E-4	16.2%					
BMP handbooks (CASQA)		New	2,500.00	Table E-5	6.5%					
Total			38,516.70		0.8%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Develop IPM	x	New	4,710.00	Table E-2, Item 9	1.3%					
Develop IPM	x	New	34,812.00	Table E-2, Item 11	9.6%					
Develop IPM	x	New	577.00	Table E-2, Item 12	0.2%					
Television						201	days	Sacramento, 2003b	331.79	subtotal $/day
Univsion 19	x	New	13,010.00	Table E-2, Item 19	3.6%					
Comcast	x	New	26,284.00	Table E-2, Item 4	7.3%					
KCRA	x	New	24,000.00	Table E-2, Item 6	6.6%					
KXTV	x	New	3,396.00	Table E-2, Item 8	0.9%					
Radio						64	days	Sacramento, 2003b	92.25	subtotal $/day
Clear Channel	x	New	4,374.00	Table E-2, Item 3	1.2%					
KSSJ	x	New	1,530.00	Table E-2, Item 7	0.4%					
Billboards						1	days	Sacramento, 2003b	5,208.00	subtotal $/day
Sign Effects	x	New	2,578.00	Table E-2, Item 16	0.7%					
Brownies	x	New	2,630.00	Table E-2, Item 39	0.7%					
Newspaper						34	days	Sacramento, 2003b	601.32	subtotal $/day
Sac Bee	x	New	736.00	Table E-2, Item 13	0.2%					
Z.C. Optimal Solutions	x	New	18,781.00	Table E-2, Item 22	5.2%					
Sacramento Business Journal	x	New	928.00	Table E-2, Item 23	0.3%					
Mailing						34,488	impressions	Sacramento, 2003b	0.06	subtotal $/impression
Vitali-gage Communic	x	New	1,522.00	Table E-2, Item 21	0.4%					
Auto Mailing		New	653.00	Table E-2, Item 37	0.2%					
Public Event Participation										
Pacific Rim		New	100.00	Table E-2, Item 1	0.0%					
Sac Zoo		New	7,000.00	Table E-2, Item 15	1.9%					
Other Activities										
Wayne Neilsen	x	New	1,717.00	Table E-2, Item 52	0.5%					
Jack Nadel	x	New	10,406.00	Table E-2, Item 5	2.9%					
Safe Designs	x	New	764.00	Table E-2, Item 49	0.2%					
Water ED Found Grant										
Water Edu Found		New	2,500.00	Table E-2, Item 18	0.7%					
Grant		New	2,500.00	Table E-2, Item 10	0.7%					
Project Development										
David John Darold	x	New	1,756.00	Table E-2, Item 42	0.5%					
Lee Pitt	x	New	419.00	Table E-2, Item 46	0.1%					
Linda Taylor	x	New	43.00	Table E-2, Item 47	0.0%					
ATV video Center	x	New	387.00	Table E-2, Item 2	0.1%					
UC Regents	x	New	3,589.00	Table E-2, Item 17	1.0%					
Misc encumbrance		New	15,500.00	Table E-3	4.3%					

Table E – 1. Continued.

Urban creeks		New	750.00	Table E-2, Item 20	0.2%						
Agriculture outreach (cures)		New	2,639.00	Table E-2, Item 34	0.7%						
Pet outreach (doggie bags)		New	4,149.00	Table E-2, Item 35	1.1%						
Elementary Education (sac theatre co)		New	5,100.00	Table E-2, Item 14	1.4%						
Public education		New	93,986.89	Table E-7, Item 9	26.0%						
School outreach		New	23,465.49	Table E-7, Item 10	6.5%						
Landscape grant		New	6,676.64	Table E-7, Item 12	1.8%						
Clean Water Business Partnership		New	2,279.54	Table E-7, Item 13	0.6%						
Grants to agencies within city jurisdiction		New	2,500.00	Table E-2, Item 41	0.7%						
Storm drain stenciling program		New	1,503.76	Table E-7, Item 11	0.4%						
College Foundation costs		New	31,188.00	Table E-4	8.6%						
Total			361,440.32		7.5%	of total stormwater cost					

Table E-1 continued

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Modeling and Data Analysis										
Kathy Russick	x	New	76,017.00	Table E-2, Item 27	15.4%					
LWA	x	New	43,748.00	Table E-2, Item 29	8.8%					
Geosyntec	x	New	4,690.00	Table E-2, Item 32	0.9%					
CSUS foundation		New	7,233.00	Table E-2, Item 31	1.5%					
Implementation: Sample Collection and Lab Analysis										
Aerospeed	x	New	167.70	Table E-2, Item 24	0.0%					
Caltest	x	New	37,197.00	Table E-2, Item 25	7.5%					
County	x	New	247,274.00	Table E-2, Item 26	50.0%					
Kinetic Labs	x	New	2,938.00	Table E-2, Item 28	0.6%					
Project Development		New	15,500.00	Table E-3	3.1%					
General monitoring		New	27,291.38	Table E-7, Item 19	5.5%					
NPDES compliance monitoring		New	9,525.69	Table E-7, Item 20	1.9%					
BMP effectiveness monitoring		New	341.74	Table E-7, Item 21	0.1%					
Special monitoring studies		New	409.30	Table E-7, Item 22	0.1%					
Coordinated monitoring program		New	390.75	Table E-7, Item 23	0.1%					
Coordinated monitoring program		New	368.56	Table E-7, Item 24	0.1%					
Coordinated monitoring program		New	617.52	Table E-7, Item 25	0.1%					
Coordinated monitoring program		New	8,392.24	Table E-7, Item 26	1.7%					
College Foundation costs		New	12,475.20	Table E-4	2.5%					
Total			494,577.08		10.3%	of total stormwater cost				

Watershed Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Acchibald and Wallberg	x	New	9,595.00	Table E-2, Item 33	30.4%					
Brake Pad Patnership		New	2,500.00	Table E-2, Item 36	7.9%					
Watershed stewardship		New	5,565.92	Table E-7, Item 14	17.6%					
Target pollutant		New	13,930.08	Table E-7, Item 18	44.1%					
Total			31,591.00		0.7%	of total stormwater cost				

Total Stormwater Costs	4,819,973.09

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

Table E-2. Source Data Table Submitted by City of Sacramento (cost survey categories added)

Item #	City of Sacramento Category	Cost	Cost Survey Category[1]
	Public Outreach		
1	Pacific Rim	100	Public Education
2	ATV video Center	387	Public Education
3	Clear Channel	4,374	Public Education
4	Comcast	26,284	Public Education
5	Jack Nadel	10,406	Public Education
6	KCRA	24,000	Public Education
7	KSSJ	1,530	Public Education
8	KXTV	3,396	Public Education
9	Mark McCarthy	4,710	Public Education
10	Grant	2,500	Public Education
11	Ogilvy	34,812	Public Education
12	Rooney Design	577	Public Education
13	Sac Bee	736	Public Education
14	Sac Theater Co	5,100	Public Education
15	Sac Zoo	7,000	Public Education
16	Sign Effects	2,578	Public Education
17	UC Regents	3,589	Public Education
18	Water Edu Found	2,500	Public Education
19	Univision 19	13,010	Public Education
20	Urban Creeks	750	Public Education
21	Vitali-gage Communic	1,522	Public Education
22	Z.C. Optimal Solutions	18,781	Public Education
23	Sac Business Jour	928	Public Education
	Monitoring		
24	Aerospeed	168	Monitoring
25	Caltest	37,197	Monitoring
26	County	247,274	Monitoring
27	Kathy Russick	76,017	Monitoring
28	Kinetic Labs	2,938	Monitoring
29	LWA	43,748	Monitoring
30	Sequoia Analytical	0	
31	CSUS foundation	7,233	Monitoring
32	Geosyntec	4,690	Monitoring

Table E-2. Continued.

	Target Pollutant		
33	Acchibald and Wallberg	9,595	Watershed
34	Cures	2,639	Public Education
35	Doggie Bags	4,149	Public Education
36	Brake Pad Patnership	2,500	Watershed
	Misc		
37	Auto Mailing	653	Public Education
38	Bill Crooks	13,550	Management
39	Brownies	2,630	Public Education
40	NPDES fee	10,000	Management
41	CSUS	2,500	Public Education
42	David John Darold	1,756	Public Education
43	Downey Brand	29,585	Management
44	Fedex	110	Management
45	George & Shapiro	915	Management
46	Lee Pitt	419	Public Education
47	Linda Taylor	43	Public Education
48	Petty cash	1,527	Management
49	Safe Designs	764	Public Education
50	BMP handbooks	10,000	See Table E-5
51	Viking Office Prods	324	Management
52	Wayne Neilsen	1,717	Public Education
53	Misc encumbrance	31,000	See Table E-3
54	Wendy Alexander	2,480	Management
55	CASQA	5,000	Management
56	Misc Expenses	1,108	Management
	Students		
57	College Foundation	62,376	See Table E-4
	Total	786,175	

(Source: Busath, pers. comm., 11/21/03)

1. Cost Categories Abbreviated According to the Following:
   - Construction: Construction Site Stormwater Runoff Control
   - Illicit Discharge: Illicit Discharge Detection and Elimination
   - Industrial: Industrial and Commercial Management Programs
   - Management: Overall Stormwater Program Management
   - Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
   - Post Construction: Post Construction Water Management in New Development and Redevelopment
   - Public Education: Public Education, Outreach, Involvement, and Participation
   - Monitoring: Water Quality Monitoring
   - Watershed: Watershed Management

Table E-3. Distribution of Miscellaneous Encumbrance Between Public Education and Monitoring

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
31,000.00	Table 2, Item 53	50%	Public Education	Busath, pers. comm., 1/22/04	15,500.00
31,000.00	Table 2, Item 53	50%	Monitoring	Busath, pers. comm., 1/22/04	15,500.00
Total		100%			31,000.00

Table E-4. Distribution of College Foundation Costs for Student Internship Program

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
62,376.00	Table E-2, Item 57	50%	Public Education	Busath, pers. comm., 1/22/04	31,188.00
62,376.00	Table E-2, Item 57	20%	Construction	Busath, pers. comm., 1/22/04	12,475.20
62,376.00	Table E-2, Item 57	20%	Monitoring	Busath, pers. comm., 1/22/04	12,475.20
62,376.00	Table E-2, Item 57	10%	Post Construction	Busath, pers. comm., 1/22/04	6,237.60
Total		100%			62,376.00

Table E-5. Distribution of BMP Handbooks (CASQA) between Industrial, Municipal, New Development, and Construction

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
10,000.00	Table E-2, Item 50	25%	Industrial/Commercial	Busath, pers. comm., 1/22/04	2,500.00
10,000.00	Table E-2, Item 50	25%	Municipal	Busath, pers. comm, 1/22/04	2,500.00
10,000.00	Table E-2, Item 50	25%	Post Construction	Busath, pers. comm, 1/22/04	2,500.00
10,000.00	Table E-2, Item 50	25%	Construction	Busath, pers. comm, 1/22/04	2,500.00
Total		100%			10,000.00

Table E-6. Calculation of Street Sweeping Cost

Description	Dollar Amount of Statistic	Reference
Actual Cost	1,600,000.00	Busath, pers. comm., 1/22/04
monthly req. miles	2,200	Sacramento, 2003b
6/year req. miles	0	Sacramento, 2003b
1/year req. miles	50	Sacramento, 2003b
annual required	26,450	Calculation
monthly actual est. mi.	2,662	Busath, pers. comm., 1/22/04
6/year actual est. mi.	0	Sacramento, 2003b
1/year actual est. mi.	50	Sacramento, 2003b
annual actual est. mi.	31,994	Calculation
annual req. cost est.	1,322,748.02	Calculation

Table E-7. Labor Allocations for Sacramento Categories with Corresponding Cost Survey Categories

Item #	Sacramento Category	City Labor Code	Labor Cost	Cost Survey Category
1	Construction Element	HA	64,778.39	Construction
2	Construction Inspections	HA1	181,962.17	Construction
3	General Stormwater Actvities	HAA	52,696.90	Management
4	New Development Element	HB	29,779.10	Post Construction
5	Industrial Element	HC	37,993.92	Industrial
6	Industrial Inspection	HC1	1,823.89	Industrial
7	Illegal Discharge Program	HD	23,690.64	Illicit Discharge
8	Illegal Discharge Inspection	HD1	13,816.15	Illicit Discharge
9	Public Education Program	HE	93,986.89	Public Education
10	School Outreach Program	HE1	23,465.49	Public Education
11	Stormdrain Stenciling Program	HE2	1,503.76	Public Education
12	NN Landscape Grant	HE3	6,676.64	Public Education
13	CWBP	HE4	2,279.54	Public Education
14	Watershed Stewardship	HF	5,565.92	Watershed
15	Municipal Operations	HG	9,735.09	Pollution Prevention
16	Plant Services Stormwater Activities	HH	22,552.19	See Table E-1, pump stations
17	Field Services Stormwater Activities	HI	865,672.17	Pollution Prevention
18	Target Pollutant	HJ	13,930.08	Watershed
19	Monitoring	HK	27,291.38	Monitoring
20	NPDES Compliance Monitoring	HK1	9,525.69	Monitoring
21	BMP Effectiveness Monitoring	HK2	341.74	Monitoring
22	Special Monitoring Studies	HK3	409.30	Monitoring
23	Coordinated Monitoring Program	HK4	390.75	Monitoring
24	Coordinated Monitoring Program	HK5	368.56	Monitoring
25	Coordinated Monitoring Program	HK6	617.52	Monitoring
26	Coordinated Monitoring Program	HK7	8,392.24	Monitoring
27	Water Waste Activities	HL	896.73	Pollution Prevention
28	Program Management	HM	160,161.19	Management
29	Program Management	PM	4,044.41	Management
	Total		1,664,348.44	

(Source: Table E-8)

Table E-8. Labor Cost Data as Submitted by City of Sacramento Staff

City of Sacramento
Department of Utilities
Project Accounting Management System (PAMS)

Job #	Description	Org	Rept Catg	Total Employee Expense	Indiv Hourly Expense
21233	NPDES PROGRAM	3322	HH	665.49	95.1
		3323	HH	4,122.06	64.4
			HH	1,410.18	58.8
			HH	3,508.67	48.7
			HH	1,944.98	44.2
			HH	1,766.04	31.5
			HH	1,124.38	70.3
			HA1	108,293.85	63.9
			HH	868.3	64.3
			HH	1,023.82	64
			HH	930.52	58.2
			HH	198.42	49.6
			HH	448.59	64.1
			HH	384.49	64.1
			HH	656.76	41
			HH	283.2	35.4
			HH	1,122.86	70.2
		3331	HH	2,009.09	24.8
			HH	84.34	42.2
			HA	2,371.26	25.9
			HA1	6,658.08	26.4
			HAA	2,949.16	26.4
			HAA	1,463.31	41.8
			HD	49.61	24.8
			HE	655.9	25.7
			HE1	1,916.75	26.1
			HE2	417.95	26.1
			HF	99.23	24.8
			HK	244.3	27.1
			HK3	198.43	24.8
		3332	HAA	6,475.21	89.9
			HE	2,116.34	90.1
			HE1	1,461.61	89.5
			HG	8,302.14	90.2
			HJ	11,187.93	89.6

Table E-8. Continued.

		HK	17,265.87	89.4
		HK1	4,597.83	89
		HK2	162.9	89
		HK4	266.5	88.8
	3333	HK5	368.56	0
		HK6	617.52	65
		HK7	8,392.24	88.8
21233	NPDES PROGRAM	3333 HA	7,712.62	61.2
		HA	52,918.39	89
		HA	1,776.12	44.4
		HA1	5,602.74	62.3
		HA1	61,407.50	43.6
		HAA	12,504.88	61.9
		HAA	13,331.24	66.7
		HAA	12,627.60	89.2
		HAA	3,345.50	65
		HB	4,303.02	62.4
		HB	25,476.08	88.5
		HC	1,745.21	62.3
		HC	35,847.63	66.5
		HC	401.08	89.1
		HC1	248.44	62.1
		HC1	1,575.45	65.6
		HD	23,193.44	66.6
		HD	447.59	89.5
		HD1	13,816.15	68.2
		HE	11,310.88	62.3
		HE	156.04	62.4
		HE	928.86	88.5
		HE	78,818.87	69.4
		HE1	4,083.84	67.5
		HE1	4,279.00	89.1
		HE1	11,724.29	67.6
		HE2	1,085.81	67.9
		HE3	6,676.64	65.5
		HE4	2,279.54	67.4
		HF	62.43	62.4
		HF	987.49	89.8
		HF	4,416.77	63.1
		HG	1,164.59	68.5
		HG	268.36	89.5
		HJ	1,133.19	100.7
		HJ	1,608.96	67
		HK	804.75	100.6
		HK	1,499.54	68.2
		HK	7,266.64	89.2

Table E-8. Continued.

		HK	210.28	70.1
		HK1	4,927.86	55.7
		HK2	178.84	89.4
21233	NPDES PROGRAM	3333 HK3	210.87	38.3
		HK4	124.25	62.1
		HL	800.31	66.7
		HL	96.42	48.2
		HM	160,070.30	100.4
		HM	90.89	29.5
		PM	4,044.41	101.1
		3342 HI	1,440.10	53.3
		3343 HI	2,252.63	56.3
		HI	205.78	51.4
		HI	16,387.75	46.6
		HI	29,009.49	45.6
		HI	53,108.99	54.6
		HI	945.65	43
		HI	2,059.16	51.5
		HI	1,486.70	41.3
		HI	46,709.55	50
		HI	60,251.76	55.9
		HI	421.01	52.6
		HI	23,368.00	44.3
		HI	11,685.67	46.6
		HI	24,722.55	44
		HI	1,420.81	52.6
		HI	1,197.95	33.3
		HI	33,694.50	48.8
		HI	25,045.38	42.7
		HI	12,318.28	50.3
		HI	15,905.71	44.8
		HI	28,123.15	56
		HI	43,011.80	55.8
		HI	77,791.72	49.9
		HI	6,085.05	56.9
		HI	89,605.65	62.8
		HI	84,737.98	55.3
		HI	2,041.63	51
		HI	4,134.41	51.7
		HI	61,389.23	40.7
		HI	510.55	63.8
		HI	22,888.86	48.5
		HI	1,291.63	47.8
		HI	80,423.09	54.1
		Total	1664348.44	59.92

(Source: Busath, pers. comm., 11/21/03)

The backup calculations for the cost for each cost survey category in Section 8 and the sources of the cost data are presented in this appendix. Tables are generally presented by sequentially increasing levels of detail. Figure F-1 illustrates how data is shared throughout the tables.

Table F-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 8, Table 8-2. The remaining tables (F-2 through F-7) present the detailed back-up information for the numbers in Table F-1. Table F-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table F-2. Item numbers corresponding to the subtotals in Table F-2 were added to the left hand column to easily show how the numbers are pulled forward to Table F-1. The right hand column in Table F-2 was added to show how costs were allocated to the cost survey categories. Table F-1 entries that were not taken directly from Table F-2 are found in Tables F-3 through F-7.

For the city of Santa Clarita, labor costs of the stormwater staff are not distributed among the various survey categories. Instead, it is all captured under Overall Stormwater Program Management. Thus, comparing costs with other municipalities where such costs are distributed, Santa Clarita's Overall Stormwater Management Program costs will be higher.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

Construction Site Stormwater Runoff Control

The total cost of this category was $74,995. The only cost attributed to this category was for inspections. The city conducted 11,746 inspections, but this number reflects multiple inspections for various construction activities at the same site (Santa Clarita, 2003b). Since this number does not solely represent stormwater inspections, this should be considered when comparing these inspection statistics with that of the other cities. Therefore, cost was normalized per active construction site (64) (Santa Clarita, 2003b). Other activities in this category included:

- Development of pollution prevention handouts directly related to specific construction functions
- The city's Environmental, Building and Safety, and Public Works inspectors completed site visits on a daily basis
- Cited contractors in the event of illicit connection detection

Santa Clarita

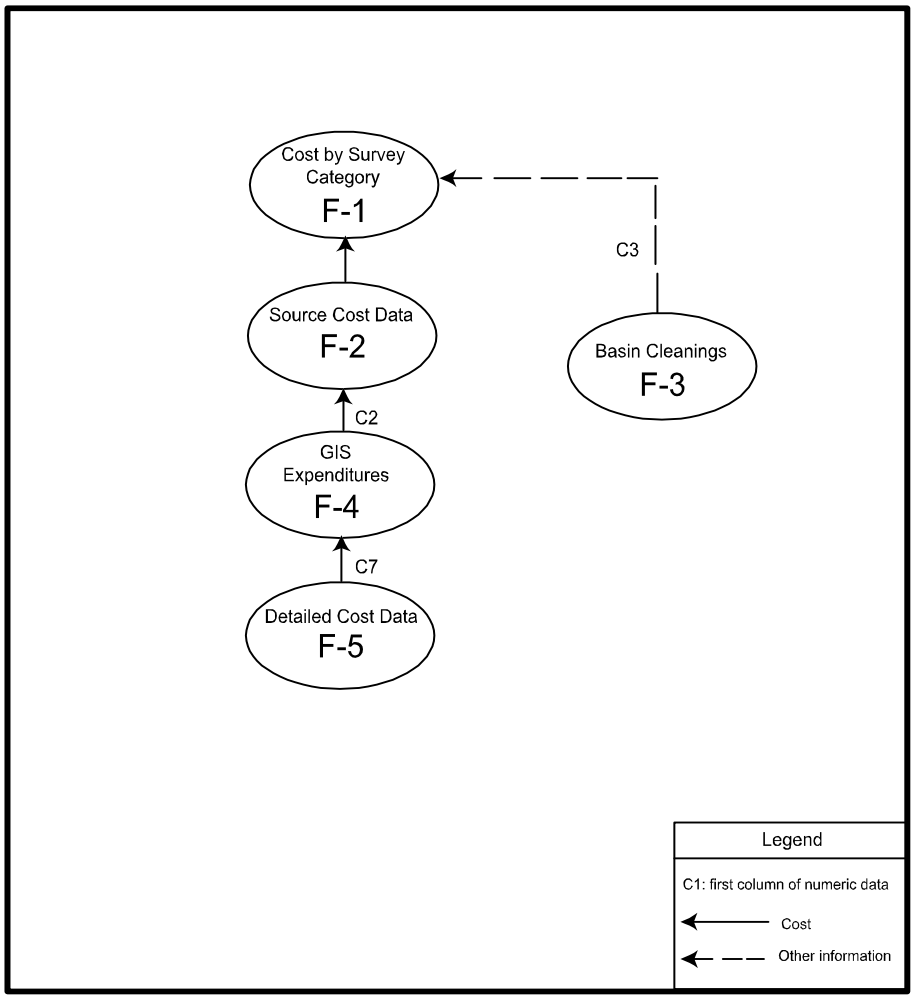

Figure F-1. Santa Clarita Flowchart

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $114,831. Though the city labeled this cost as operation and maintenance activities, activities were specific to identification and elimination of illicit connections and discharges.

The Los Angeles Flood Control District (LAFCD) owns and maintains 122,354 feet of open channel all of which was screened for illicit connections during the 2002/03 fiscal year. Out of the 20 illicit connections that were identified by screening, all were investigated, terminated, removed, and resulted in enforcement action (Santa Clarita, 2003b).

Also, 349 illicit discharges were reported. Of these, 291 were discontinued/cleaned up voluntarily through enforcement and the source identified, 2 were cleaned up with no source identified, 50 resulted in no evidence of discharge, 27 were determined to be conditionally

exempt, and 305 resulted in enforcement action. (Santa Clarita, 2003b). Normalized cost is $311 per investigation of both illicit connections and illicit discharges (20+349). This includes all associated follow up activities performed by the city as described above.

Industrial and Commercial Management Programs

The total cost of this category was $12,600. The only cost for this category was for inspection of industrial and commercial facilities. The city inspection staff performed 110 inspections during 2002/03. The city of Santa Clarita contracts with Los Angeles County of perform these inspections but are done by city staff (Cramer, pers. comm., 4/22/04). Enforcement actions were issued which included 17 verbal warnings and 4 notices to comply. (Santa Clarita, 2003b).

Overall Stormwater Program Management

The total cost for this category was $515,352. These costs are for administrative activities and development planning. Stormwater staff time (including overhead allocation) used to oversee or implement the activities in the other cost categories accounted for $438,832. Overhead allocation (other supporting city functions, building, etc.) was $253,073. This number is described in the footnote to Table F-2. Development planning cost was $76,520. These costs were for activities the city does to insure developers are following SUSMP[1] standards. Maintenance of the stormwater section of city's website was also performed.

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost for this category was $859,754. Activities performed in this category were for catch basin cleaning, trash pick-up, and street sweeping. The cost attributed to catch basin cleaning was $251,908. During 2002/03, 1,482 catch basins were cleaned (Table F-3). The cost attributed to street sweeping was $557,443. The city sweeps all streets once a week (Santa Clarita, 2003b). A total of 900 curb miles were swept per week in 2002/03 (Cramer, pers. comm., 4/22/04). Trash pick-up costs were $50,403 for the household hazardous waste program.

Post Construction Stormwater Management in New Development and Redevelopment

The adjusted cost of this category was $106,925. The total cost for this category submitted by the city of Santa Clarita was $256,950. Of the cost, $97,813 was for vehicles for catch basin cleaning (Cramer, pers. comm., 4/22/04). These capital costs were recurring for other projects at an unknown interval and were assumed to be annual for the purposes of this survey. The remaining $9,112 was for maintenance and conveyance of one detention basin (Cramer, pers. comm., 4/22/04).

[1] SUSMP: Standard Urban Storm Water Mitigation Plans (SUSMPs) are often referenced by permits. They set treatment requirements for new construction and redevelopment. (www.swrcb.ca.gov)

Public Education and Outreach and Public Involvement and Participation

The total cost for these categories was $49,130. These categories were combined for the city of Santa Clarita. This cost includes employee training to administer these categories. Activities in this category included:

- Storm drain stenciling: Out of the city owned 440 drain inlets, 45 were marked with a no dumping message
- Maintained stormwater hotline: The city received approximately 30 calls per day relating to trash, household hazardous waste, and stormwater (Cramer, pers. comm., 4/22/04)
- Print, television, radio, and other media: Approximately 5 million impressions were made (for the entire permitted area). A breakdown for Santa Clarita was not available
- School outreach: An environmental mascot visited schools and public events to educate attendees on stormwater issues. Children's activity books were distributed at appearances. Flyers were distributed to promote the River Rally event
- Cooperated with the principal permittee to develop specific outreach programs to target pollutants in their area
- Distributed pollutant-specific materials
- Developed and distributed brochures and door hangers to specific residents
- Attended 4 workshop/community events to discuss stormwater pollution

Programs supported by the principal permittee were funded in part by a contribution from the city of Santa Clarita in the amount of $45,822. The remaining activities were performed by stormwater staff and that cost breakdown was not available.

Water Quality Monitoring

The total cost of this category was $3,300 (Table F-2). This included monitoring for diazinon multiple times at one site (Cramer, pers. comm., 4/22/04).

Watershed Management

The total cost of this category was $332,949. This cost was allocated to this category based on estimates from city staff. The staff estimated that 50 percent of GIS cost was attributable to stormwater activities (Table F-4).

References

City of Santa Clarita. 2003. "Los Angeles County Municipal Storm Water Permit (Order 01-182) Individual Annual Reporting Form, Attachment U-4"

Table F - 1. Santa Clarita Cost Organized by Cost Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Construction inspections		New	74,995.00	Table F-2, Item 9	100%	64	active construction sites	Santa Clarita, 2003b	1,171.80	$/active construction site
Total			74,995.00		3.6%	of total stormwater cost				

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Operations and maintenance		New	114,831.05	Table F-2, Item 16	100%	369	investigations	Santa Clarita, 2003b	311.20	$/investigation
Total			114,831.05		5.5%	of total stormwater cost				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Industrial/Commercial site visit activities		New	12,600.00	Table F-2, Item 7	100%	110	inspections	Santa Clarita, 2003b	114.55	$/inspection
Total			12,600.00		0.6%	of total stormwater cost				

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Administrative costs		New	438,832.00	Table F-2, Item 1	85.2%					
Development planning		New	76,519.55	Table F-2, Item 8	14.8%					
Total			515,351.55		24.9%	of total stormwater cost				

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Catch basin cleaning		Enhanced	251,907.99	Table F-2, Item 12	29.3%	1,482	basin cleanings	Table F-3	169.98	$/basin cleaning
Trash pick-up		Existing	50,402.55	Table F-2, Item 13	5.9%					
Street sweeping		Enhanced	557,443.16	Table F-2, Item 11	64.8%	46,800	curb miles swept	Cramer, pers. comm., 4/22/04	11.91	$/curb mile swept
Total			859,753.70		41.5%	of total stormwater cost				

Table F – 1. Continued.

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
BMP maintenance		New	9,111.93	Table F-2, Item 10	8.5%					
Capital costs		New	97,813.00	Table F-2, Item 14	91.5%					
Total			106,924.93		5.2%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Public education and outreach		New	45,821.98	Table F-2, Item 3	93.3%					
Employee training		New	3,308.39	Table F-2, Item 4	6.7%					
Total			49,130.37		2.4%	of total stormwater cost				

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Monitoring		New	3,300.00	Table F-2, Item 18	100%					
Total			3,300.00		0.2%	of total stormwater cost				

Watershed Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Watershed management		New	332,949.00	Table F-2, Item 19	100%					
Total			332,949.00		16.1%	of total stormwater cost				

Total Stormwater Costs	2,069,835.60

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

Table F-2. Source Data Table Submitted by City of Santa Clarita in their Annual Report Form for Los Angeles County Municipal Stormwater Permit (cost survey categories added)

Item #	City of Santa Clarita Category	Cost	Cost Survey Category[1]
	Program Mangement		
1	Administrative Costs	438,832.00 [2]	Management
2	Capital Costs	0.00	
	Public Information and Participation		
3	Public Outreach/Education	45,821.98	Public Education
4	Employee Training	3,308.39	Public Education
5	Corporate Outreach	0.00	
6	Business Assistance	0.00	
7	Industrial/Commercial Inspection/Site Visit Actvities	12,600.00	Industrial
8	Development Planning	76,519.55	Management
	Development Construction		
9	Construction Inspections	74,995.00	Construction
	Public Agency Activities		
10	Maintenance of structural and treatment control BMPs	9,111.93	Post Construction
11	Municipal Street Sweeping	557,443.16	Pollution Prevention
12	Catch Basin Cleaning	251,907.99	Pollution Prevention
13	Trash Collection/Recycling	50,402.55	Pollution Prevention
14	Capital Costs	97,813.00 [3]	Post Construction
15	Other	0.00	
	IC/ID Program		
16	Operations and Maintenance	114,831.05	Illicit Discharge
17	Capital Costs	0.00	
18	Monitoring	3,300.00	Monitoring
19	Other (Watershed Management)	332,949.00 [4]	Watershed
	Total	2,069,835.60	

(Source: Santa Clarita 2003b)

1. Cost Categories Abbreviated According to the Following:
   Construction: Construction Site Stormwater Runoff Control
   Illicit Discharge: Illicit Discharge Detection and Elimination
   Industrial: Industrial and Commercial Management Programs
   Management: Overall Stormwater Program Management
   Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
   Post Construction: Post Construction Water Management in New Development and Redevelopment
   Public Education: Public Education, Outreach, Involvement, and Participation
   Monitoring: Water Quality Monitoring
   Watershed: Watershed Management

2. Cost reported in the annual report form was $184,710. Per personal communication with Dan Smith, this number was adjusted up to $185,759 because of $1,049 in previously unallocated labor for stormwater staff. Another $253,073 was also added as the cost of overhead allocation. Overhead allocation was not included in the annual report and it pays for support by other departments such a payroll, human resources, etc. as well as a fraction of building costs.

3. $137,784 was adjusted down to $97,813 after a more thorough review by city finance staff. The city suggested we add $150,025 for the curb line and gutter maintenance program, but this cost could not be established as a stormwater compliance cost.

4. From Table 7-3.

Table F-3. Calculation of Number of Basin Cleanings

Type	Number	Reference	Frequency (yearly)	Reference	Total Cleanings
Priority A	65	Santa Clarita, 2003b	3	Santa Clarita, 2003b	195
Priority B	180	Santa Clarita, 2003b	3	Santa Clarita, 2003b	540
Priority C	249	Santa Clarita, 2003b	3	Santa Clarita, 2003b	747
Total	494				1,482

Table F-4. Calculation of GIS Expenditures Relating to Stormwater

Amount	Source	Percent Allocation	Category	Reference	Allocated Cost
665,897.12	Table F-5	50%	Watershed Management	Cramer, pers. comm., 6/9/04	332,948.56
665,897.12	Table F-5	50%	Not Related to Stormwater	Cramer, pers. comm., 6/9/04	332,948.56
Total		100%			665,897.12

Table F-5. Financial Cost Data Submitted by City of Santa Clarita

STORMWATER UTILITY FINANCIAL PROJECTIONS
Financial History

		1996-97 Actuals	1997-98 Actuals	1998-99 Actuals	1999-00 Actuals	2000-01 Actuals	2001-02 Actuals	2002-03 Actuals
REVENUES:								
	User Fee	1,847,538	2,149,920	2,527,683	1,925,118	2,101,130	1,954,966	2,251,307
	(Supplemental Refund)							
	Interest Income	42,104	58,193	79,913	86,125	143,197	96,382	81,505
	Misc. Revenues		103	1,811			103,285	147,464
	Sale of Maps & Publications			140	1,792	1,696	2,597	1,929
	Operating Transfers In			53,633	125,028	277,836	323,142	289,765
Total Revenues		**1,889,642**	**2,208,216**	**2,663,179**	**2,138,063**	**2,523,859**	**2,480,373**	**2,771,971**
OPERATING EXPENDITURES:								
2314	GIS	965,352	327,471	213,712	232,334	486,642	504,794	665,897
4311	Stormwater Engineering				56,652	17,924		
5720	Stormwater Utility Admin		312,673	323,391	691,677	539,508	1,561,987	554,823
5740	Stormwater Field Activities	572,534	601,604	627,845	688,919	740,401	994,760	928,992
8140	Stormwater Attorney Services							
	Transfers Out							
	Overhead Allocation - 11% of Rev	197,820	197,820	197,820	197,820	197,820	203,895	253,073
	Audit Adj - AR Allowance							
TOTAL OPERATING EXPENDITURES		**1,735,706**	**1,439,567**	**1,362,768**	**1,867,401**	**1,982,295**	**3,265,435**	**2,402,785**
CAPITAL PROJECTS:								
	1996-97 Access Ramp	0	18,636	6,364				
	1997-98 Curb Gutter & Flowline			115,000				
	1999-00 Stormdrain Repairs					0		
	1999-00 Curb Gutter Flowline				157,415			
	Storm Drain Repairs			(97,660)	110,170	17,500		
M0031	Annual Curb Gutter Flowline						151,766	
M0032	Storm Drain Transfer Program						73,428	316,215
M0037	Annual Curb Gutter Flowline			190,668				150,025
	Water Discharge Retrofit			16,683				
	Galeton Street Improvements			18,850				
	2000-01 Curb Gutter Flowline					177,000		
	Annual Stormdrain Repairs					0		
TOTAL CAPITAL PROJECTS		**0**	**18,636**	**249,905**	**267,585**	**194,500**	**225,194**	**466,240**
Total Expenditures		**1,735,706**	**1,458,203**	**1,612,673**	**2,134,987**	**2,176,795**	**3,490,629**	**2,869,025**
EXCESS (DEFICIENCY) REVENUES OVER		**153,936**	**750,013**	**1,050,506**	**3,077**	**347,065**	**(1,010,256)**	**(97,054)**
FUND BALANCE - BEGINNING OF YEAR		**$ 898,435**	**$ 1,052,371**	**$ 1,802,383**	**$ 2,852,890**	**$ 2,855,966**	**$ 3,203,031**	**$ 2,192,775**
FUND BALANCE - END OF YEAR		**$ 1,052,371**	**$ 1,802,383**	**$ 2,852,890**	**$ 2,855,966**	**$ 3,203,031**	**$ 2,192,775**	**2,095,721**
Reserve For Vehicle Replacement				**47,998**	**65,183**	**83,039**	**115,776**	**175,000**
C.	**RECEIVABLE - NON PAYING CUSTOMERS**						**$ 84,658**	
D.	**REMAINING SCHOOL RECEIVABLES**						**$ 535,611**	
Unreserved Fund Balance		**$ 1,052,371**	**$ 1,802,383**	**$ 2,804,892**	**$ 2,790,783**	**$ 3,119,992**	**$ 1,456,730**	**$ 1,920,721**

Section G-1 of this appendix contains backup calculations for certain results in Section 9 and additional cost analysis that did not prove useful, but is presented here to demonstrate their lack of utility (Section G-1). This is particularly true of regressions of normalized cost versus cost factors. Section G-2 of this appendix contains analysis of future cost to compare various cost scenarios using equivalent annual cost.

To compare costs from years greater than a year different from the year of this study (2003 dollars), the Consumer Price Index Urban (CPIU) was used (U.S. Bureau of Labor Statistics, 2005). CPIU was used because it is a common measure of inflation, it was similar to the Engineering News Review Construction Cost Index (CCI) from the Engineering News Record (ENR), yet CPIU reflects more broadly on how inflation than the CCI. As an example of similarity between the two indices, the CPIU adjustment factor from 1998 to 2003 agreed with the CCI to three significant figures. Because CPIU was similar to the ENR CCI and for consistency, CPIU was used to adjust both construction costs (e.g. treatment plant) and city stormwater costs that fund mostly non-construction activities such as inspection programs and maintenance of city infrastructure.

G.1 COST SURVEY ANALYSIS

This section contains costs normalized by both number of households and population. Since cost per households is the most common in the literature, several regressions against this parameter are also presented in this section.

Survey Category Costs per Household

Table G-1 presents survey category costs normalized by households.

Table G-1. Survey Category Costs Per Household

	Const.	IDDE	Ind/Com	Overall Man.	Pollution Prevention	Post. Con.	Pub. Ed.	Mon.	W. Man.
Entity	$/HH	$/HH	$/HH	$/HH	$/HH	$/HH	$/HH	$/HH	$/HH
City of Corona	1.36	0.53	2.29	8.09	18.34	0.34	0.72	0.18	0.00
City of Encinitas	7.12	2.07	2.75	5.38	22.16	0.64	1.76	3.20	0.52
City of Fremont	0.26	0.09	3.02	6.54	30.64	0.51	1.46	1.89	0.25
Fresno-Clovis Area	0.42	0.07	0.24	2.92	11.47	0.29	1.08	1.29	0.00
City of Sacramento	1.60	0.23	0.26	1.72	21.41	0.23	2.20	3.02	0.19
City of Santa Clarita	1.43	2.19	0.24	9.83	16.39	2.04	0.94	0.06	6.35
Average	2.03	0.86	1.47	5.74	20.07	0.68	1.36	1.61	1.22
Median	1.39	0.38	1.27	5.96	19.88	0.42	1.27	1.59	0.22
Minimum	0.26	0.07	0.24	1.72	11.47	0.23	0.72	0.06	0.00
Maximum	7.12	2.19	3.02	9.83	30.64	2.04	2.20	3.20	6.35

Survey Category Costs Per Capita

Table G-2 presents survey category costs normalized by population.

Table G-2. Survey Category Costs Per Capita

	Const.	IDDE	Indust.	Overall Man.	Pollution Prevent.	Post. Con.	Pub. Ed.	Mon.	W. Man.
	$/capita								
City of Corona	0.43	0.17	0.72	2.54	5.76	0.11	0.23	0.06	0.00
City of Encinitas	2.93	0.85	1.13	2.21	9.11	0.26	0.72	1.31	0.21
City of Fremont	0.09	0.03	1.03	2.23	10.46	0.17	0.50	0.65	0.09
Fresno-Clovis Area	0.15	0.02	0.09	1.02	3.99	0.10	0.38	0.45	0.00
City of Sacramento	0.64	0.09	0.10	0.69	8.04	0.09	0.89	1.22	0.08
City of Santa Clarita	0.50	0.76	0.08	3.41	5.69	0.71	0.33	0.02	2.20
Average	0.79	0.32	0.53	2.02	7.27	0.24	0.51	0.62	0.43
Median	0.46	0.13	0.41	2.22	7.19	0.14	0.44	0.55	0.08
Minimum	0.09	0.02	0.08	0.69	3.99	0.09	0.23	0.02	0.00
Maximum	2.93	0.85	1.13	3.41	10.46	0.71	0.89	1.31	2.20

Construction Program Cost Normalizations

Table G-3 presents construction program costs normalized by several cost factors. In some cases, activity statistics were not available and, as such, normalization was not possible. In such instances, the average and median statistics are only based on the data available. Construction costs were normalized by number of active construction sites and inspections. The large variability in normalized cost may be a result of inconsistent reporting of these cost factors.

Table G-3. Construction Program Unit Costs

Entity	Construction Cost	Active Sites	Construction $/active site	Inspections	Construction $/inspection
City of Corona	53,382	41	1,302	564	95
City of Encinitas	169,751	40	4,244	401	423
City of Fremont	17,715	24	738	197	90
Fresno-Clovis Area	81,800	N/A	N/A	N/A	N/A
City of Sacramento	261,716	417	628	6,375	41
City of Santa Clarita	74,995	64	1,172	N/A	N/A
Average			1,617		162
Median			1,172		92

Industrial and Commercial Program Cost Normalizations

Table G-4 presents industrial and commercial program costs normalized by several cost factors. In some cases, activity statistics were not available and as such, normalization was not possible. In such instances, the average and median statistics are only based on the data available. Industrial and commercial program costs were normalized by population, number of industrial and commercial sites, and number of inspections.

Table G-4. Industrial and Commercial Program Units

Entity	Program Cost	Sites	Industrial $/site	Inspections	Industrial $/inspection
City of Corona	89,916	3,050	29	600	150
City of Encinitas	65,596	417	157	266	247
City of Fremont	210,027	1,028	204	482	436
Fresno-Clovis Metropolitan Area	47,780	N/A	N/A	N/A	N/A
City of Sacramento	42,318	N/A	N/A	39	N/A
City of Santa Clarita	12,600	1,071	12	110	115
Average			101		406
Median			93		247

Additional Regression Analysis

Many of the following regressions have outer and inner confidence limits. Though practically useless, they are displayed to indicate how much inaccuracy results from the regressions. The inner limits are the 90 percent confidence interval for the mean cost from the total population of

"good" stormwater programs in California. The outer limits are the 90 percent confidence interval for cost of any one "good" California stormwater program.

Mean personal income appears to be the best indicator of total cost per household, but as a model not very useful because the predicted value nearly doubles when considering the confidence limits. Cost per household versus mean personal income is displayed in Figure G-1.

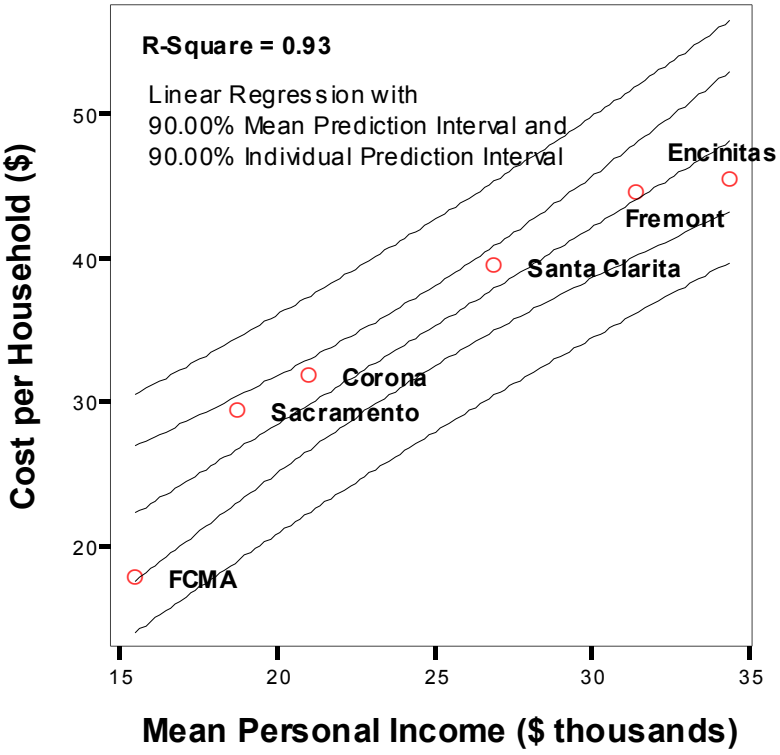

Figure G-1. Cost Per Household versus Mean Personal Income

In the regression of total cost per household verses income per household the theory is that the more money households bring in, the more a city would be able to collect for stormwater activities. However, this may not indicate more is accomplished because of higher cost for areas of higher income may limit how much can be accomplished. Cost per household versus mean household income is displayed in Figure G-2.

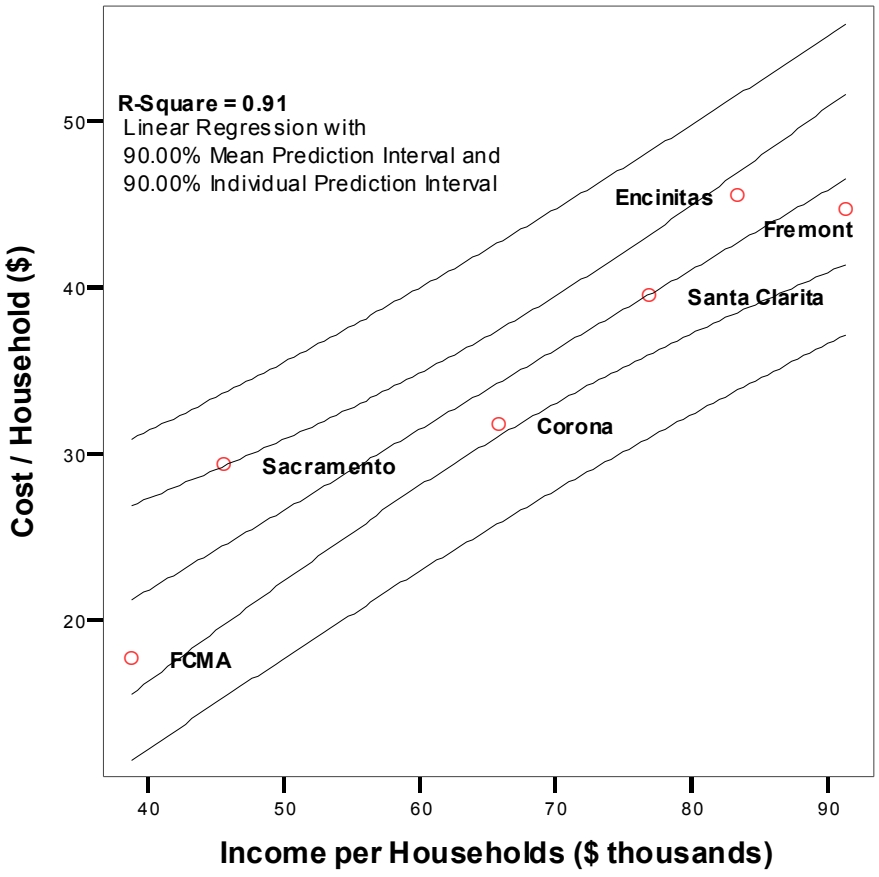

Figure G-2. Cost Per Household verses Income Per Household

As graphically demonstrated in Figure G-3, Fremont and Corona costs are particularly not well behaved in the regression of cost per household verses population. The conclusion is that city size is not a good predictor of stormwater cost per household (this is also discussed in Section 9.1). This is also demonstrated by the regression in Figure G-7.

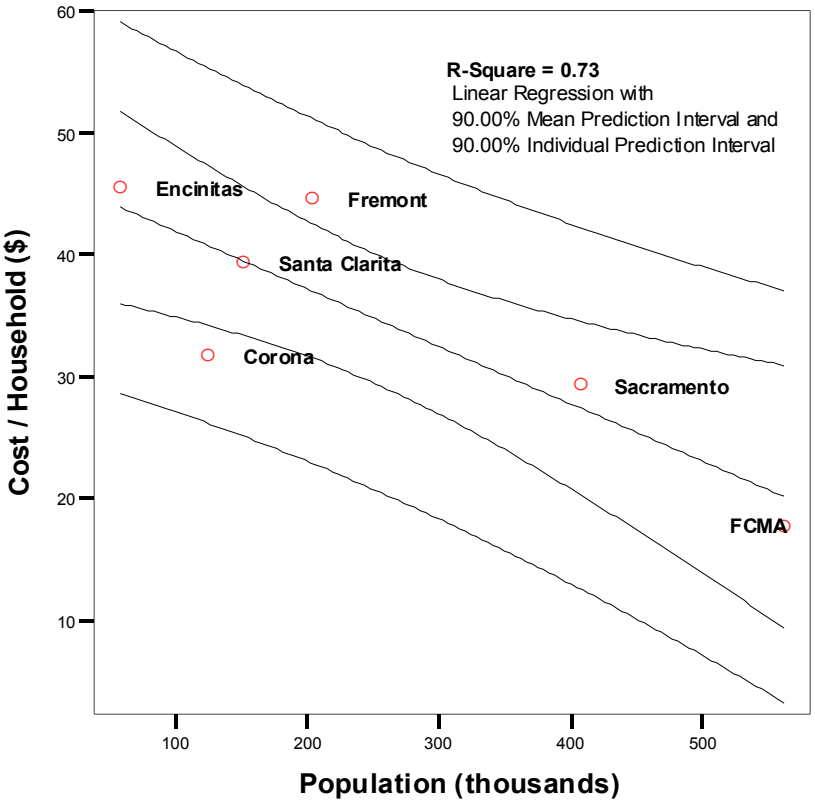

Figure G-3. Cost Per Household verses Population

Figures G-4 through G-7 show regressions using cost factors that are not useful in explaining costs. They are presented because there was some logic that they may be useful, and perhaps with more data they may prove to be helpful in more complicated models. However, they do not seem as important as the factors discussed qualitatively in Section 9.2 of the report. Each factor-years since incorporation, rainfall, income density, and incorporated area were considered for the following reasons:

- Years Since Incorporation was thought to increase cost because older cities would have higher maintenance costs
- Rainfall was thought to increase maintenance costs because of higher pollutant loads and a higher need for inspections
- Income Density was thought to generate a higher tax base for a given area. This would translate into more money available for stormwater.
- Area merely reflects the size of the city much like population. Area was considered because some activities, like street sweeping, may have been more dependent on area than population.

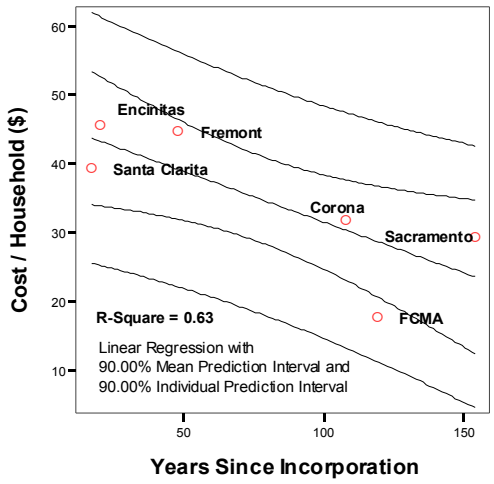

Figure G-4. Cost Per Household versus Years Since Incorporation

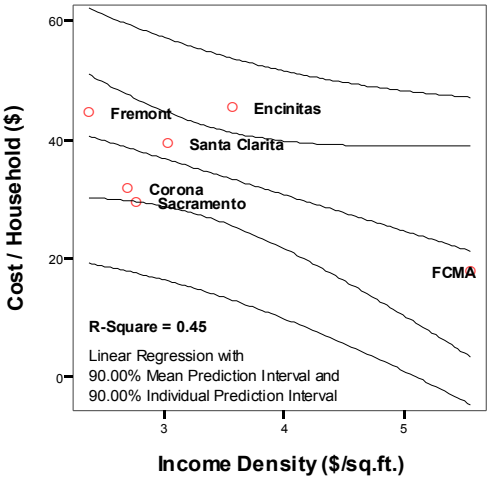

Figure G-5. Cost Per Household versus Annual Rainfall

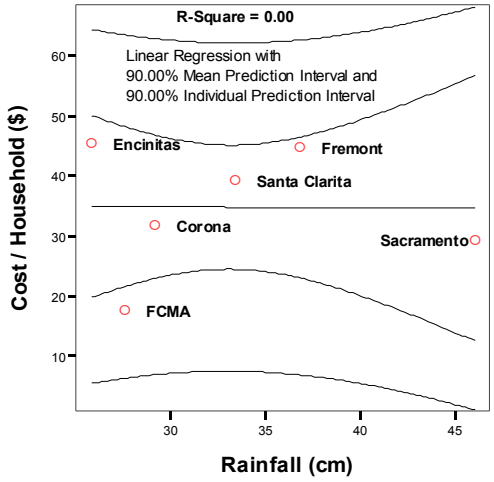

Figure G-6. Cost Per Household versus Income Density

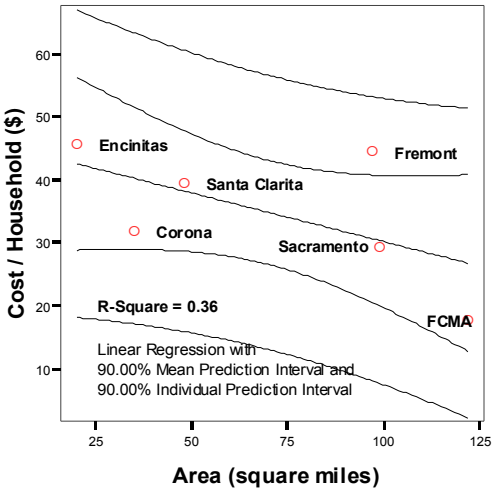

Figure G-7. Cost Per Household versus Area

Figure G-8 demonstrates that even though street sweeping is the highest cost activity, curb miles swept is not a very good predictor of stormwater costs. This is not surprising given the wide variability in street sweeping unit cost.

Another possible cost factor is type of land use but this could not be investigated due to land use data being inconsistent, or in several cases not available.

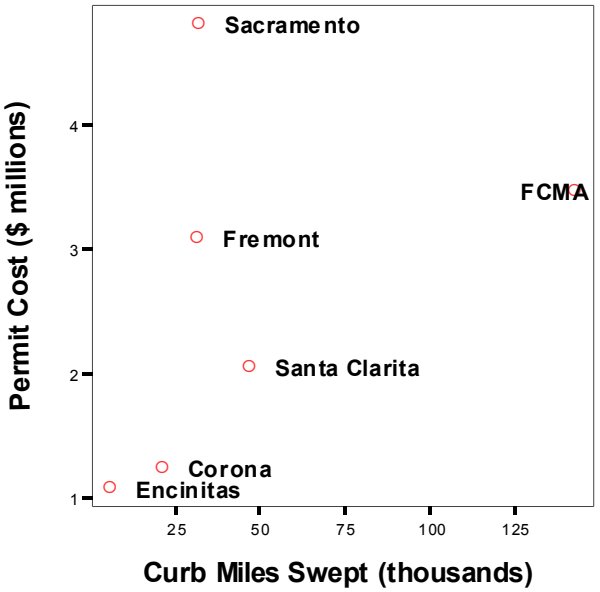

Figure G-8. Permit Cost verses Curb Mile Swept

G.2. FUTURE COST ESTIMATES FOR THE LOS ANGELES AREA

Examples of future costs are restricted to the Los Angeles area where the future compliance cost has been a source of continued controversy. Costs estimates were taken from USC studies, the Los Angeles River Trash TMDL, the Ballona Creek and Estuary Metals TMDL, and the city of Los Angeles. TMDL estimates are for control of all sources of the pollutant, not just stormwater sources. These costs are presented since future permits will reflect TMDL requirements of the TMDL costs will be attributable to stormwater quality management.

To compare these cost estimates with each other, equivalent annual cost was calculated. Equivalent annual cost is calculated by taking the present worth of all capital and annual costs and then multiplying by 3 percent to get an infinite series of annual payments. Observations on these comparisons are discussed in the following sections. Use caution when comparing costs. Each type of cost addresses certain pollutant and source scenarios. TMDLs address sources other than stormwater and also address specific pollutants. Conversely, the USC studies focus solely on stormwater pollution control but address all pollutants causing impairment to water bodies.

Costs from the Description of Alternatives for Control of Stormwater Quality in the Los Angeles County (Devinny et.al., Task B: Appendix H)

Task B is an assessment of regulatory policy to determine the intent to stormwater regulation regarding advanced treatment. Alternatives to advanced treatment that may comply with the intent of the regulations are described and costs are estimated. Task B was accomplished by faculty from the University of Southern California and the University of California Los Angeles and it is included as Appendix H.

The alternatives to advanced treatment focus on runoff reduction. The principle strategy is to reduce runoff by infiltration. The remaining runoff could be treated by conventional post-construction BMPs that are less expensive than advanced treatment. If certain discharges from these conventional BMPs still require advanced treatment, the cost of stormwater would be much less than if advanced treatment exclusively for stormwater pollution control. Based on this approach, costs for several alternatives are estimated for the area under jurisdiction by the LARWQCB. These alternatives do not include cost estimates for cases where advanced treatment is required because this need is assumed to be greatly limited. To compare these cost estimates with cost estimates from other studies, equivalent annual cost was calculated.

If source control[1] BMPs are sufficient to comply with regulations, the present worth cost is estimated at $2.8 billion ($84 million equivalent annual cost). The present worth cost, including low-tech treatment BMPs applied regionally, is between $5.7 billion and $7.4 billion ($171 million to $222 million equivalent annual cost) depending on whether cost per acre or cost per volume, respectively, were used in the estimates. Current level of effort in the Los Angeles area has only made limited progress in implementing the ideas described in Task B (Devinny, 2004). The current annual estimate of this effort is estimated at $18 per household (Radulescu and Swamikannu, 2003).

Table G-5. Equivalent Annual Cost Per Household for Task B Alternatives

Cost Scenario for the Los Angeles Area	Equivalent Annual Cost, $/household
Current Effort	18
Alternative to Advanced Treatment: Pollution Prevention Scenario (Present worth 2.8 billion)[1]	27
Alternative to Advanced Treatment: Wetlands and Infiltration Basins Scenario, calculated using cost per area (Present worth 5.7 billion)[1]	55
Alternatives to Advanced Treatment: Wetlands and Infiltration Basins Scenario, calculated using cost per capture volume (present worth 7.4 billion)[1]	71

1. Little progress has been made in implementing these scenarios (Devinny, pers. comm., 9/14/2004). These costs may be added to the current effort if existing programs continue to be required. Costs based on Devinny et. al. (Appendix H), see Table G-6 for equivalent annual cost calculation.

[1] The term "Non-structural BMP" was used by Devinny et. al. in Appendix H.

Table G-6. Calculation of Equivalent Annual Cost Per Household for Task B Alternatives

	Present Worth, 10^9	Equivalent Annual Cost, 10^6	Los Angeles County Households	Normalized Equivalent Annual Cost, $/Household
Pollution Prevention[1]	2.8	84.00	3,133,774	26.80
Wetlands and Infiltration Basins, based on unit cost per watershed area	5.7	171.00	3,133,774	54.57
Wetlands and Infiltration Basins, based on unit cost per detention volume	7.4	222.00	3,133,774	70.84

1. The pollution prevention scenario may include a small fraction of what cities are currently spending.

City of Los Angeles Bond Initiative and Future Bond Cost Estimates

On July 8, 2004, the Los Angeles Times reported that the council members of the city of Los Angeles agreed to place a $500 million bond on the November ballot to clean up local surface waters in compliance with the federal Clean Water Act. The bond revenue would pay for the first five years of projects to help the city comply with certain Clean Water Act regulations. City officials estimate they will need an additional $435 million and $750 million to fully comply with requirements to reduce pollutants including bacteria. (Garrison, 2004) Using the total compliance costs ($500, $435, and $750 million) results in $40/household[2] in equivalent annual costs.

Los Angeles River Trash TMDL

There are three cost estimates to comply with this TMDL (RWQCB, Los Angeles, 2001). Using catch basin inserts would have annual recurring costs of $66 million ($51/household), small separation units would have annual recurring costs of $183 million ($140/household), and large separation units would have annual recurring costs of $18 million ($14/household). It was not investigated why the cost of larger units is an order of magnitude less than smaller units.

Table G-7 presents the calculation worksheet for converting cost in the TMDL to equivalent annual cost per household.

[2] A discount rate of 3% and 1,275,412 households were used to calculate equivalent annual costs per household.

Table G-7. Cost Calculations for Los Angeles River Trash TMDL[1]

Scenario	2001 dollars		2003 dollars				
	Capital Cost, $10^6	Recurring O&M, $10^6	Capital Cost, $10^6	Recurring O&M, $10^6	Annualized Capital Cost[2], $10^6	Total Annual Cost, $10^6	Cost Per Household[3], $
Catch Basin Inserts Only	120	60	125	62.3	3.7	66.1	51
Small Separation Units	945	148	982	154	29.5	183	140
Large Separation Units	332	7.4	345	7.7	10.3	18.0	14

1. 2001 costs were adjusted for inflation to obtain 2003 cost figures (in millions, except cost per household).

2. A rate of 3 percent was used to calculate these costs.

3. Based on 1,300,000 households in the Los Angeles River watershed.

Ballona Creek and Estuary Metals TMDL

The Ballona Creek watershed covers 128 square miles in Los Angeles County. Open space comprises 17.5 square miles and water comprises 0.75 square miles of the Ballona Creek watershed. Cost estimates are based on the remaining 110 square miles.

Infiltration trenches and sand filters were assumed to cover 40 percent of the urbanized portion. The remaining costs were an estimate of approaches including source control and pollution prevention measures (RWQCB, Los Angeles, 2004). The equivalent annual cost per household in the watershed are estimated to be between $70 and $75.

It is noted in the TMDL that the retrofit cost per area for these devices in the Caltrans BMP Retrofit Pilot Study was nearly 10 times greater for stand alone retrofit projects. It is expected that cost will be reduced if BMPs are installed within larger reconstruction projects (Caltrans, 2004).

Table G-8 provides cost information relating to compliance with this TMDL. Annualized construction costs were calculated by multiplying the construction cost by three percent. Ranges of total annual cost were determined based on the estimates. The low side of the range includes the FHWA annualized construction cost and the USEPA recurring maintenance cost. The high side of the range includes the USEPA annualized construction cost and the recurring maintenance cost. It was assumed that 40 percent of the urbanized portion of the watershed would need to be treated by structural BMPs. Of this 40 percent, infiltration trenches would treat 20 percent of the watershed and sand filters would treat the other 20 percent. The remaining 60 percent would include enhanced pollution prevention activities (e.g. street sweeping).

Table G-8. Cost Calculations for Ballona Creek and Estuary Metals TMDL

Cost Basis	Construction Cost	Recurring Maintenance Cost	Annualized Construction Cost[2]	Total Annual Cost[3]	Cost Per Household
USEPA estimate (1999)	336	36	10.1	46.1	75
FHWA estimate (1994)	245	not reported	7.4	43.4	70

1. Dollars in millions (except cost per household).

2. A rate of 3 percent was used to calculate these costs.

3. Total cost for the FHWA includes their annualized construction cost and the USEPA recurring maintenance cost.

California Willingness to Pay for Statewide Clean Water

According to a survey (Larsen and Lew, 2003), California residents are willing to pay on average $180 per year to remove all impairments from all water bodies in the state (not just urban areas). Potential limitations with this estimate are discussed here.

This assumes cleaning water from all sources of contaminants, not just urban stormwater sources so this may not be directly compared to the cost of stormwater programs. Also, the cost of stormwater programs is only what the cities pay per household. It does not include other cost passed along to the household or individual. These costs are not incurred by the cities but by developers complying with the construction permit and Standard Urban Stormwater Mitigation Plan (SUSMPs) and industries complying with the industrial permit and businesses and individuals complying with the stormwater permit.

The survey also had 40% non-responders. This may overestimate the willingness to pay based on the assumption the people that do not respond to an environmental survey are less likely to care about environmental issues and people that do not care are less willing to pay for water quality improvement. It does not appear that these issues were addressed by the study.

The study did adjust the willingness to pay based on the average education of Californians. The sample population surveyed had a longer education than average Californians and a statistically significant correlation was found between willingness to pay and years of education. However, it is unclear from the report if the correlation was extrapolated to years of education below that of the surveyed population. This would assume that the relationship between education and willingness is the same for lower years of education.

Comparing Task B Alternatives to Advanced Treatment and TMDL Cost Estimates

The 'alternatives' described in Task B are meant to address all pollutants, while the metals or trash TMDLs only address single type pollutants yet the cost estimate is higher. In both cases, advanced treatment is not considered and common BMP costs are used. This comparison indicates the variability in cost estimates for similar stormwater scenarios. Comparing the two TMDL maximum cost estimates also demonstrate the sensitivity of cost estimates to BMP deployment scenarios. Metals are more difficult to remove than litter and thus it is expected the cost would be less, however, the metals TMDL assumed only 40% of the watershed would be retrofitted with treatment BMPs while the trash TMDL assumed 100% deployment of litter removal BMPs. A major cause of variation in these estimates is that the unit cost used in these

estimates vary from study to study. For example, the TMDL estimates use BMP unit cost that are around 10 percent of the unit cost reported by Caltrans, but the Caltrans experience was in a fully developed watershed (Los Angeles and San Diego urban areas) where utility conflicts and space limitations are common. An additional factor is that the Caltrans experience was in a stand-alone retrofit environment which likely caused cost increases over projects integrated into larger projects (Caltrans, 2004). This indicates that costs are extremely site specific and estimating regional cost is very difficult.

Table G-9 compares current costs from the California survey with various estimates to meet certain stormwater management goals. Table G-9 also includes a comparison to the California willingness-to-pay.

Table G-9. Equivalent Annual Cost per Household Comparisons between California Cost Survey Results and various estimates for water quality Los Angeles Area Future Cost Estimates[1]

Range of Current Cost from Six Surveyed California Cities		Range of Alternatives to Advanced Treatment[2]		Maximum TMDL Estimates		City of Los Angeles Bond Estimates	Statewide Clean Water Willingness To Pay Estimate[3]
				Ballona Creek Metals	L.A. River Trash		
18	46	27	71	75	141	40	180

1. Calculations are presented in Tables G-10 through G-12 and are based on the following sources for each column respectively: survey results, Devinny et al (2004), Gordon et al (2002), LARQCB (2004), LARQCB (2001), Garrison (2004), and Larsen (2003).

2. Calculated from Task B in Appendix H. Low range is the cost for attaining full compliance using only source control. High range is the cost for attaining full compliance using only treatment BMPs (low tech) estimated on capture volume.

3. Responses were not received from 40% of the mailed surveys. The survey question was for restoring water quality for all waters throughout the state from all impairment, not just within a city or region and not just for impairment from stormwater pollution (Larsen and Lew, 2003).

Cost of Advanced Treatment (Gordon et.al.)

This study presents a comprehensive analysis of the potential costs required to meet new and emerging stormwater regulations in the Los Angeles area. It assumes that advanced treatment of storm flows will be required to meet current and anticipated federal and state water quality standards. The study presents three scenarios in treatment plant size and distribution among 65 sub-basins. These scenarios are 480 plants per sub-basin, one plant per sub-basin, or one plant per city. Three runoff quantity scenarios (0.5 inch, 1.25 inch, and 2.25 inch storms) were assumed for each treatment plant scenario. The least expensive alternative for the 0.5 inch storm was using 480 plants per sub-basin. This storm depth was chosen because it was closest to the 0.75 inch storm required for treatment in the Los Angeles SUSMP. Table G-10 calculates the equivalent annual cost per household for two treatment plant scenarios for treating the 0.5 inch storm.

Table G-10. Equivalent Annual Cost Calculation for Costs from Gordon et al.

70% Capture of Annual Rainfall (0.5 inch capture volume)	Capital Cost, 10^9	O&M Cost, 10^6	Equivalent Annual Cost (EAC)[1], 10^6	EAC/Household, $
130 small plants	48	91	1,540	491
65 large plants	44	127	1,439	459

1. Cost includes collection system and land cost and maintenance of the collection system (Gordon et al. p. 40-41, 2002).

Comparing Alternatives to Advanced Treatment to Advanced Treatment Estimates

Since some advanced treatment may be required, the future cost will lie between the alternative scenarios estimate and the advanced treatment estimate. Based on the assumption used by the Devinny study, future costs for the Los Angeles area appear to hinge on the ability to reduce stormwater runoff volumes and on the ability to control pollutants through source control.

Significance of Future Compliance Cost Estimates

The range of cost estimates presented for the Los Angeles area should not be used for other areas of California. TMDL compliance, and thus ultimate permit compliance, is only addressed for certain pollutant types in the Los Angeles area. TMDL implementation plans will vary in complexity, pollutant being addressed, other non-stormwater sources, and watershed size. Some watersheds may not have a TMDL. Determining future cost for other California communities is a case-by-case exercise.

G.3 REFERENCES

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Alternative Approaches to Stormwater Quality Control

Prepared for the Los Angeles Regional Water Quality Control Board

Joseph S. Devinny
Professor, Civil and Environmental Engineering
University of Southern California
Los Angeles, California

Sheldon Kamieniecki
Professor, Political Science
University of Southern California
Los Angeles, California

Michael Stenstrom
Professor, Civil and Environmental Engineering
University of California at Los Angeles
Los Angeles, California

2004

EXECUTIVE SUMMARY

Background

A recent, widely debated study entitled *An Economic Impact Evaluation of Proposed Storm Water Treatment for Los Angeles County* projects extremely high costs for compliance with stormwater quality regulations (Gordon et al., 2002). These estimates followed from the study's fundamental assumption that the only way to comply with water quality regulations is to capture most or all of the flow and subject it to advanced treatment, and to do so at rates equal to peak runoff rates. *In contrast, this report shows that there are far less expensive approaches available that, should they be implemented, will achieve high levels of compliance with current federal water quality standards.*

Alternatives Considered

This report reviews present federal and state regulations and regulatory policy to determine whether advanced ultrafiltration treatment of the entire runoff flow is required to meet water quality standards, or whether compliance can be achieved through the widespread adoption of the various "best management practices" (BMPs) more commonly used for runoff quality control. The work identified and analyzed alternative measures that can be employed to meet present federal and state water quality standards. Particular attention was paid to strategies that concern ground water recharge, pollutant source control, and runoff detention, capture, and BMP treatment.

The report reviews possible approaches for controlling runoff water quality in the Los Angeles Region (the jurisdiction of the Los Angles Regional Water Quality Control Board) and presents a conceptual regional plan, including rough cost estimates. The study pursued a broad approach, providing an evaluation of total costs and benefits for the region, including those for municipalities, businesses, and individuals. The objective of the study was to outline a complete solution to stormwater quality problems, i.e., the plan is intended to meet the requirements of the stormwater permit and Total Maximum Daily Loads and provide acceptable water quality for the area. The alternatives of best management practices (BMPs) for control of individual pollutants (source control), and if necessary, a regional system of wetlands and infiltration facilities to provide final treatment and groundwater replenishment were chosen. These will be much cheaper than advanced treatment plants, and will provide benefits whose value exceeds costs.

Assumptions Made for Determining Costs

Following the review of possible remedial actions for stormwater pollution, a conceptual plan for the Los Angeles Region was developed. It was predicated on the following assumptions:

Because source control is always cheaper than cleaning polluted water, efforts should begin with preventing the release of pollutants to runoff. This includes measures like litter control, improved street cleaning, improved industrial housekeeping and others. Such approaches may constitute sufficient control for runoff coming from residential areas, so that these areas will require no further action.

For new residential development, anecdotal information indicates that landscaping that captures and infiltrates the first-flush storm will be of comparable cost to traditional landscaping, and should therefore be used. For commercial construction, costs may be higher, and adequate regional facilities might be substituted.

Where non-structural BMPs will not be adequate, or where implementation is very expensive, efforts must expand to include regional wetlands and stormwater parks (multiple-use infiltration basins).

Large portions of the Los Angeles Region are already built out to various degrees, constraining available stormwater management solutions. This report assumes that 1000 square miles can be characterized as "low density", and that these regions can be served by a combination of source control, treatment wetlands, and infiltration systems. Another 1000 square miles is "high density" and can be served by source control and infiltration systems. About 50 square miles are "extremely high density" (such as downtown areas) and will require more sophisticated infiltration or treatment devices that occupy smaller areas.

Estimated Costs

Total costs for compliance with runoff water quality regulations were predicted to be between $2.8 billion (if non-structural systems are sufficient for the entire region) to between $5.7 billion and $7.4 billion (if regional treatment or infiltration systems must also be constructed throughout the entire area). It is likely that regional systems will be required for at least some, but not all, of the area, so that the final costs will be somewhere between these extremes.

- Enforcement of littering, pet waste, and chemical use ordinances is expected to cost about $9 million per year.

- Public education will cost about $5 million per year. A program to detect and prevent illicit discharges to the system will cost about $80 million per year at first, but can be reduced to much lower levels as compliance is achieved.

- Increased cleaning of storm drains will be needed if regional solutions are not used, and will cost about $27 million per year.

- Trash discharges to receiving waters can be controlled by installing screening devices on catch basins, enforcing litter laws, and improving street cleaning services. Estimates are that the immediate cost of instituting these measures will be about $600 million over the Los Angeles Region.

- During periods of low flow, runoff water should be diverted to existing wastewater treatment plants. Construction costs for this effort will be about $28 million.

- Trash control and removal of particulates and their associated pollutants can be facilitated by improved street cleaning. It is expected that this will cost $7.5 million per year more than current street cleaning programs, with a present worth of $250 million.

- On-site BMPs required for individual firms might cost about $240 million. Costs associated with compliance with the ¾-inch rule for new construction will be a modest fraction of construction costs.

- With regard to structural BMPs, total costs (regional wetlands and infiltration systems) were first estimated by determining the costs per square mile of drainage area incurred at other sites, and multiplying by the area over which they will be applied. Wetlands for the "low density" areas were estimated to cost $420,000 per square mile of drainage area, for a total cost of $420 million. Infiltration systems for the "high density" areas were estimated to cost $3.7 million per square mile of drainage, for a total cost of $3.7 billion. More sophisticated treatment BMPs (such as sediment traps and oil adsorbers) for the "extremely dense" areas were estimated to cost $33 million per square mile of drainage, for a total of $1.7 billion. Thus total new facilities costs are $5.8 billion.

- A second method for estimating structural BMP costs utilized costs per acre-foot of retention capacity as determined by the Los Angeles County Department of Public Works Sun Valley Project. Presuming that runoff from a ¾-inch storm must be captured in the low-density, high density, and extremely high density areas with runoff coefficients of 0.4, 0.6, and 1.0, costs are $53,000, $98,000, and $470,000 per acre-foot, respectively. The overall facilities cost estimate using this method is $4.0 billion.

Estimated Benefits

There are substantial benefits to the examined approaches that extend beyond the value of stormwater quality control. Reductions in pollutant releases will improve public health and neighborhood livability. Restoration of the hydrologic cycle will replenish groundwater reservoirs, reduce flood risks, and provide greenspace for recreation and wildlife habitat. It was determined that the total value of benefits from the alternatives for runoff quality control described will exceed the costs. Total benefits for the non-structural stormwater quality control programs in the Los Angeles Region are estimated at $5.6 billion. Implementation of the non-structural and regional measures throughout the Los Angeles Region would have benefits worth $18 billion.

- Reduced need for flood control is expected to save about $400 million.

- Property value increases from additional greenspace and bodies of water are expected to amount to $5 billion over the Los Angeles region.

- Additional groundwater supplies created by infiltration will have a current worth of about $7.2 billion.

- "Willingness to pay" surveys in similar circumstances suggest that the public amenity value of avoiding stormwater pollution of local bodies of water is about $2.5 billion.

- Cleaner streets are worth about $950 million.

- Improved beach tourism will bring in about $100 million.

- Preservation of the nature's services in the marine coastal zone, such as nutrient recycling and chemical maintenance of the atmosphere, is worth about $2 billion.

- Reduction of sedimentation in local harbors will save $330 million.

- Improvements in public health associated with reduced exposure to fine particles from streets are likely significant, but could not be quantified.

Recommendations for Immediate Action

Municipalities that have the responsibility for meeting runoff quality regulations should take some immediate steps.

- Outreach programs, explaining to citizens the need for runoff quality control and discouraging illegal discharges such as littering, should begin.

- Data should be collected on the stormwater discharges from subwatersheds to determine what BMPs are workable, and general plans should be updated to include policies that promote stormwater control.

- An administrative structure should be established which includes the relevant stakeholders and funding agencies for each watershed (such as watershed councils).

- Funding plans should be developed.

- Building codes that work against runoff quality control should be changed immediately—in particular, all parking lots built from now on should also be stormwater infiltration systems.

- All new street cleaning equipment should be high-quality vacuuming systems. Appropriate agencies should be encouraged to use the latest microbiological

techniques to investigate sources of pathogenic organisms in runoff, so that mitigation efforts can be optimally designed.

INTRODUCTION

This report identifies and analyzes alternatives for control of stormwater runoff in Los Angeles County. A recent, widely debated study entitled, *An Economic Impact Evaluation of Proposed Storm Water Treatment for Los Angeles County* projects extremely high costs for compliance with stormwater quality regulations (Gordon et al., 2002). These estimates followed from the study's fundamental assumption that the only way to comply with water quality regulations is to capture most or all of the flow and subject it to advanced treatment, and to do so at rates equal to peak runoff rates. As this report shows, however, there are far less expensive approaches that, if implemented, can achieve high levels of compliance with current federal water quality standards.

A broad approach was taken: an evaluation was made of total costs and benefits for the region, including those for municipalities, businesses, and individuals. A complete solution to stormwater quality problems was considered—that is, the plan is intended to meet the requirements of the stormwater permit and Total Maximum Daily Load and provide acceptable water quality for the area. The recommendations for steps to be taken are not limited to the Los Angeles Regional Water Quality Control Board (LA Regional Water Board). Action by other governmental agencies will also be required. The study begins with a brief description of runoff sources and contaminants. A review of present federal and state regulations and regulatory policy to was done to determine whether advanced ultrafiltration treatment of the entire runoff flow will be required, or whether compliance can be achieved through the widespread adoption of the various "best management practices" (BMPs) more commonly used for runoff quality control. The study then identifies and analyzes alternative measures that can be employed to meet present federal and state water quality standards. Particular attention is paid to strategies that facilitate ground water recharge, source control measures, storm water detention and capture, and BMP treatment. While prevailing uncertainties make an overall cost estimate only approximate at this time, costs of specific approaches are illustrated with examples. Financial benefits, such as those regarding groundwater replenishment, more appealing beach environments, improved public health, and the creation of additional urban green space, are also addressed in the report. Clearly, water is a scarce resource in this region of the country, and economic evaluations of different management techniques for stormwater runoff must also consider the benefits of improved water quality and water supply as well as flood control. Prior to reviewing federal and state water quality regulation and policy, this study provides an overview of more general policy and regulation theory.

Runoff

The bulk of urban runoff is generated during rainfall events, and can properly be termed stormwater. This flow is extremely irregular, especially in Southern California, where most days are dry, and measurable rain occurs on average of only 32 days per year. Total rainfall in the area is modest, averaging about 16 inches per year. A large storm in this area might drop as much as three inches of rainfall in 24 hours, but this is

still much less intense than typical rainfall events in other states, such as those on the East Coast.

Even so, high flows and flooding do occur in Southern California because of the topography. Water from large watersheds drains into local rivers, and slopes are steep, so that rainfall is rapidly collected and concentrated.

Water also enters the storm drains from non-rainfall sources. Sprinklers left on overnight, car washing, and hoses used to clean sidewalks and driveways generate smaller streams sometimes called nuisance flows. These flow in the storm drain system all year, and with residual stream flows (and in a some areas, recycled wastewater), constitute dry-weather flow. The terms "stormwater" and "runoff" are often used interchangeably. However, it is important in some cases to recognize the difference—stormwater arrives suddenly in huge amounts, while nuisance flows are much smaller and run all year.

Urbanization of the landscape substantially changes the amount and composition of runoff. Because less water infiltrates (percolates) into soils, the total amount of runoff is increased. Because the water runs off pavement more rapidly, it is concentrated to make peak flows higher. Recharge of groundwater is reduced, and the shallow groundwater that feeds some streams dries up, so surface flows decrease in some areas. Surface flows may increase during dry weather in other areas because of nuisance flows from over-irrigation and car washing. In general, the storage and buffering effects of soils and groundwater reservoirs are reduced. Runoff flowing through vegetation, or entering and leaving shallow groundwater, is subject to the effects of filtration and biodegradation, which has a considerable purifying effect. Water runoff from pavement is not cleaned, and indeed is contaminated by whatever dirt and pollutants are on the pavement.

Pollutants

The cities of Southern California use "separate" systems, meaning stormwater is collected apart from the wastewater generated by toilets and showers. The wastewater enters a closed network of pipes and is carried to treatment plants. Stormwater may initially flow in underground conduits, but eventually passes to open flood control channels, rivers, and the ocean. This storm water drainage system is called a Municipal Separate Storm Sewer System (MS4). Runoff pollutants are different in nature from those in sewage. Pathogens are present, but in far smaller concentrations, as are nutrients such as phosphorus and nitrogen. There may be more petroleum hydrocarbons, dust, sediments, and settled air pollutants in runoff, but total organic content in runoff is usually much lower than in wastewater.

The pollutant load of stormwater varies greatly with location. The water contains pollutants that wash off rooftops, parking lots, industrial facilities, and the streets. Pollutants may also be discharged illegally, when individuals pour motor oil into the storm drains or industries release toxic pollutants.

Water flowing in the streets picks up trash, dust, dirt and other materials that have been deposited on the pavement. The dust includes fine particles of rubber from tire wear, settled air pollutants, trace metals from brake pads and other mechanical sources, and pet feces. Cars drip motor oil onto the pavement and the early flows of fall may carry a petroleum sheen.

Stormwater quality protection measures may be placed in three general categories. Infiltration allows percolation of the water into the ground, relying on the soil to remove pollutants from the replenishing groundwater and eliminating the discharge to runoff. Source control measures prevent the release of pollutants, so that the water is never contaminated. Treatment systems remove the pollutants from the stormwater before it reaches the ocean.

Runoff Sources and Quality

Stormwater and runoff come from a great variety of sources and carry a varied suite of pollutants. There are many approaches to the task of protecting receiving waters, and the best choice depends on stormwater source and quality. Runoff from a residential area of single-family homes, for example, is unlikely to carry industrial pollutants, but may have small amounts of oil and grease from roads, microbiological contamination from pet feces., and dissolved nutrients from fertilizers. These are readily removed by filtration in soil, so groundwater recharge, with its additional benefit of replenishing aquifers, is a good choice. Runoff from construction sites is less likely to carry harmful microorganisms, but may have heavy loads of sediment. The best choice here is to use dikes, detention ponds, and other measures to allow the sediment to settle out of the water before it is percolated to groundwater or released to storm drains. The dispersed and difficult-to-control pollutants of urban commercial areas may best be dealt with by providing regional solutions, such as parkland designed to serve simultaneously as a flood control basin, a groundwater recharge site, and a sedimentation basin for large amounts of water.

Streets

Streets, particularly those in dense commercial areas, are the most difficult source of urban runoff to manage. They receive litter, dust and dirt, air pollutant particulates, pet feces, occasional human waste, trace metals and oil from cars, various illegal discharges, and other pollutants. Because they are the first part of the stormwater collection and transport system, they receive and pass on pollutants that are carried away from parking lots, commercial establishments, and industries.

Exposed Commercial Activity

Manufacturing and other commercial activities, even those dealing with hazardous materials, have no effect on stormwater quality if the work is carried out under cover. However, for some large-scale activities, such as oil refining, this is not practical. Rain falling on machinery, materials, or contaminated surfaces can pick up pollutants. Measures can be taken to cover individual activities, or treatment systems can be installed to clean the water before release.

Construction Sites

Frequently, the first step taken in construction of new facilities is to clear the land of vegetation and pavement. The exposed soil is highly vulnerable to erosion by rainfall, and the movement of trucks and machinery can “track” soil to the adjacent streets.

Residences

Single-family homes are a source of some pollutants. Roof runoff will contain dust, bird feces and settled air pollutants. Runoff from gardens may contain pesticides

and fertilizers. Occasionally, homeowners will (illegally) dispose motor oil or paint waste into storm drains. For the most part, however, runoff from neighborhoods of single-family homes is relatively less polluted (if household toxics such as pesticides are properly used). Multiple-family residences produce many of the same pollutants, but typically have a higher ratio of rooftop and impervious surface to permeable landscaping, so that more water runs off.

Commercial Rooftops

Roof runoff from commercial facilities may be slightly polluted with air pollutant dusts, bird droppings, hydrocarbons from roof tar, and occasionally, some trace metals from rooftop machinery. The contaminants present may be very similar to those found on residential roofs, but handling the runoff may be more difficult because commercial areas have a high ratio of roof area to land area, and often have little landscaping.

Parking Lots and Landscaping

A significant fraction of urban land is devoted to parking lots. Parking lots are commonly polluted by litter, heavy metals from auto-parts and road wear, and by oil leaking from cars. Spilled food is present near establishments that sell food, and pet feces, bird droppings, and settled air pollutants will also be present, and all of these can be washed away in the runoff. Virtually all parking lots are designed for rapid drainage to the street or storm drain. Indeed, where grass or other plantings are present, these are commonly surrounded by curbs that prevent flow of the water from the lot into the soil. Many designs, in fact, promote runoff from the vegetation to the pavement.

ASSESSMENT OF REGULATORY POLICY

Overview of Policy and Regulation Theory

This report, in identifying and assessing BMPs, takes a strategic regulatory planning approach to managing stormwater runoff in Los Angeles County. Strategic regulatory planning involves a close examination of the legislative goals concerning the given policy. The ultimate end of strategic regulatory planning is to control behavior through methods that agree with legislative goals and societal values regarding the issues at hand. Thus, a strategic approach demands careful consideration first of whether enforcement is appropriate; and second, if enforcement is appropriate, to what degree should the parties involved be pressured to comply; and third, how coercive should the regulatory devices be? Compliance with existing laws and regulations, in this case the provisions of the federal Clean Water Act and state law, is a major goal of the strategic regulatory planning process.

How compliance is defined can vary markedly depending upon the actors involved and the policymaking context. In this sense "compliance" means the degree to which members of a target group conform to the directives of an agency, court, legislative body, or some other governmental agency. One way to determine whether members of a target group are in compliance with an environmental law is to monitor levels of pollution on a regular basis. We assume that the greater the number of individuals and firms that are in compliance with rules, the more likely pollution will decrease in a given locality.

When legislators pass laws, they generally expect them to be vigorously enforced and fully obeyed. Only idealists, however, actually believe that this is possible or even necessary in all cases. Political and economic factors usually force policymakers to take a more realistic approach to enforcement by setting a desired and attainable level of compliance prior to program implementation. At this stage, policymakers must consider whether 100 percent compliance is necessary. If not, they must determine what degree of compliance is needed in order to meet environmental quality goals. While the desired degree of compliance is often only a rough estimate, several factors must be kept in mind. Policymakers must take into account, for example, the extent to which members of a target group are making a “reasonable” effort to change their behavior and follow the law.

If it is either unrealistic or undesirable to aim for total compliance on the part of the target population, a clear decision rule must be formulated concerning enforcement priorities. In a policy area where polluters vary a great deal in size and how much they pollute, for example, it is commonly most prudent to concentrate enforcement efforts on the largest polluters. If firms are roughly the same size and pollute about the same amount, however, alternative guidelines for identification and discrimination must be set. For example, will businesses be selected randomly for monitoring and inspection? Is systematic enforcement, perhaps based on location, possible? Or, is self-regulation the preferable approach? The decision rule should relate to the strategic goals, resources, and motivations of all those involved. Further considerations include the legal authority

for enforcement, the resources of the enforcement agency, and the fragmentation of the enforcement agency (or agencies).

In the ex post review/revision stage, policymakers determine the effectiveness of the regulatory program after it has been implemented. Feedback and evaluation are used to assess program performance. Legislative goals are used as a guide in determining whether regulatory approaches are succeeding or failing.

If policymakers determine that the program goals are still desirable, they will continue the same course of action. If they determine that the goals are being met, they will either maintain present enforcement levels or perhaps decrease enforcement efforts. The latter decision should only be made if policymakers believe they can save time and money and feel reasonably certain that compliance rates will not suffer. Appropriate and immediate action is required, of course, if the objectives are no longer desirable or if the objectives are not being achieved. In nearly every case, the aim of policy revision will be improvement in compliance and environmental quality. According to Ingram, the implementation phase of a statutory program "should contribute toward policy improvement or the evolution toward more tractable problems for which there are more doable and agreeable responses." (1990:476) Realization of the statutory goal, therefore, is not the only way to gauge the success of program implementation.

The conceptual perspective for the selection of BMPs analyzed in this report relies on Lowi's (1964) policy classification scheme, with further elaboration by Salisbury (1968). Lowi classifies policies as distributive (non zero-sum policies in which nearly everyone benefits), redistributive (policies that approach zero-sum, in which some benefit and some lose), and regulatory (policies that also tend toward zero-sum, and in which government prescribes rules of behavior for particular groups). Salisbury added a critical dimension to Lowi's typology by identifying self-regulation policies as a fourth policy type. Self-regulation policies are frequently offered as a noncoercive alternative by sectors of society targeted for external regulation, and they are invariably non zero-sum. These policies also impose constraints upon a group, but are perceived only to increase, not decrease, the beneficial options to a particular segment of the population.

Under this classification scheme, policies are *either* self-regulatory *or* regulatory. Thus, the Lowi and Salisbury typologies suggest that regulatory policies are either noncoercive (through self-regulation) or coercive (through direct command-and-control regulation). In the real world, however, regulatory devices tend to fall at different points along a continuum of coerciveness. In other words, devices intended to control behavior tend to vary according to their restrictiveness. Non-coercive approaches (through self-regulation) occupy one end of the continuum while coercive approaches (through direct command-and-control regulation) occupy the other end.

Conceptualizing regulation in these terms provides water quality policymakers a flexible framework in which to assess alternative regulatory mechanisms. Water quality policymakers have a menu of regulatory approaches from which to choose, and careful thought must be given as to which regulatory devices are best suited to control stormwater runoff without being unnecessarily harsh. If members of the target population (e.g., citizens, small businesses, municipalities, etc.) unanimously believe that stormwater regulations and deadlines are too restrictive and unfair, they will likely ignore what they are being told to do. At the same time, if regulatory devices are too weak and not sufficiently coercive to lead to improvement in water quality, then efforts to control

stormwater runoff will fail. Water quality policymakers, therefore, must be familiar with the target population and possess considerable information before they select the most appropriate regulatory mechanisms that embody the level of coercion necessary to achieve an optimum degree of compliance.

Cost is a second dimension that characterizes regulatory mechanisms. Cost here refers to the amount of money government must spend to administer a particular regulatory approach (cost to the regulated community will be considered later). In general, the most coercive activities (e.g., imprisoning polluters) require the greatest government involvement and therefore are more expensive to administer than the least coercive activities (e.g., economic incentives). Limited government revenues obviously make this an important variable. This is especially the case in current government efforts to control stormwater pollution.

The total cost and coerciveness of the selected regulatory program represent the overall government effort necessary to attain compliance and control water pollution. Compliance can be achieved in varying degrees and is best conceptualized along a continuum ranging from avoidance to adherence. Under optimal conditions (e.g., a harmonious political environment), policymakers will be able to use the least coercive enforcement techniques (e.g., reporting by firms and municipalities and formal compliance tracking) at the least cost to achieve full compliance. The expectation is that least coercive mechanisms are always preferable to more coercive mechanisms if only because the former devices are more cost-effective. In contrast, extremely restrictive enforcement arrangements (e.g., court injunctions) will necessitate direct government involvement and thus require substantial cost. Under ideal conditions, therefore, policymakers will select regulatory devices that are the least coercive and least costly and that lead to compliant behavior.

Unfortunately for policymakers, optimal conditions are rare. Many times the conditions that do exist (e.g., a lack of agency funds or a small staff) tend to diminish the effectiveness of the least coercive approaches, often to the point where the outcomes are in danger of moving toward avoidance behavior. In order to prevent outcomes from moving in this direction, policymakers must select techniques, either singularly or in combination, that are affordable and sufficiently coercive to produce compliant behavior.

Naturally, policymaking is a dynamic process and circumstances tend to change over time. Decision makers are continuously gauging the potential impact of given conditions on regulatory mechanisms and making adjustments as they see fit. Eventually, they may be forced to adopt expensive and restrictive approaches that will result in compliant behavior in an attempt to prevent outcomes from moving toward avoidance behavior. When accurate information is available and incorporated into deliberations, policymakers usually will achieve the greatest level of compliance possible with the least effort and expense regardless of the conditions that exist at the time. This underscores the importance of obtaining the most accurate data available as changes occur over time.

In a pluralist, multi-level system like the United States, some communities may favor avoidance behavior in the face of unpopular regulations. While such situations may arise from time to time, in most cases policymakers will want their regulatory devices to achieve the highest level of compliance possible under given conditions.

Stormwater Regulation and Regulatory Intent

The federal Clean Water Act utilizes two approaches to managing water quality: technology-based requirements and national water quality standards. Section 303(d) of the Act integrates these two approaches by stipulating that states make a list of water bodies that are not attaining standards after the technology-based rules are implemented. For water bodies on this list, as well as where the U.S. Environmental Protection Agency (EPA) Administrator believes appropriate, the states are to formulate TMDLs which must account for all sources of the contaminants that forced the listing of the water bodies. Under federal law, TMDLs must account for contributions from point sources (federally permitted discharges) and pollution from nonpoint sources. The U.S. EPA must review and approve the list of contaminated waters and every TMDL. In the event that the U.S. EPA does not approve the list of impaired water bodies or a TMDL, the Agency must establish them for the state. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003)

The Clean Water Act does not specifically require the adoption of TMDLs. Instead, Section 303(d), Section 303(e), and their provisions stipulate TMDLs be included in water quality plans. The U.S. EPA has adopted rules (40 CFR 122) requiring that the National Pollutant Discharge Elimination System (NPDES) permits be modified to be consistent with all approved TMDLs. An NPDES permit outlines specific limits of pollution for a particular discharger. Nearly all the states, including California, are permitted to administer the NPDES permit program. (U.S. EPA administers the permit system in the remaining states.) Implementation plans are to be formulated along with the TMDLs.

California Law

California effectuates the provisions under the Clean Water Act principally through institutions and procedures set out in certain provisions of the California Water Code, including those of the California Porter-Cologne Water Quality Control Act. These provisions established the State Water Resources Control Board (SWRCB) within the California Environmental Protection Agency to develop and implement state policy for water quality control.

The Porter-Cologne Act also established nine California Regional Water Quality Control Boards that operate under the authority of the SWRCB. Each Regional Board is comprised of nine members and an executive officer appointed by the members of each board. The Regional Boards develop and adopt water quality control plans for all areas within their region. The SWRCB formulates, adopts, and revises general procedures for the development, adoption, and execution of water quality plans by the Regional Boards. It reviews these plans and either approves them or returns them for revision and resubmission. Water quality plans do not become effective until the SWRCB endorses the plans, followed by approval by the California Office of Administrative Law.

The Evolution of Water Pollution Control

During the 1970s, policymakers considered point source pollution to be the biggest threat to the water quality of the nation's inland lakes, rivers, and streams. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) The Clean Water Act established a number of programs to address point sources of pollution, and most federal money went to formulate and implement point source controls. California pursued the same approach in its effort to improve the state's water quality. In addition, the State and

Regional Boards implement smaller scale corrective actions for nonpoint source pollution as permitted under the Porter-Cologne Act.

A major goal of the Clean Water Act was to expand treatment of wastewaters. According to Rosenbaum (2002), all treatment plants in operation before July 1, 1977 were required to have "secondary treatment" levels. All treatment facilities, regardless of age, were required to have "the best practicable treatment technology" by July 1, 1983. The Act also appropriated 18 billion dollars between 1973 and 1975 to assist local communities in building necessary wastewater treatment facilities. The federal government paid for 75 percent of the capital cost for building the new facilities. Programs focusing on treatment facilities resulted in significant improvements in water quality by the late 1980s.

Concerns over the nation's water quality arose again due to the growing impacts of nonpoint source pollution, and environmental groups looked to the TMDL requirements to ameliorate continuing water quality problems. A series of lawsuits ensued to force regulators to adopt an aggressive approach to TMDL development. Thus far, over 40 lawsuits have been filed throughout the nation, most of them by environmental groups. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) The lawsuits are commonly filed against the U.S. EPA due to its responsibility to approve TMDLs. Several of them have led to negotiated settlements and consent decrees that are overseen by the courts. At present, California is operating under three consent decrees covering most of the North Coast Region, the entire Los Angeles Region, and Newport Bay and its tributaries in the Santa Ana Region.

TMDLs in California are established either by the Regional Boards or by the U.S. EPA. Those established by the Regional Boards are designed as Basin Plan amendments and include implementation rules. Those formulated by the U.S. EPA normally contain the total waste load allocations as required by Section 303(d), but do not include extensive implementation rules, primarily because U.S. EPA implementation of nonpoint source pollution control strategies are generally confined to education and outreach in accordance with CWA Section 319. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) Presently, TMDLs are required for all waters and pollutants on the 303(d) list and must consider and include allocations to both point sources and nonpoint sources of contaminants. The limitations in a TMDL may be other than "daily load" limits. There also can be multiple TMDLs on a specific body of water, or there can be one TMDL that focuses on many contaminants. Current examples of TMDLs in the Los Angeles Region include the trash TMDLs for the Ballona Creek and Wetland, Los Angeles River Watershed, and East Fork San Gabriel River, and the wet-weather bacteria TMDL for the Santa Monica Bay Beaches. At this time the Section 303(d) list contains over 1,400 water body/pollutant combinations. Based on this list, the State Board estimates that about 800 TMDLs are needed. The Regional Boards are now developing over 120 TMDLs, with several addressing multiple pollutants. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003)

Concerns over implementation have become a significant issue in the formulation of TMDLs. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) Although these concerns generally fall outside the provisions of Section 303(d), they are nevertheless important to achieving water quality improvements as a result of the establishment of TMDLs. While it is possible to conduct technical assessments of total load without

considering implementation issues, one must address the possible mechanisms by which pollution can be reduced in determining allocations to various sources. Considering different implementation options can help analysts avoid adopting allocation schemes that are far more costly than necessary or, even worse, unachievable. The TMDL strategy in California seeks to engage the public and cultivate an understanding of watershed issues. It relies on an adaptive process that matches management capabilities with scientific knowledge and information.

The Stormwater Permit

The Los Angeles Regional Water Quality Control Board (LA Regional Water Board) has adopted a NPDES permit containing waste discharge requirements for MS4 discharges within the County of Los Angeles (with the City of Long Beach excluded because it is covered under a separate MS4 permit). The main intent of the Permit is to reduce significantly the amount of various pollutants contained in stormwater runoff. The County of Los Angeles has identified seven critical industrial and commercial sources of contamination: 1. wholesale trade (scrap recycling, automobile dismantling), 2. automotive repair/parking, 3. fabricated metal products, 4. motor freight, 5. chemical and allied products, 6. automotive dealers/gasoline stations, and 7. primary metal products. The priority industrial sectors and automobile repair facilities/ gas stations (two of the commercial sectors) on the list contribute substantial concentrations of heavy metals to stormwater. Overall, the Permit is intended to establish and implement a timely, comprehensive, cost-effective stormwater pollution control program to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable (MEP) from the permitted regions in the County of Los Angeles to the waters of the U.S. subject to the jurisdiction of the Permittees and also meet water quality standards. BMPs must be identified and implemented to reduce the discharge of pollutants in stormwater to the MEP and also meet water quality standards.

The Permit has established an iterative process that allows municipalities in Los Angeles County to measure noncompliance, test alternative BMPs, and consult County and regional water quality authorities. Thus, the Permit provides a mechanism to make adjustments to the required BMPs as necessary to ensure their adequate performance. According to the U.S. EPA, "Water quality-based effluent limits for NPDES-regulated stormwater discharges that implement wasteload allocations in TMDLs *may* be expressed in the form of BMPs under specified circumstances….If BMPs alone adequately implement wasteload allocations, then additional controls are not necessary." (U.S. EPA, Memorandum, November 22, 2002, p.2)

Regulatory Mechanisms

Pollution control regulations can range from programs that prescribe very specifically what the regulated community is to do, to programs that only set goals and leave the community to find the best methods to reach the goals. Programs of the first kind are often criticized by the regulated community for lack of flexibility—the standard complaint is "This approach does not work well for our particular case. We could do this in another way and accomplish the goals for a lower price". Programs of the second kind provide flexibility, but are often criticized for vagueness: "We don't know how to do this. We are not sure what we have to do to come into compliance".

The stormwater management program is clearly of the second type, and it should be so. Stormwater quality control is an extremely complex issue, influencing, if not everything under the sun, then everything under the rain. The best means of compliance will certainly differ from city to city, depending on land uses, land prices, and a host of physical characteristics of the landscape. It is likely that, as the nation engages the problem, new approaches will be developed. Entrepreneurs will develop new devices and methods as others are tried and discarded. Strict specification of methods at this time might well eliminate approaches that are more economical and effective, so a flexible approach is best.

However, an inevitable side effect of maintaining flexibility is that the regulated community faces an unsettling level of uncertainty. Mayors and city councils faced with planning future infrastructure and future budgets are understandably uncomfortable facing mandatory water quality goals without specified means of reaching those goals. This level of uncertainty will decline as plans are developed and experience with water quality control measures accumulates.

There is a historical precedent for this approach in the program for control of air pollution in Southern California. Like stormwater pollution, it is generated by a very large number of sources with varying compositions and emissions rates. Many of the sources are difficult to monitor and regulate. Implementation of pollution controls has been accompanied by intense political controversy. Even so, air pollution control efforts have been relatively successful—pollution levels and their associated health effects have declined. While costs have been high and some high-polluting marginally profitable businesses have closed or left the area, it is also clearly true that the economy of the area has not collapsed, as some predicted. Few people would suggest that we should return to days when taking a deep breath was literally painful.

Policy Implementation

Our research indicates that the LA Regional Water Board is strongly committed to abating pollution from stormwater runoff as effectively and inexpensively as possible. The U.S. EPA supports the LA Regional Water Board's efforts to require individual municipalities in Los Angeles County to adopt necessary BMPs to control stormwater runoff. Federal and state policymakers along with environmental group leaders believe that BMPs, if widely and strategically implemented, can significantly reduce stormwater pollution and improve water quality throughout Los Angeles County. Given the proven effectiveness of BMPs in different areas of the country (and the world), the LA Regional Water Board does not envision the need to build new advanced treatment plants throughout the region, and indeed has expressed the specific intent that such plants should not be required. Advanced treatment is viewed as an absolute last resort given the huge expense it would entail and the confidence policymakers and environmental leaders have in the ability of BMPs to reduce pollution significantly and allow the region to meet federal clean water standards. The authors of this report concur with this position. Some municipal leaders in Los Angeles County have asked why they should be forced to adopt BMPs when there is a possibility that advanced wastewater treatment plants will ultimately be required. Even if advanced treatment plants are necessary in the future, which is highly unlikely, the adoption of BMPs will dramatically reduce the amount of water and the mass of pollutants these plants will treat. This will reduce pollution

treatment costs and improve the effectiveness and ability of plants to handle large volumes of water during heavy rain periods. That is, BMPs will be used as part of any program to build advanced treatment plants because the much cheaper BMPs will reduce the costs of the very expensive advanced treatment plants. Implementing BMPs now will be a good investment even in the unlikely event that an advanced treatment plant is required.

The LA Regional Water Board has focused some efforts on reducing trash in stormwater runoff, and it has adopted a "zero trash" rule to achieve this goal. The Board does not expect all communities to eliminate every single piece of trash from inclusion in stormwater runoff. Instead, the Board policy is that communities in Los Angeles County make reasonable efforts to prevent trash from entering storm drains. "Trash" is defined as materials larger than ½ cm, so municipalities can comply with this regulation by installing ½-cm screening devices on their catch basins, by enforcing litter laws already on the books and by conducting street sweeping in areas where trash tends to accumulate. Public education about littering and the installation and maintenance of catch basin devices can provide substantial progress in preventing garbage from entering storm drains.

In order to avoid a costly court battle with state water pollution policymakers, the County and City of Los Angeles have recently agreed to spend $168 million to reduce by half the amount of trash that collects in the 51-mile-long Los Angeles River (McGreevy and Weiss, 2003). In addition, the City of Los Angeles agreed to drop its lawsuit against state policymakers over the overall plan to abate polluted stormwater runoff. The agreement settles a lawsuit filed by the city and county that opposed the LA Regional Water Board's requirement to reduce trash entering the river 10 percent annually over the next 10 years. The LA Regional Water Board officials negotiated the deal, which requires the city and county to reduce rubbish going into the river and Ballona Creek 50 percent by September 2008, at which point state regulators will consider whether further rules are necessary. The agreement also provides local officials more flexibility in trying less-costly approaches of reducing trash. Environmental groups such as Heal the Bay, Santa Monica BayKeeper, and Friends of the L.A. River applauded the agreement. Rather than spend money on litigation, county and city officials will allocate funds to improve water quality.

Clearly, all communities in Los Angeles County will have to share the financial burden in helping to reduce contamination from stormwater runoff. This may require many communities to modify their budget priorities.

As long as communities make a reasonable, good faith effort to address stormwater pollution issues, it is unlikely that federal and state officials will take legal action. Thus far, this has been the case. Failure to make such an effort, however, will certainly result in legal action against violators. Moreover, environmental groups can choose to file lawsuits against federal and state officials if they do not continue to pursue polluters. Such action will lead to costly delays in meeting federal water quality standards and will likely lead to even more draconian measures given present federal and state law and previous judicial decisions.

Previous Actions by the LA Regional Water Board

The impacts on water quality and the heightened risks to public health from MS4 discharges that affect receiving waters across the U.S. and in Los Angeles County and its coastline have been well studied and documented. Accordingly, the LA Regional Water Board has taken a number of significant actions to control such discharges (LARWQCB, 2001)

In 1990, the LA Regional Water Board adopted Order No. 90-079, the Los Angeles County MS4 Permit. That permit required the Los Angeles County Flood Control District, the County of Los Angeles, and the incorporated municipalities in Los Angeles County to implement stormwater pollution controls including updating ordinances, optimizing existing pollutant controls such as street sweeping, construction site controls, and others. The Regional Board required all Permittees to adopt at least 13 specific BMPs for consistency across the County. The 1990 permit was executed on a system wide basis due to the highly interconnected storm drain system serving a population substantially larger than 100,000 residents. At this point, the region was committed to MEP standards—cleaning up stormwater to the maximum extent practicable.

On July 15, 1996 the LA Regional Water Board issued Order No. 96-054 that updated the 1990 permit. The 1996 Los Angeles County MS4 permit required model programs be formulated and implemented by the Permittees for Public Information and Public Participation, Industrial/Commercial Activities, Development Construction, Illicit Connections and Illicit Discharges, Public Agency Activities, and Development Planning. These model programs will change with time as more data on stormwater impacts are collected and become available.

On January 31, 2001 the Los Angeles County Department of Public Works formerly requested to renew their MS4 permit in the form of an ROWD for the County of Los Angeles and the incorporated cities, except the City of Long Beach. This request began the process of reissuance of the permit, which entered into its third permit term. On the same day the Los Angeles County Flood Control District submitted an ROWD. The Regional Board staff invested considerable time and effort in providing opportunities for public participation and comment. Over 30 meetings, two workshops, and many outreach activities were conducted to allow the public, Permittees, and other interested parties enough opportunity to participate in the development of permit requirements and language prior to consideration by the Regional Board for adoption. The reissued MS4 permit committed the region to meeting water quality standards based on the State Water Resources Control Board's precedential Orders.

Implementation of the MS4 permit requirements should reduce pollutants in stormwater in a cost-effective manner. The adoption of BMPs should also reduce pollutant discharges and enhance the quality of surface water.

The final steps of the regulatory process are now under way—TMDLs for the various impaired water bodies of the region are being promulgated.

Overall, it is clear that the LA Regional Water Board does not intend to require that municipalities build advanced treatment plants: indeed, they have publicly expressed the sentiment that they oppose this solution.

Implementation of Regional Solutions

A regional infiltration and BMP treatment system, in combination with source control of trash, pesticides, and trace metals, can substitute for individual site controls on land parcels within the drainage area. This could take the form of "Local Equivalent Area Drainages", implementing regional solutions that would achieve better results than the application of new source controls, which, in built up areas, will have significant effects only over the long term during which existing structures are rebuilt.

Funding for regional solutions may pose a challenge because of Proposition 13 and other restrictions on tax policy. The challenge however is not insurmountable if property-owners and voters become adequately informed and educated. Nevertheless, regional solutions may significantly shift administrative and cost burdens for water quality protection from businesses and development firms to local government.

Trading Schemes

"Cap and trade" systems, in which regulatory agencies set a cap on the amount of pollution allowable and allow trading of discharge rights within the constraints of the cap, have been successful in several fields. A group of municipalities, for example, might assign discharge rights to landowners within a watershed such that total releases meet the constraints of the TMDLs. They could then allow trading in the discharge rights, so that those who can reduce discharges at least cost are the first to do so, and the overall cost of meeting the TMDL is minimized. Municipalities themselves, as owners of parks and open space, might be able to develop regional solutions and fund them through sales of discharge rights to others.

Stormwater pollution control may be particularly amenable to this approach because the costs of control are highly site-specific. In many cases, there may be considerable economy in applying regional solutions in the best possible sites rather than controlling every site individually.

DESCRIPTION OF ALTERNATIVE APPROACHES

Infiltration

Before the City of Los Angeles was established, most of the rain that fell in the region evaporated or percolated into the soil. The groundwater was continually replenished and runoff flows were small. As population grew, impermeable surfaces such as paved roads, parking lots, and rooftops covered more and more of the land. Residences, commercial facilities, and roads were designed to shed water as rapidly as possible. Historical measurements of discharges to the Los Angeles River at Firestone Boulevard indicate that runoff has increased from 5% to 45% of rainfall. This change adversely affected stormwater quality in two ways. First it increased the amount of stormwater flow, magnifying the cost of any measures to control quality (and also requiring ever more costly flood control measures). Second, water that flowed directly to streams and the ocean no longer benefited from the purifying action of soil and vegetation, which can remove particulates through physical filtering, sequester some chemicals by adsorption, and destroy organic and biological contaminants by biodegradation.

Any program for remediation of stormwater contamination should reverse this trend, reducing the load of both water and pollutants on other parts of the system. At the same time, pollution of groundwater must be avoided. However, infiltration will benefit from the very considerable capacity of soils to filter particles, adsorb contaminants, and biodegrade organic materials. A relative estimate of the magnitude of the problem may be made by comparison with examples of leaking underground storage tanks at gasoline stations. In many cases, spills of tens or hundreds of gallons of gasoline are now being handled by "intrinsic remediation"—allowing natural biodegradation to degrade the hydrocarbons. The acceptability of this approach has been supported by extensive research. Hydrocarbon infiltration with stormwater will involve far lower concentrations of hydrocarbon, and will mostly be the higher-molecular-weight compounds that are much less mobile in soils than gasoline.

We can also compare stormwater infiltration to the effects of septic tanks. These systems infiltrate sewage that has received only a modest degree of treatment. Yet they are still in use in the Los Angeles Region, and indeed are the primary waste disposal method for 15% of households in the U.S. Groundwater contamination from septic tanks has occurred, but most are considered effective and safe waste disposal systems.

This comparison suggests that the relatively low concentrations of pollutants in common stormwater, with appropriate controls on sources of specific contaminants, will not pose a significant threat to groundwater quality.

The permeability of soils in the Los Angeles basin varies from place to place. Beneath the Whittier Narrows spreading basins, for example, sand and gravel deposits allow very high rates of infiltration. In other areas, clay-rich soils reduce rates of infiltration. However, the historically low rates of runoff indicate that infiltration is capable of handling the bulk of the rainfall in the Los Angeles Region. Many areas routinely considered as having poor infiltration rates will never the less be useful as multi-purpose infiltration systems. A soccer field, for example, can be used as an

infiltration basin at little additional cost, and will make a valuable contribution even if infiltration rates are low in comparison to those in spreading basins.

Source Control

Industrial Releases

Industrial discharges can be controlled by a vigorous program of source identification and control. Businesses have a fundamental responsibility to do their work without contaminating their neighborhoods, and in the great majority of cases can do so without significant interference with their activities.

Trash Management

Many businesses and some homeowners contribute a disproportionate amount of trash to the urban burden. Paper waste often accumulates in the parking lots of fast food outlets and strip malls, where it can wash into the street during rainstorms. Inadequate dumpsters and garbage cans are overloaded so that trash spills into the streets. Poorly covered trucks can allow trash to fly out on the streets. In addition, citizens throw trash from their cars onto the streets (it has been estimated that as much as 60% of trash on freeways by weight is cigarette butts). All of these practices are illegal, but enforcement is currently rare and weak. While perfect compliance with anti-litter laws is not expected, there could certainly be major improvements through enforcement. Much of the cost of such efforts could be recovered through fines, with the satisfying result that those causing the problem would be paying for cleaning it up.

Municipalities are responsible for the trash deposited on their streets, and most will respond by installing screens on catch basins. These are sometimes referred to as catch basin "inserts". They will have half-centimeter openings and will be designed to collect trash during periods of low or modest flow, but to bypass the flow during heavy storms or if they are clogged. This will avoid local flooding that would be caused by clogging.

Street Cleaning

Trash that escapes enforcement efforts can be collected by street cleaning before it reaches the storm drains. Enhanced street cleaning is likely to be necessary as cities install half-centimeter screens on their catch basins. Trash that is now washed out of sight (at least until it reaches the beaches) will accumulate on the screens and possibly clog them. More effective and more frequent street cleaning will reduce this problem.

A major fraction of the pollutants in stormwater runoff are adsorbed on particles—this is particularly true of trace metals and pesticides, which are significant contributors to impairment of the receiving waters. Some of this particulate matter can be removed from streets by higher-quality street vacuuming equipment, which collects the dirt much as a vacuum cleaner does. This equipment is more expensive to purchase and operate, but it would make a significant contribution to reducing chemical pollutants in stormwater.

The Port of Seattle has tested high-quality street sweepers as a cleanup method in its container storage area (FHWA, 2003). The approach was successful, removing one-third to one-half of particulates and their associated pollutants. While the equipment is somewhat more expensive than simple sweepers to purchase, operations costs are about

the same. The fine particles carry a significant portion of the pollutants, but they constitute only a small portion of the total mass of material on the streets, so their collection and disposal does not significantly increase costs. Such street cleaning may be more effective in Southern California, where the long dry season allows dust to accumulate for many months.

As explained in detail later, there would be substantial secondary benefits associated with improved street cleaning. Neighborhoods would look better, and residents would be exposed to less resuspended road dust, which dirties buildings and may have significant negative health effects.

Some investigators have also proposed street washing, using recycled water. If this were done during dry weather, and all of the dry-weather flow were being collected for treatment in wastewater treatment plants, street pollutants would be kept out of the rivers.

Pesticide Substitutions

Many of the receiving waters in the Los Angeles Region are impaired by pesticides, particularly Diazinon and Chlorpyrifos. The approach to this pollution should be the same as it has been historically for other pesticides that threatened environmental quality. None has ever been dealt with by treating contaminated waters. Those who use the pesticides should be responsible for ensuring that no water pollution results from that use. Pesticides that cannot be properly managed by appropriate use protocols such as labeling or use rules enforcement and which have an inherent tendency to persist in the environment should be banned. Pesticide controls are instituted by the state and federal governments, so additional political effort will be needed if a bans on specific compounds are required.

We presume that these pesticides are used in many cases because they are currently the most economical approach to insect control, and that substitution of another method would involve some cost. However, there are many possible alternatives, including use of more readily degraded pesticides, insect-resistant strains of plants, biological control with natural insect predators, and others. There are many examples of success with such integrated pest management (IPM), particularly at golf courses (NRDC, 1999). In some cases owners were pleased to find that costs actually declined when they switched from pesticide-dominated approaches to IPM.

Trace Metals

Trace metals enter stormwater as rain drains from industrial operations, transportation land uses, and other sources. Brake pad wear on cars produces a fine dust of copper. Zinc is released when galvanized equipment contacts the water. Trace metals in stormwater can be controlled by covering machinery and materials that release trace metals, by capturing and treating runoff from large industrial operations and transportation land uses, and by developing alternative materials for brake pads (research is currently under way on this objective).

Control of Automotive-Related Sources

Motor vehicles and related facilities are the source of many types of runoff pollutants, including hydrocarbons from oil and fuel leaks, and road wear. Vacuum street cleaning is effective in dealing with particle-bound hydrocarbons left on the street,

and infiltration can effectively deal with hydrocarbons that are transported or deposited off the street surface.

Control of Bacteria

Bacterial contamination in stormwater is typically measured as counts of "coliform" bacteria, a category that contains many species of bacteria. While very few of the coliforms cause disease, some of these species are very abundant in human waste, and so detection of the group has long been used as a marker for sewage pollution. Efforts to interrupt the fecal-oral transmission of disease have commonly taken the elimination of coliforms from water as a surrogate for judging efforts to prevent the spread of the microorganisms that do cause disease. Where coliform counts in drinking water have been reduced (in much of the industrialized world) transmission of water-borne disease has indeed been largely eliminated. Thus the use of coliform counts as a marker for disease control has been remarkably successful. In some cases, a more specific test for "fecal coliforms" is used, because the test is an indicator of contamination by warm-blooded animals, including humans. While we have always counted coliforms, the real concern is pathogens—microorganisms that can cause disease. For sewage pollution, the association between the two has been strong, and controlling coliforms has been equivalent to controlling disease. The situation for stormwater, however, may be far more complex. Because there are many non-human sources of coliforms, it is possible that the test for their presence may be positive even when no human pathogens are present.

The sources of the coliforms found in stormwater remain uncertain. Pet wastes certainly include bacteria that test positive as coliforms, but the degree to which pet wastes constitute a disease threat is uncertain. Wild mammals, such as raccoons, possums, skunks and coyotes, may contribute when their wastes are left on paved surfaces. It has been proposed that fecal matter from homeless people denied access to restrooms may be a source, but there has been no study confirming this. In less developed areas with poor soil infiltration conditions, it is likely that poorly operated septic tanks and illegal disposal of gray water are contributing to the coliform counts detected in runoff. If septic tanks are the source, strict enforcement of waste control ordinances is appropriate. If homeless people are the source, provision of restroom facilities would be far cheaper than any imaginable stormwater treatment system (as well as being more humane). If pet feces are the source, the only approach is, through public outreach and enforcement, to press people to clean up after their pets. It must be expected, however, that such an approach will not be 100% effective. The contribution of wild animals seems uncontrollable.

Because the sources and significance of the coliform counts remain uncertain, it is important that research on the topic be pursued immediately. The recent development of genetic techniques for precise and rapid identification of bacterial species now provides the tool needed to provide the information needed to develop effective policies.

Coliforms, and presumably the associated human pathogens, are substantially reduced in treatment wetlands. Infiltration of course removes them from runoff flows, and adsorption on soils and biodegradation are effective at protecting groundwater. Water storage, because it holds coliforms in an environment for which they are not adapted, and because it allows settling of particles to which they may be attached, has

some beneficial effect. Disinfection, using chlorine, chloramines, or ultraviolet light is possible, but relatively expensive.

Water Quality Control Board Rules allow for 17 exceedences of the coliform limit per year. There are about 32 days per year of significant rainfall in the region, so it has been anticipated that exceedences during the heavy winter storms will be difficult to control, and will be allowed.

Improved Enforcement

It is important that source control efforts include genuine and credible enforcement. Rules that are widely ignored, of course, will not help clean up runoff water, and a considerable fraction of runoff contaminants come from illicit discharges or disposal. Trash is an obvious example—littering is already illegal, so 100% of the trash in stormwater represents illegal release.

The Environmental Protection agency describes an example in which improved enforcement of existing law was effective (USEPA, 1999):

"…during a 12-month period, the Houston, Texas, Public Utilities Department identified 132 sources of discharges leading to Buffalo Bayou, the local drinking water source, with estimated flow rates ranging from 0.3 to 31.5 liters per second. Houston's program involved monthly sampling from bridge crossings; analysis of samples for carbonaceous biochemical oxygen demand, ammonia and nitrate nitrogen, pH, TSS, DO, temperature, fecal coliform, and chlorine residual; comparison of samples to baseline flow concentrations; weekly sampling of temperature, dissolved oxygen (DO), and fecal coliform in stream reaches suspected of contamination; boat sampling to identify the contaminating outfalls along the reach; and, finally, a land-based search to pinpoint the source. Of the flows identified during the program, 85% were due to broken or clogged wastewater lines and 10% were due to illicit connections (Glanton et al., 1992). Eight months after an illicit discharge detection and elimination program began, fecal bacteria log mean concentration was reduced from 20,000 colonies/100mL to 2,000 colonies/100ml."

Thus, in this example, a 90% reduction in bacterial contamination resulted from a careful enforcement program alone.

Detention and BMP Treatment

Stormwater Detention Basins

Many of the problems of stormwater management are associated with its very irregular rate of flow. During dry periods runoff flow rates are so low that the water can be handled by existing sanitary wastewater treatment systems. During rainstorms, the water comes so fast that municipalities have had difficulty doing anything beyond avoiding floods.

The first step toward dealing with this problem is to increase infiltration—substantial reductions in the peak flow rates are possible. The second approach is to provide storage systems that will hold water back during the peak flow periods. Detention basins will reduce peak flows, collect trash, provide quiet water for settlement of particles and their associated pollutants, and promote infiltration. Analysis of the

National BMP Database (Strecker et al., 2003) shows that detention basins infiltrate an average of 30% of the water they receive.

The primary difficulty with this approach is the shortage of available sites to construct large reservoirs. The topography of the Los Angeles area does not include any deep canyons in lower reaches of the rivers that could easily be made into reservoirs. Moreover, virtually all of the land is already occupied by other uses and would accordingly be very expensive to acquire.

This means that detention basins must be conceived as a distributed network of smaller systems, with each serving multiple uses. A useful model is the Sepulveda Dam Recreational Area, which retains water during storms to prevent downstream flooding. For the great majority of the days in the year, the basin is mostly empty, and serves as a park and a wildlife refuge.

A rough estimate of the general feasibility of a regional-park-based approach can be calculated. The City of Los Angeles currently has about 5% of its area in parks (Wolch et al., 2002) and it is reasonable to presume that at least a similar fraction is park throughout the LA Region. Thus, moving the rainfall from adjacent developed areas to the parks would constitute concentration of the flow by a factor of 20 (20 acres of land would drain to 1 acre of park). If the runoff coefficient for the developed areas is 0.5, a rainfall of ¾ inch would thus put 8 inches of water in the parks. This is less than the 24-inch depth of flooding assumed for the stormwater parks planned in the Sun Valley project, suggesting that this approach is feasible on the large scale in terms of the amount of land required.

This calculation is quite approximate: the runoff coefficient is uncertain, and several other factors are poorly known. Never the less, the calculation suggests that a joint program could simultaneously provide the region with needed parks and needed stormwater infiltration capacity.

Sanitary Treatment of Dry Weather Flows

During dry weather, small flows are present in the stormwater system as a result of overwatering of lawns, car washing, and other discharges. This modest amount of water can be collected and passed through existing wastewater treatment plants, which commonly have more than enough excess capacity for this purpose. Because the dry season in Southern California is very long, this would prevent runoff pollution of the oceans for much of the year.

Where this is done, street washing with recycled water would be possible. Collecting and treating the contaminants during dry periods would leave the streets clean for the rainstorms, when the water cannot be collected.

Treatment Wetlands

Wetlands remove many pollutants from the water that passes through them. The low flow velocities allow sediments to settle, removing particulates and any pollutants that are adsorbed on them. Algae and rooted plants absorb nitrate and phosphate as they grow. Vigorous microbiological activity degrades organic chemicals, as microbial predators consume disease organisms. These observations suggest that wetlands can be constructed to serve as treatment systems for stormwater and dry weather runoff. While this approach requires dedication of land, it has the considerable secondary benefit of providing riparian wildlife habitat and esthetic values.

A system of treatment wetlands has been designed for the San Diego Creek Watershed that drains to Newport Bay, in Orange County, California. The system will serve an area of 120 square miles, and is expected to cost in the low tens of millions of dollars. It is expected to meet the low-flow nitrogen TMDL, the phosphorus TMDL during most years, and the fecal coliform TMDL during low flows.

A similar system has been constructed to provide stormwater quality protection for the Ballona Wetlands Watershed in the City of Los Angeles.

BMP Treatment of Flows from Problem Watersheds such as Industrial Areas

If source control is not successful for some industrial areas, it may be necessary to collect the runoff water and use more sophisticated BMP treatment. These might best be constructed as private facilities serving a consortium of local industries, and funded by them for the purpose. A public/private partnership could be created, perhaps with public loan guarantees. Past experience with business improvement districts could serve as a model.

Partial Treatment in Curbside Units

Many proprietary devices have been developed for treatment of runoff as it enters curbside catch basins. These generally remove trash from the flow, and may also collect sediments. Some include adsorbants to remove hydrocarbons and trace metals. They have the disadvantage that they are designed to bypass during higher volume wet-weather flows. All require some degree of maintenance, and some are expensive to install. Trash and sediment must be removed on a regular basis, and adsorbants must be replaced when they are exhausted. Never the less, they may be useful for treatment of problem dry weather flows in specific areas, such as industrial or commercial zones.

Public Outreach and Education

Much of the pollution in runoff water arises from actions of individuals—litter is discarded in the street, for example, or pesticides are used carelessly in a residential garden. This pollutant load can be reduced by educating citizens and urging them to behave in a way that protects water quality.

An effort in Oregon, conducted by the Tillamook Bay Rural Clean Water Project, was made to educate local farmers about the steps they could take to protect local streams. This involved personal visits, tours of successful BMPs, newsletters, and presentations (USEPA, 1999). Four years after the program began, bacterial concentrations dropped 40% to 60% in Tillamook Bay and 50% to 80% in local rivers. Thus in some cases significant progress can be made at very low cost through public education.

Good Housekeeping for Municipal Operations

While the behavior of individual citizens may be difficult to control, municipalities have far more control over their own operations. Efforts can be made to avoid careless use of pesticides and fertilizers on municipal facilities. Such steps have modest, but measurable impacts. An EPA report notes (USEPA, 1999):

> "…the City of Bellevue, Washington, found that street cleaning three times a week removed about only 10% of urban runoff pollutants; catch basin cleaning

twice a year was estimated to be about 25% effective" (Pitt and Bissonnette, 1984).

Combined Approaches for Stormwater Quality Management

A general classification of rainfall receivers and appropriate methods for dealing with runoff they produce is shown in Figure 1. While the approach it describes is quite general, and other mixes of alternatives are possible, it shows one set of measures that can be used to control stormwater pollution.

Streets

The first step in reducing pollutants on streets is to restrict pollutant discharges from adjacent properties. Source control measures should prevent the release of industrial pollutants and construction sites should be managed to contain sediments. Litter laws and pet dropping collection laws should be enforced, although it must be acknowledged that it is not possible to prevent these inputs entirely. To stop litter from entering the storm drains, cities should install half-centimeter screens on their catch basins. The use of such screens will require diligent street cleaning, to ensure that the drains are not blocked during storms. In Southern California, rains mostly occur during a well-defined season, and frequently weather reports give two or three days warning of major storms. Cities should develop contingency plans for rapid-response street cleaning when storms are coming, to minimize stormwater contamination and the chances of flooding caused by clogged screens.

In some areas, where runoff water quality is relatively good, the streets themselves might be used as groundwater recharge facilities, by converting unused alleys to park/detention basins or by using permeable pavements.

It remains likely, however, that much street runoff will be of marginal quality. For the immediate future, it is also likely that a major portion of runoff from other sources will be initially discharged to streets, so that efforts to make use of stormwater as a water resource will require collection, and a degree of treatment before infiltration.

In most cases, this can be done with regional solutions. Water from storm drains can be collected in detention basins and wetlands, where sedimentation and biological activity will reduce pollutant load, and groundwater recharge can occur. The detention basins will serve as parks during the greater part of the year when water is not present, and the wetlands will double as much-needed wildlife habitat.

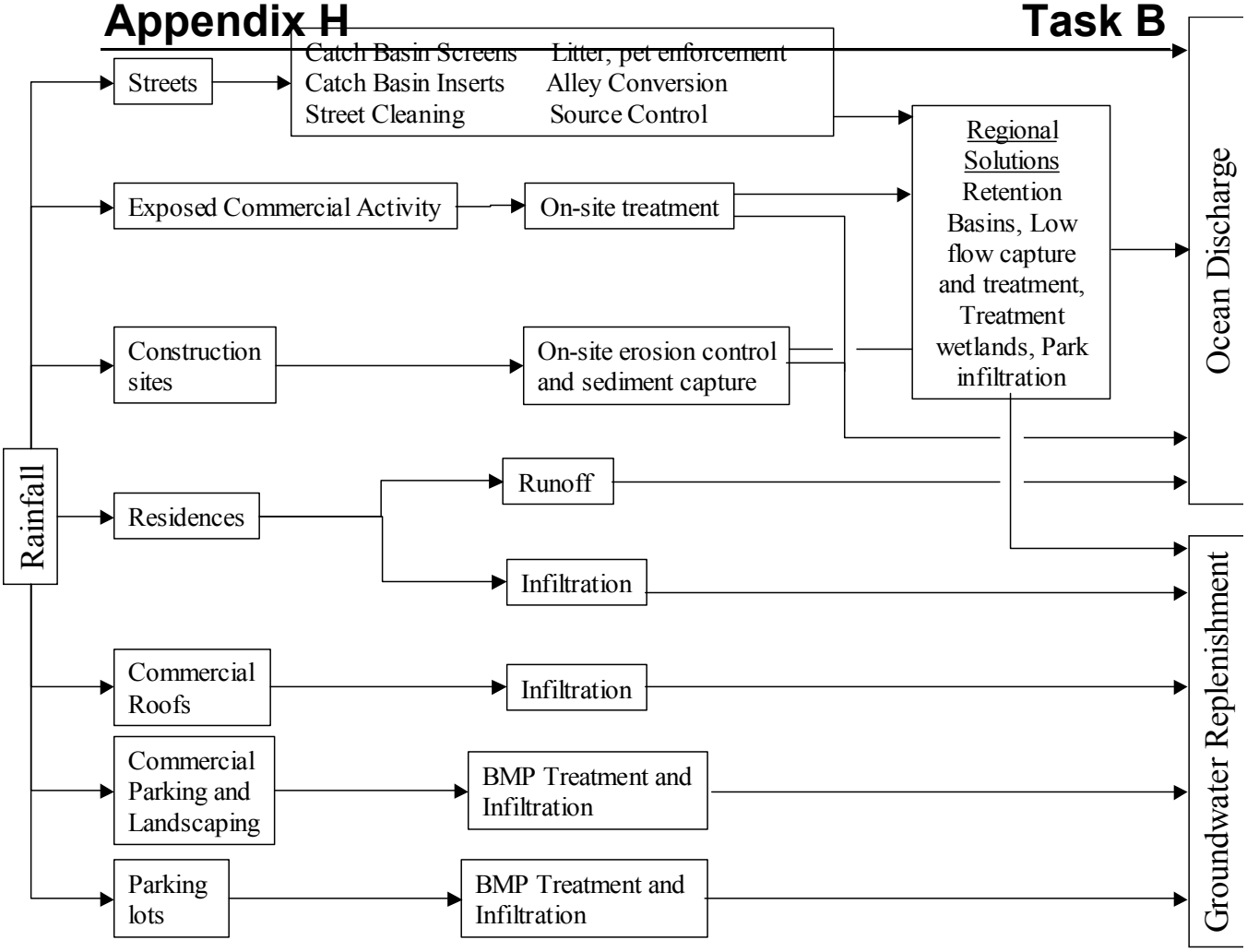

Figure 1. Stormwater quality control solutions for Southern California

Alleys for Public Use and Infiltration

Some alleys in urban areas are no longer necessary for access purposes. Indeed, many have become nuisance areas because of illicit trash disposal and criminal activity. Many of these could be gated and converted to small parks, with keys provided for local residents. They could simultaneously serve as infiltration facilities or as bioswales. There are currently 2.3 square miles of alleys in Los Angeles, for example. While many must be retained for access purposes, the fraction that could be converted could constitute a significant stormwater retention and infiltration resource. Alleys maintained for access might be candidates for partial or permeable pavements.

Similar approaches could be used for power line rights-of-way.

Exposed Commercial Activity

Very often the cheapest approach to stormwater quality control for exposed commercial activities is simply to cover them. Stormwater will thereafter come in contact only with the rooftop, and runoff will be much less polluted and more easily dealt with. However, for some large-scale activities, such as oil refining, it is not physically possible to provide a roof. For others, such as auto dismantling, the large area needed and the relatively low value of the activity may mean that a roof is not financially possible. Such facilities must be required to collect and treat runoff from their facilities, and indeed this is already being done in many cases. While there certainly are costs involved, it has generally proven possible, through a combination of better housekeeping, substitution of non-polluting materials, and simple on-site treatment processes, to solve these problems. Requirements for on-site treatment are advantageous because the cost of such treatment is borne by the business that produces the pollutant, providing incentives for conversion to less-polluting products and methods. Consequently, green manufacturing will become increasingly common.

Construction Sites

Release of sediments from construction sites can be ameliorated if the construction crew provides erosion control measures, such as maintaining vegetation or spraying exposed soil with polymer stabilizers, and an adequate on-site retention pond for rainfall, along with dikes, silt fences, and appropriate vehicle entrance construction to prevent runoff. Detention allows the sediments to settle out and the exposed soils can function effectively for groundwater recharge. It is anticipated that the costs of these measures will be small in comparison to construction costs. A more detailed list of best management practices for construction sites appears in Appendix I.

Residences

In most cases, homes and the surrounding landscaping have been designed to facilitate rapid runoff. It is necessary that water not pool in depths sufficient to flood houses, and ponding is viewed with irritation, even if it is harmless and temporary. However, single-family homes typically are surrounded with a significant area of land that could serve well for infiltration. Commonly, the land is planted or covered with

grass. The runoff from landscaping and residential rooftops typically contains only small amounts of pollutants that are readily removed by percolation through the root zone.

Landscaping for the typical single-family home could be arranged to infiltrate all of the rainfall that it receives (except, perhaps, in the most severe storms). Lawns a few inches below surrounding sidewalks could serve as infiltration ponds, gardens could receive roof runoff, and downspouts could conduct runoff to dry wells. Because the water would have had very little contact with pollutants, such infiltration would be an excellent addition to groundwater resources.

However, very few residences are arranged in this manner and, indeed, building codes often specify features that promote rapid runoff to the street. Building codes should be changed to utilize single-family homes as recharge sites. It is anticipated, however, that the effect on runoff will be seen only slowly in built-up areas as old homes are gradually replaced. Retrofit of existing homes will be expensive and politically difficult, but for new construction, single-family homes could be made to produce essentially zero discharge at little or no additional cost.

Xeriscaping—planting with native and other drought-tolerant plants—can also help to provide space for water infiltration, and it reduces watering and therefore the chance of irrigation runoff. Such landscaping also requires less fertilizer and pesticide, and so reduces incidental contamination.

In many cases, cities may be able to take interim steps to reduce runoff from homes. They have control over the "city strip" land that lies between the sidewalk and the gutter. It would be possible to institute a program of replacing the lawns after minor excavation, so that these areas would lie below the sidewalk and curb and serve as runoff detention and percolation basins.

Where infiltration is not possible, much residential runoff may be acceptable for direct discharge to the ocean, as long as it is not contaminated first by passing through polluted streets. More contaminated water can be conveyed to regional water cleanup and recharge facilities.

Low-flow Treatment in Wastewater Treatment Plants

Wastewater treatment plants are built with excess capacity in order to handle increased flow during rainy weather. While sanitary systems are designed to exclude stormwater, holes in manhole covers, leaks in piping, and illegal connections all allow the entry of some water during rainstorms. The flow is a very small portion of the rainwater, but can produce a significant increase in the much smaller sanitary flows—sometimes up to 50%. Treatment plants are designed with excess capacity to handle these peak loads.

This excess capacity can be used to treat dry weather runoff during periods when there is no rain. While these flows are not, by definition, stormwater, and indeed are governed by a separate set of regulations, dry weather runoff is often a significant contributor to impairment of receiving waters and its treatment would contribute to the objectives of stormwater control. It is also possible to use this capacity in concert with "street washing". In this approach, tank trucks filled with recycled water could be used to wash the streets, particularly in the months before the first rain of the fall. Contaminants removed from the streets and drains by the washing would be treated in the

wastewater plants, leaving the streets far cleaner when the rains came. At present, municipal street cleaning is a prohibited activity where it results in flows to the storm drain system.

This treatment approach for dry weather runoff could also treat runoff from small rainstorms.

It is likely that all of dry weather runoff could be treated for much of the Los Angeles Region. Such a step would eliminate essentially all runoff pollutants in the areas where this is possible. Because this approach uses capacity that is already in place, the cost for this alternative is low.

This approach would be particularly significant for control of coliforms. Sanitary treatment of dry weather flows would eliminate coliforms through much of the year. Rain occurs during only 32 days of the year, on average (Some of these storms are so small that the runoff could still be treated. On the other hand, untreatably high levels of runoff typically continue for a few days after a major storm). The LA Regional Water Board allows variances for 17 days of wet weather flow during the year. Thus it seems likely that dry weather runoff treatment at wastewater treatment plants, plus some degree of source control, plus the variances, will be sufficient to bring most areas into compliance with the bacteria rules. Further study, including some basic research on the sources of coliforms, is necessary to confirm this.

In considering the acceptability of this approach, it is important to note that beach use declines during wet weather, so that closures during the variance days would have a small effect on overall beach use and public health.

Capture and Use of Rooftop Runoff

In many cases, the pollutants from commercial rooftops, like those from residential roofs, could be readily removed by soil infiltration. With appropriate controls to avoid specific pollutants from commercial activities, roof runoff could be used for groundwater recharge. Designs exist for infiltration planters, in which the planter has high sides that allow it to function as a reservoir, and an open bottom that allows infiltrating water to pass into the soil. Risks of groundwater pollution could be mitigated through the use of biologically active and adsorbant soils. Commercial rooftops are commonly associated with large parking areas, which could be adapted for infiltration. Such efforts will be more difficult than those for homes, because most commercial facilities have a higher ratio of roof area to land area. In some cases it may be possible to store runoff for future irrigation use.

The Washington State Department of Ecology (2001) has developed a decision tree for dealing with downspout discharges. For lots larger than 22,000 square feet, it specifies either dispersion or infiltration systems for runoff. For smaller lots on suitable soil, infiltration systems are required. Where soils do not readily accept infiltration, surface dispersion may be appropriate. If water quality is good and infiltration and dispersal are not possible, disposal to the storm drains is accepted.

Parking Lots and Landscaping

Parking areas occupy a very large amount of land in Southern California, and accordingly represent a significant opportunity for improvement in stormwater

management. Construction costs for parking lots are far smaller per square foot than those for buildings, so that alterations are cheaper. They are reconstructed more frequently, so that requirements applying to new construction or reconstruction will propagate through the parking lot inventory much more rapidly than those for buildings.

In most cases, parking lots could serve as sites for rainwater infiltration. Trash can be collected on grates and be disposed of properly by the lot owners. The curbs around plantings (which are often necessary to avoid damage to the plants from cars) can be slotted so that water passes through them to infiltrate in the planter soils. Planted areas must be below grade, so that they collect and temporarily store water, and could be expanded, utilizing more space where cars don't actually park, such as the areas between and behind the parking bumpers. In some areas, permeable pavements could be used. Collected water could be passed to leach fields built under the parking lot.

An example of this sort of development is provided by the 6-acre parking lot of the Oregon Museum of Science and Industry (NRDC, 1999). It had originally been proposed as a traditional design, with water draining to catch basins, storm drains, and eventually the Willamette River. At the request of the Portland Bureau of Environmental Services, it was redesigned to use vegetated medians and landscaping as swales and linear wetlands. The parking lot is now able to infiltrate the water from a storm of 0.83 inches in 24 hours. Overall construction costs for the revised design were actually lower, because of the reduced costs for catch basins and drains.

Pervious pavements have also been developed so that even the space where cars are parked can be used for infiltration.

There is some concern over whether infiltration from parking lots will pollute underlying aquifers. Sediments, hydrocarbons, and trace metals are likely to be present in parking lot runoff from ordinary commercial establishments. But all of these are generally well retained on soils, particularly if the soils are selected to serve this purpose. Adsorbent materials might be added as a surface layer, to further retain hydrocarbons and trace metals.

It will be necessary to develop new guidelines for parking lots. The public and lot owners will not tolerate flooding that requires them to wade to their cars, so detention and infiltration systems will have to be carefully designed. Overflow will occur in extreme storms, and the lot and remediation areas should be designed so that the excess water flows to the street without impeding access to parked vehicles. Redesigned lots can be required for any new construction or for major renovations, but complete retrofit of all lots is likely to be too expensive for political acceptance.

This will require some additional maintenance. If adsorbants are included in the recharge areas to help control hydrocarbon infiltration, for example, these will have to be renewed from time to time. Regular trash collection will be required.

It is anticipated that most parking lots could become zero runoff areas, contributing substantially to water conservation and pollutant remediation. Further, very large parking lots, such as those at "big box" stores and shopping malls, could be reconstructed as stormwater infiltration facilities serving surrounding neighborhoods. In a cap and trade system, the lots would become financial opportunities for the retailers.

River Greening

The Los Angeles Region has become infamous for its historical conversion of rivers to concrete-lined flood control channels. While these have served the purpose of moving water rapidly to the ocean and avoiding flooding, they have also prevented infiltration in the riverbed. For this and many other reasons, advocates have proposed "greening" the river. This would involve widening the river at some points and replacing the steep concrete walls with gently sloping vegetated shores. Parks and wildlife habitat could be developed alongside the river, designed such that they would flood when the river is high. This would allow infiltration to occur, and by providing temporary storage, would decrease peak flood flows. In many areas it may be possible to replace the concrete bottoms of rivers with permeable surfaces.

The Sepulveda Dam Recreation Area is an excellent example of such a facility. It stores water during heavy rains, but serves as a park and wildlife refuge during the greater part of the year when it is not flooded. It promotes infiltration of water during rain events.

Certainly, any such modifications of the rivers must be designed carefully so that flood risk is not increased. But this is clearly possible. Indeed, increased infiltration and storage capacity along the river will reduce peak flows and therefore the frequency of floods, and reduce the associated costs.

Infiltration in Residential Streets

Many areas in Southern California are primarily residential, and runoff from these areas is only moderately polluted—it could be used for direct infiltration without treatment. In newly developed areas, homes could be designed so the runoff is near zero. However, many areas are currently already built out. In these, preventing runoff to the street would be expensive. In many cases, it may be possible to install infiltration devices in the public streets.

Infiltration in Parks

Public parks, in most cases consisting predominantly of grassy areas, are already contributing to groundwater infiltration. However, some portions still contribute to runoff, and could be regraded to collect water rather than shedding it. Indeed, many could be rebuilt to serve as groundwater infiltration systems serving surrounding areas. Playgrounds could be sunk below surrounding areas in order to collect water during rainfall events. Designs would have to include provision for infiltration at acceptable rates—water left standing for days could become a nuisance. In some areas, soil conditions might preclude this approach.

During the few days after water is collected and before it percolates, that area of the park will be unavailable for other uses. However, parks are little used during rainy weather in any case, and detention will only occur on a few days each year, so the interference will be minimal.

Public Facilities

Runoff from public facilities could be reduced by many of the measures previously discussed. Parking lots could be used for infiltration and rooftop runoff could

go to planters serving as infiltration systems. Retrofit of government facilities could begin more quickly than for individual homes, as part of the effort required to meet regulations.

PRIMARY BENEFITS OF RUNOFF QUALITY CONTROL

The immediate purpose of runoff quality control is protection of the receiving waters. In the Los Angeles Region, this refers primarily to rivers, coastal wetlands, bays, and the ocean. Many benefits are definable.

Fishing

Pollutants in stormwater can adversely affect fishing. Commercial fishing is a small and declining industry in the waters local to Southern California, but sportfishing remains a significant activity, bringing income to coastal businesses and providing recreational opportunity for many people. Cleanup of stormwater will preserve and enhance this activity by ensuring that fish are safe for consumption and by preserving fish breeding grounds in estuaries.

Swimming

Ocean swimming, as part of a visit to the beach, is a recreational activity enjoyed by millions of people each year in Southern California. It attracts tourists who contribute substantially to coastal economies. It is discouraged if trash litters the beach or if fear of disease discourages water contact. It is prevented entirely in the event of beach closures, which are a common result of polluted stormwater runoff.

Boating

Powerboats and sailboats are widely used in Southern California and represent a substantial industry in manufacture, maintenance, provision of slips, and various associated shoreside activities. Polluted waters, particularly in the form of trash, can significantly degrade the quality of the boating experience.

Noncontact Recreation and Nonconsumptive Wildlife Uses

Some recreational activities involve bodies of water without contact: sitting or bicycle riding along rivers or lake shores are examples. These activities are seriously degraded if the water produces bad odors or is littered with trash. A stormwater quality program will protect and enhance these uses.

Observation of wildlife is often a valuable part of the outdoor experience. Continuation of this activity requires water quality sufficient to support birds and animals and the plants and insects that they eat. Many migratory birds are dependent on local bodies of water for their sustenance during their yearly movements.

Reduced Illness from Contaminated Seafood

Some illnesses are transmitted through consumption of contaminated seafood. Control of the microbiological quality of runoff waters will reduce the extent of such illnesses.

Reduced Illness from Swimming in Contaminated Waters

Recent studies have indicated that people swimming near storm drains are more likely to contract waterborne diseases than those swimming far from storm drains. Microbiological control of runoff quality, particularly through sanitary treatment of dry weather flows, could reduce the incidence of these diseases.

Enhanced Esthetic Values

The trash cleanup associated with stormwater quality control will improve the appearance of our harbors, rivers, streets, and commercial establishments. Esthetic enjoyment of wildlife habitats such as wetlands, in particular, is hindered if trash is present.

Preservation of Natural Ecosystems

Polluted urban runoff damages natural ecosystems in many ways: toxic material can sicken or kill organisms, trash can choke marine mammals or birds, additional turbidity can prevent the penetration of light necessary for seaweed growth, sediment can bury habitats and prevent attachment of organisms to rocky surfaces, and nutrients can fertilize overgrowth of mosses and plankton. This damage can be prevented by stormwater quality control, and is one of the prime reasons for the program.

SECONDARY BENEFITS OF STORMWATER QUALITY CONTROL

Urban runoff comes from a huge variety of sources and contacts much of the environment around us. The efforts made to clean up runoff, which have the primary purpose of preventing water pollution in receiving waters, will have many secondary benefits and these should be included in any cost-benefit analysis. Indeed, some of these benefits are so substantial that they suggest the agencies responsible for the resources in question should also be providing financial support for runoff quality control efforts.

Groundwater Restoration

Total rainfall in the Los Angeles basin in an average year is equal to about half of the amount used for drinking water supply. It is strange indeed that we pollute this water and discharge it to the ocean even as we import ecologically, politically, and financially expensive water from the Colorado River, Northern California, and the Owens Valley. The primary difficulty in making productive use of this water is the lack of storage capacity. Rainfalls are infrequent but intense: most of the time there is no rainfall available for use, but occasionally it is so abundant that it causes flooding. Surface water reservoirs are the traditional solution to this problem—water is stored during the rainy season to prevent floods and becomes available for valuable uses the weather is dry. But there are few workable sites for large, year-round surface water reservoirs in the Los Angeles area. Groundwater aquifers, however, can also serve as water reservoirs, being drawn down in the dry season and replenished during the wet season. Infiltration will constitute a use of this storage capacity, reducing future dependence on outside sources of water and avoiding expensive alternatives like desalination of seawater. Because environmental and political factors may make increasing water imports impossible at any price, better utilization of local rainfall through the use of the groundwater reservoirs may be necessary for future growth.

Improvement of groundwater supplies within Southern California would save money now spent on imported water, and would save the concomitant external costs of the environmental impact on source areas. It would also reduce political friction with source areas. Ultimately, it may be the only economically and politically feasible method by which the water supply in Southern California can be increased, and as such, it may be the key to continued development in the area.

Flood Control

As the fraction of the Los Angeles Region occupied by impermeable surface has increased, the amount of water runoff has also increased, putting an ever-growing load on the flood control system. A recent project improved flood control for the lower Los Angeles River by increasing the height of the dikes on the channels, at a cost of about $200 million. Future increases in channel capacity would be even more expensive—not only will the walls have to be made higher, several bridges will have to be raised. Increased infiltration will reduce runoff, reducing the maintenance costs on the system and eliminating the need for further capacity increases.

The possible magnitude of the impact can be judged by considering the case of the San Gabriel Valley. Runoff from the valley is mostly captured in spreading basins in

the Whittier Narrows area and used for groundwater recharge. This makes the runoff coefficient for the valley overall 5%. In the urbanized areas of Los Angeles, the value is about 40%. Thus if the urbanized area were as well controlled as the San Gabriel Valley, runoff could decrease by a factor of eight. Flood risks would essentially disappear.

Increased Parkland and Wildlife Habitat

The regional alternatives for stormwater quality control include the development of parks and wetlands. The parks would serve as detention basins and infiltration facilities, but would be used for that purpose only during rainy periods, which comprise about 32 days per year in Southern California. During the rest of the year, these areas could serve the typical purposes for which parks are built, acting as recreational sites, playgrounds, soccer and baseball fields, and wildlife habitat. Because people are less likely to engage in these activities during rainstorms in any case, the conflict between the uses will be small. The Los Angeles area is notably short of public parks in comparison to other major cities, particularly in its poorer neighborhoods (Wolch et al., 2002). Because it is likely that residents will demand more park space in the future, the development of areas for dual use is particularly valuable. Ideally, the cost of development could be borne by both agencies intent on improving stormwater quality and by those responsible for parks and recreation. The planned redevelopment of the Corn Fields site in Los Angeles, for example, might provide a detention basin as well as the new park that is being planned.

Wetlands must be kept wet all year, but can withstand flooding during the rainy season. Thus reestablishment of these habitats, which have been largely lost in the Los Angeles Region, could simultaneously serve the purposes of wildlife restoration, flood control, and stormwater quality control. In many cases, it will be possible to develop wetlands within existing channels, reducing the need for additional land purchases.

Some of the parks and wetlands could be created as a part of river greening projects, and so would also serve the purposes of reestablishing esthetically appealing naturalistic rivers.

Improved Property Values from Trash Control

Often one of the most powerful visual cues that gives a visitor the perception of a "bad" neighborhood is the presence of trash on the streets. One approach to reducing pollutant discharge to storm drains will be improved enforcement of litter laws and additional street cleaning. These will have the secondary benefit of improving the appearance and livability of streets throughout the area. The "broken windows" campaigns of many police departments—indicating that improving the appearance of neighborhoods reduces crime—suggests that apparently cosmetic changes can have substantial benefits for neighborhoods. Certainly property values in a neighborhood with clean streets will be higher than they would if the streets are routinely littered with trash.

Reduction in Harbor Sedimentation

Sediments carried by runoff are moved because the water moves rapidly, and because small particles remain suspended in the low-salt-content chemical environment of fresh water. When runoff enters bays and harbors, however, the velocity of the water

is slowed, allowing the particles to settle to the bottom. The higher salt content of marine waters promotes flocculation of the small particles, so that most of them will also settle to the bottom. The deposited sediment fills channels, blocking the passage of ships and recreational boats, and filling areas set aside for preservation of aquatic ecosystems. Ultimately, harbor dredging is required, and frequently the collected sediment has been contaminated, so that it requires special handling. Dredging associated with storm drains in Los Angeles Harbor, for example, costs between $1 million and $3 million per year. Sedimentation in Upper Newport Bay is considered a significant threat to its function as a wildlife refuge. Stormwater quality control measures would avoid sediments discharges or remove it from the runoff, ameliorating these problems for downstream communities.

Improved Public Health

A significant portion of exposure to particulate air pollutants arises when small particles are resuspended from roadways by traffic and wind. Tire dust, settled air pollutant particles, pet feces, particles with adsorbed trace metals and trash are pounded into fine powder and lifted into the air. Such resuspension includes an ultrafine particle fraction, which is most dangerous to human health. More frequent street cleaning, particularly using vacuum bag type cleaners, would reduce public exposure to fine materials carrying trace metals, hydrocarbons, and microorganisms. Some public health improvement is likely, but its magnitude cannot be estimated.

REGIONAL PROGRAMS DESIGNED FOR STORMWATER QUALITY CONTROL

While there has been a substantial amount of work on individual facilities for runoff quality control, such as detention ponds and grassy swales, there have been only a few studies that have tried to determine the regional cost and effectiveness for a system of these "green solutions". It is important to ask whether it is possible to create an overall program within realistic constraints of land availability and costs that will bring the watershed into compliance with regulations.

We have sought descriptions of example projects that include overall costs and the area of land that drains to the facility, so that cost per square mile of area served can be calculated. In a few cases, these are area-wide systems that are the best evidence that an overall solution is possible. In others, they are single installations, for which we make the assumption that duplication is possible—ten facilities like the one described could be built to serve ten times the area. Because economies of scale are important in determining facility design and even regulatory policy, we have taken special interest in some sources that describe how the size of the drainage area (and the necessary BMP treatment facility) affects cost per square mile. Finally, we have included examples that have actually been built and tested, and others that have only been designed. While data for the latter may be less reliable, most systems perform as designed, and these designed-but-not-built systems provide some of the most useful results.

The chosen examples are described briefly below, and listed in Table 2. Results useful for determining the relationship between facility size and cost per square mile are plotted in Figures 2 and 3.

Area-Wide Systems

Sun Valley

The Sun Valley project was funded by Los Angeles County to develop an alternative approach for flood control and runoff quality management for the Sun Valley district. This is an urbanized area with considerable industrial development that currently does not have storm drains. It is consequently frequently plagued with flooding. The project was undertaken to determine whether there was an approach to flood control other than simply building storm drains.

Four alternative plans were produced, designed to maximize infiltration, to maximize water conservation and wildlife habitat, to maximize stormwater reuse by industry, and emphasizing conveyence to traditional storm drains. Notably, an alternative that maximized the use of onsite BMPs was rejected as too expensive. The components of the plans included industrial reuse, infiltration basins in parks, tree planting and mulching, infiltration in parking lots, and infiltration in vaults beneath the streets.

Because the emphasis of this project was flood control rather than water quality control, the hydraulic control objectives were quite stringent: the system was designed to collect and infiltrate all of the water produced by a 50-year, 96 hour storm. This means that the runoff from the area, if the project is built, will be reduced to near zero. Thus, this project, which includes flood control and water quality control, constitutes an "upper

bound" estimate on the costs for water quality control. Achieving such complete collection and infiltration would certainly substantially exceed water quality goals, and costs for a stormwater quality control system in an area with storm drains already in place would certainly be lower.

San Diego Creek

A project supported by the Irvine Ranch Water District and Orange County and performed by Geosyntec Consultants has developed a plan for natural treatment systems—wetlands and stormwater detention ponds—for the San Diego Creek watershed. This watershed occupies 120 square miles of developed land that drains into Newport Bay. Newport Bay has been designated as impaired, requiring that stormwater discharges be cleaned up.

Geosyntec proposed a plan consisting of 44 facilities, including ponds and wetlands constructed within existing drainage channels or built outside. These are typically facilities with both deeper open water and shallow water supporting emergent vegetation (such as cattails).

Water quality improvements expected from the system are described in the report (Strecker et al., 2002): "The NTS Plan is estimated to achieve total nitrogen (TN) TMDL for base flows and reduce in-stream TN concentration below current standards at most locations. Total phosphorous TMDL targets would be met in all but the wettest years. The fecal coliform TMDL would be met during the dry season, but not all wet season base flow conditions, and not under storm conditions. The NTS Plan is not designed to meet the sediment TMDL, but would capture, on average, about 1,9000 tons/yr (1,724,000 kg/yr) of sediment from urban areas. The wetlands are estimated to remove 11% of the total copper and lead, and 18% of the total zinc in storm runoff. The NTS provides a cost-effective alternative to routing dry-weather flows to the sanitary treatment system."

While final budget numbers were not provided, it was anticipated that the first 13 treatment sites would be constructed for $12 million, and that the overall cost would be substantially less that the $60 million anticipated for low-flow sanitary treatment. This value is listed as the upper bound of cost in Table 2. For comparison of cost vs. unit drainage area size, it was presumed that the average area served by each of the 44 facilities was 120 $mi^2/44 = 2.7\ mi^2$.

Constructed wetlands will collect any trash that enters the storm drain, and should be effective at reducing concentrations of coliform organisms, hydrocarbons, particles, and the suite of pollutants associated with particles. They may constitute a complete control system if they are combined with vigorous source control for metals and pesticides and storm drain screens to minimize the trash loading.

Murray City, Utah, Golf Course and Wetlands

Officials in Murray City recognized an opportunity when the interstate highway I-215 was being built. They agreed to take soil from the excavation and runoff water from the freeway to make a golf course. The links, with an associated string of settling ponds, accept and treat all of the drain water from the eastbound lanes of 4.5 miles of the freeway (NRDC, 1999; Hill, 2003). The golf course has been a commercial success, and now produces $900,000 in revenue against $450,000 in operating and maintenance costs each year. The city has created other treatment wetlands for essentially all of the runoff

from the City and from the westbound lanes of the freeway. The total cost of these wetlands has been less than $1,000,000. Overall, if the golf course infiltration system and the other wetlands are considered as a single stormwater control system, it pays for itself. Because this is an unusual circumstance, for calculation we ignored the income from the golf course, and presume the wetlands cost $1,000,000 and serve the area of Murray City, which is 9.5 mi^2.

Fresno Metropolitan Flood Control District

The Fresno Metropolitan Flood Control District serves the area including and surrounding the city of Fresno. It operates 130 infiltration basins that drain a region of about 120 square miles devoted to agriculture, residential areas, and urban landscape (NRDC, 1999; Pomaville, 2003). Some of the basins are turfed and serve as parks, while others are bare and serve seasonal infiltration needs. The basins succeed in infiltrating 80% to 90% of the stormwater in their drainage areas, and only 2% enters a receiving water without receiving some degree of treatment. To protect groundwater, the District also instituted a program of industrial inspections. While monitoring is still done to check for pollution of the San Joaquin River, the District anticipates no additional infrastructure will be necessary to meet water quality control regulations. For calculations, the unit area for each basin was assumed to be 1 mi^2.

Individual Systems

Long Lake Retrofit, Littleton, Massachusetts

Geosyntec Consultants also designed a low-impact-development program for Littleton, Massachusetts (Roy et al., 2003). The 1.5-square-mile watershed that contains the town drains into Long Lake, which has been subject to eutrophication and other water quality problems associated with urban runoff. The storm drain system collects water at 200 catch basins and releases it to the lake through 18 outfalls. The plan for mitigation of the problem includes a treatment wetland, grass and vegetated swales, bioretention cells (swales with underdrains), rain gardens, rain barrels, and an outreach program to promote source control for fertilizers.

The total budget for the project is estimated at $630,000, or $420,000 per square mile.

Tule Pond, Alameda, California

The Tule Ponds project is a group of three treatment wetlands that was constructed using information developed in the Demonstration Urban Storm Water Treatment Marsh in the early 1980s. It receives urban runoff, passing it through the three ponds in series and discharging it to an existing natural pond. It serves a drainage area of 0.8 square miles and cost $360,000, for a cost of $450,000 per square mile.

Treasure lsland, San Francisco Bay

Treasure Island is an artificial island of 403 acres in San Francisco Bay that was used for many years as a Navy base. It has recently been converted to residential use. A treatment wetland is planned as the means for stormwater quality control. It is anticipated that wetland construction will cost $800,000 to $ 1,100,000 (Bachand, 2003), or $1.2 million to $1.7 million per square mile. However, the island is a tourist destination, and it has been estimated that the increase in visitor spending associated with

the wetland could be $4 million to $11 million (Fine, 2003). It was also estimated that the overall value of the project could be twice these values.

Herrerra Study of Stormwater Regulations Costs

As a part of the effort to determine the costs of complying with stormwater regulations in Western Washington, Herrerra Environmental Consultants (2001) prepared designs for typical projects needed to contain and treat stormwater on site in small projects of new construction. In both cases, the systems were planned for a 1.7-inch rainfall. The first hypothetical project was a ten-acre residential development with 40 individual home sites. It was presumed that runoff from the homes would be collected in a detention pond. Construction of the permanent facilities was determined to cost $240,000 to $230,000, depending on the quality of soils. This is about $15 million per square mile.

The second hypothetical site was a restaurant built on a one-acre site, with the area not occupied by the building used as a parking lot. Runoff was to be collected in subsurface infiltration vaults. Costs were determined to be $280,000 or $570,000, depending on the permeability of the soil, or $175 million to $356 million.

Dover Mall, Delaware

The Dover Mall has 30 acres of parking lot or otherwise impermeable surface. Runoff drains to a wetland that is sized to retain a 1-inch rainfall (NRDC, 1999). It includes a forebay that allows containment of exceptional spills. The total project cost was $171,000 (although much of this was defrayed by in-kind donations). The wetland is considered a considerable esthetic resource. The cost was $3.5 million per square mile.

Oakland Park Industrial Area, Florida

A BMP treatment system was developed for five acres of Oakland Park that included auto repair shops, paint shops and plating facilities. A short treatment train was developed, including a trash removal basin and absorbent media. The system cost $261,000, and was successful in removing 71% to 95% of oil and grease, along with all trash and most sediment. Costs were $33 million per square mile of drainage.

Clear Lake Packed Bed Wetland Filter System

Clear Lake, in Orlando, Florida, receives runoff water from 121 acres of nearby urban land and water quality in the lake has deteriorated significantly as a result of pollution. Packed beds, consisting of 10 filter beds composed of crushed concrete or granite media with growing aquatic plants, allow removal of sediments and nutrients. An initial wet detention pond is used to contain the first flush. The system cost $917,646. In calculations, the system was considered a single installation treating 121 acres of drainage. Costs were $4.6 million per square mile.

Sand Filters in Alexandria, Virginia

Two sand filters were built to treat runoff from an airport parking lot near National Airport in Alexandria, Virginia. The area drained was 1.95 acres, and the filters cost $40,000. While some initial problems with anaerobic conditions were encountered, the filters eventually achieved good treatment. The cost, calculated from the data reported by FHWA (2003), was $12.9 million per square mile.

Compost Filter Facility, Hillsboro, Oregon

A compost filter was constructed to decontaminate water upstream of a grassy swale. The treatment train received water from a five-lane highway, draining a total area of 74 acres. The 1200-square-foot filter contained 120 cubic yards of compost and was constructed and filled for $13,700. The cost, not including the swale, was thus $110,000 per square mile of drainage area.

Infiltration Trenches

The Federal Highway Administration (FHWA 2003) has estimated the costs for constructing infiltration trenches as $C_A = 1317 \times V^{(0.63)}$ where C is the cost in dollars and V is the volume in cubic meters. Calculations for this report are made assuming the need to provide detention for a ¾-inch storm. For one square mile (2.6×10^6 m^2), a ¾-in rainstorm will produce 5×10^4 m^3 of water. The cost per square mile is equal to the cost for each trench divided by the drainage area it serves, or $C_{mi2} = C_A/A = (1/A) \times 1317 \times V^{(0.63)} = 1.2 \times 10^6 \times A^{(-0.37)}$. The total cost for these systems thus declines as each system becomes larger—there are economies of scale. Costs for land are not included, but it is likely that trenches could be installed in land also used for other purposes. In some cases it might be necessary to collect more than ¾ inch of rain. On the other hand, the calculation assumes that no infiltration occurs in the trench during the storm. Also, this presumes that the runoff coefficient for the area served is 1.0—thus the typical systems described could treat a ¾-inch storm on totally impervious area or a 1.5-inch storm on an area with a runoff coefficient of 0.5, which is a commonly observed value. Thus the total seems a reasonable approximation.

Infiltration Basins

The Federal Highway Administration (FHWA 2003) has estimated costs for construction of open infiltration basins (dry basins) as $C = (V/0.02832)^{(0.69)}$, where C is the cost in dollars and V is the volume in cubic meters. As for the infiltration trenches, it is assumed the basins will be designed to treat a ¾-inch storm in an impervious drainage. Thus the cost per square mile is $C_{mi2} = C_A/A = (1/A) \times (V/0.02832)^{(0.69)} = 204{,}000 \times A^{(-0.31)}$. Costs for land are not included, and would be substantial. However, the basins could be used for other purposes for much of the year. Again, the systems assumed could treat a 1.5-inch storm in a drainage area with a runoff coefficient of 0.5.

Bioretention Areas

Stormwater can be collected in areas filled with highly permeable soils and planted with trees and other vegetation. Water that infiltrates is filtered by contact with the soils and may continue to move downward to replenish the groundwater. Much of it will also be taken up by the vegetation and returned to the atmosphere through evapotranspiration. The FHWA (2003) cost estimate for these bioretention areas is $10,000 per impervious acre, or $6.2 million per square mile of impervious watershed. Bioretention areas can readily serve multiple purposes as wildlife habitat and parks.

Detention and Retention Wetlands

The Federal Highway Commission Report (FHWA, 2003) has provided a general formula describing the cost of detention ponds as a function of size. Costs were estimated as $C_A = 168 \times V^{(0.699)}$, where C_A is the cost in dollars and V is the volume of the pond in cubic meters. The cost per square mile is $C_{mi2} = C_A/A = (1/A) \times 168 \times V^{(0.699)} =$

$324{,}000 \times A^{(-0.301)}$. Land costs are not included, but these areas can serve other purposes during the larger part of the year when the weather is dry—they can be parks, wildlife areas, and playing fields.

Detention Vaults

In highly urbanized areas, water can be detained in underground vaults, which may be made of concrete or of corrugated steel pipe. Such systems primarily store water to avoid flooding or excessive hydraulic load on downstream systems, but some sedimentation may occur. This provides marginal treatment, but also requires that the vaults be cleaned out on a regular basis. The FHWA estimate for costs of such systems is $C = 38.1 \times (V/0.02832)^{(0.6816)}$. Cost per square mile of drainage area is $C_{mi2} = (1/A) \times 38.1 \times (V/0.02832)^{(0.6816)} = 690{,}000 \times A^{(-0.3184)}$.

Underground Sand Filters

Sand filters are quite effective at removing particulates from urban stormwater, and are commonly employed upstream of other systems in order to protect them from excessive sedimentation. They can be installed underground in densely urban areas, but are correspondingly expensive. The FHWA estimate for such systems is $10,000 to $14,000 per impervious acre served, or $8.7 million per square mile. Here we have chosen the upper estimate because costs are likely to be high in the Los Angeles area.

Surface Sand Filters

Sand filters may also be constructed at the surface, which reduces their cost. However, they occupy a relative large amount of land area, and cannot contribute to a secondary use. There are strong economies of scale. For facilities serving more than 5 impervious acres, the FHWA estimate of cost is $3,400 per acre or $2.1 million per square mile.

Dry Swales and Filter Strips

A vegetated dry swale is an area of land shaped so that stormwater flows through it in a broad, relative flat stream. Flow through the grass removes sediments from the water. At the same time, significant amounts of infiltration may occur. It may be necessary to prepare the soils to maximize infiltration before the grass is planted. Swales can be used for other purposes during the periods when it is not raining. The FHWA estimate of construction costs for swales is $1500 per impervious acre, or $930,000 per square mile.

Filter strips are similar installations, in which the water flows as a flat sheet. The FHWA estimate of constructions costs for filter strips is $2000 per acre or $1,240,000 per square mile.

Results from the ASCE-EPA BMP Database

A cooperative effort of the American Society of Civil Engineers and the U.S. Environmental Protection Agency has compiled data on the success of best management practices. Data were carefully vetted, put as much as possible in common format, and arranged so that they could be searched according to several parameters. Several searches of the database were done to gather data for this study.

A search for dry detention basins, serving watersheds of 0-100,000 acres, with 0-30 in annual rainfall, produced 17 responses, of which only four included cost data. All

of the four were associated with freeways and served small watersheds of 1-14 acres. This may be the reason why costs were exceptionally high.

A search for wetlands, serving watersheds of 0-100,000 acres, with 0-30 in annual rainfall, produced 10 responses, only one of which included cost data. Costs for this facility were exceptionally low. It was described as a "natural" wetland, perhaps implying that much of the system was already in place before construction was done.

A search for wetlands, draining 0-100,000 acres, with 0-30 in annual rainfall, produced 9 responses, including 6 with cost data. These also served very small watersheds, and costs per square mile were very high.

A search for hydrodynamic devices serving 0-100,000 acres, in areas of 0-30 in annual rainfall, produced 12 responses, including 8 with cost data. Costs ranged from $344,000 per square mile to $86 million per square mile, showing very strong economies of scale.

A search for grassy swales serving 0-100,000 acres, in areas of 0-30 in rainfall, produced 26 responses, including 7 with cost data. The cost per square mile ranged from $12 million to $341 million, and showed strong economies of scale. This was a surprising result—grassy swales are very simple and cheaply constructed systems—but it reflects the fact that each installation serves only very small areas.

ESTIMATES OF COSTS AND RECOMMENDED APPROACH

Ultimately, stormwater pollution is a symptom of two anthropogenic changes: we are releasing pollutants into our local environment, and we have disrupted the hydrologic cycle of the Los Angeles Region by covering the soil with impervious surfaces. These changes have other symptoms as well. Local pollution impairs health, damages the esthetic quality of life, and reduces property values. Reducing infiltration increases runoff rates and the risk of flooding, and at the same time, reduces recharge of groundwater resources. Finally, impervious surfaces cannot support vegetation, and we suffer the loss of natural habitat, recreational areas, and aesthetic value of green space.

Cost Estimates

The solution proposed in the report by Gordon et al. (2002)—advanced treatment plants to clean up stormwater after it has entered the storm drains—constitutes treatment of a single symptom without correction of the fundamental problem. It is expensive, and has little benefit beyond the single objective of protecting receiving waters. A more fundamental approach—eliminating pollutant releases and restoring the hydrologic cycle—is cheaper. Further, because it will mitigate all of the effects of pollution and hydrologic disruption, it will have benefits whose value exceeds the costs.

While a rudimentary cost-benefit analysis is attempted here, the limitations of such an approach should be kept in mind. Many costs and benefits are difficult to evaluate—the psychological benefit to citizens who live on a clean street rather than a trashy one, for example, or the long term effects on local business of a general perception of regulatory burdens. In past cost-benefit analyses, it has been common that costs and benefits that are difficult to measure have been assumed to be zero, certainly producing misleading results. It remains true that two good-faith investigators can produce quite different cost-benefit results, especially for a complex problem like stormwater quality control. Assumptions may depend greatly on the value system of the investigators. A recent cost-benefit study was criticized, for example, because it put a lower value on the lives of elderly persons. This is reasonable in the sense that the death of and older person represents fewer years of life lost, and less loss of earnings, and it is a common presumption in cost-benefit studies. However, there was outrage among those who felt that this approach was offensive to the elderly and the general principle that we all have equal rights.

In this particular study, because the costs and expenditures are of many different kinds, it was necessary to use a variety of estimation methods. The results are necessarily approximate, and comparisons among them must be viewed with caution. To use technical terms, contingent valuation studies are included with benefits transfer estimates, and results from various investigators are combined. We anticipate that these steps may be criticized, but we hope that we can provide a framework approach that can be improved and refined as further research is done.

Finally, cost-benefit analysis frequently ignores the issues that arise because the costs and benefits are not borne by the same parties. One might suggest that pollution should not be cleaned up if the cost of doing so exceeds the benefits of relief from the pollution. But it is commonly the case that the polluter who is saving money is not the

same person who is suffering from the effects of the pollution. Does your neighbor have the right to throw his trash in your yard if he can show that it saves him more money than it costs you? The principle of "polluter pays" has a satisfying moral aspect and it also puts the incentives right—the parties with the ability to reduce pollution are given the motivation to find a way to do so.

For these reasons, and because in this short study the numbers are particularly only estimates, we present our cost benefit analysis with the caution that more precise and detailed assessments are desperately needed.

Cost estimates have been prepared by examining case studies. Reports were chosen where information was available for both the total cost of the system described and the land area served, or the initial stormwater retention volume, in order to calculate the cost of stormwater management per square mile of watershed. Several assumptions and caveats must be observed:

1. In the cost-per-square-mile calculations, no attempt was made to adjust costs on the basis of the amount of rainfall in the watershed. Sufficient data were generally not available for this purpose. In most cases, data came from areas where annual rainfalls are greater than in Los Angeles, and this may cause the cost estimates to be high.
2. In the cost-per-square mile calculation, the cost data were not available in a uniform format. It was not possible to calculate an accurate "present worth" including operations and maintenance costs for each case. In some cases operations and maintenance data were included, while in others they were not. In most cases operations and maintenance costs are low in comparison to installation costs, and they would be further reduced by discounting to present worth. Never the less, this may cause the cost estimates to be low.
3. Installation costs may vary depending on the slope of the land, the nature of the soils, depth to water table, local labor costs, and a wide variety of other factors that change with locality. No attempt was made to adjust the costs for these factors, and this may make the estimates high or low.
4. It is presumed that the systems described will be sufficient, in conjunction with source control efforts, to comply with water quality regulations. There was no case reported in which the quality control efforts were described as failing, or for which regulators asked for additional measures after the systems were complete. However, few data were shown for after-construction water quality, and most of the systems have not been in place for enough time to allow long-term assessment. The degree of success for source control efforts, while likely to be substantial, cannot be guaranteed.
5. Several of the projects described have been designed, but not implemented. It is assumed that they will perform as designed. In the case of the Federal Highway Administration formulas, these are regression results rather than individual case results.
6. It is likely that implementation in the Los Angeles area would involve projects that are larger than most of those listed. There likely will be economies of scale. This may cause the cost estimates to be high.

Summary of Case Study Project Costs
"I or D" refer to Implemented or Designed

Project	I or D	Description	Unit Size, square miles	Cost, $M	Cost, $M per square mile
Infiltration Systems					
Fresno Metropolitan Flood Control District Regional Infiltration Basins (NRDC, 1999; Dave Pomaville, 2003)	I	130 turfed or unturfed infiltration basins serving residential areas. Treats or infiltrates 98% of runoff over area of 120 square miles	1		2.5 to 3.7
Study of Stormwater Regulations Cost (Herrerra Environmental Consultants, 2001)	D	Hypothetical calculation of costs for new residential development	0.016	.24	15
Study of Stormwater Regulations Cost (Herrerra Environmental Consultants, 2001)	D	Hypothetical calculation of costs for new commercial development	0.0016	0.28 to 0.57	175 to 356
Wetlands					
Tule Pond, Alameda (Wetzig, 1999)	I	Stormwater treatment pond for urban runoff	0.8	0.36	0.45
Treasure Island, San Francisco Bay (NRDC, 1999: Galvanis, 2003)	D	Wetland treatment system for local runoff	0.65	0.8 to 1.1	1.2 to 1.7
Long Lake Retrofit, Littleton, Mass. (Roy et al., 2003)	I	Swales, constructed wetlands, bioretention cells, outreach	1.5	0.63	0.42
San Diego Creek Natural Treatment System Master Plan (Strecker et al., 2003)	D	Network of open-water ponds and wetlands in Newport Bay drainage, 120 square mile area	2.7	<60	<0.5
Murray City, Utah (NRDC 1999: Hill,	I	Golf course and wetlands treat runoff from 4.5 miles of I-215	9.5	1.0	0.11

2003)		and the city			
Dover Mall, Delaware, (NRDC 1999)	I	Wetland installed on mall grounds drains 30 acres of 100% impervious cover	0.048	0.17	3.5
Sun Valley Project, Los Angeles County	D	Combination of various measures for flood and quality control in L.A. Basin	4.4	172 to 297	39 to 68
BMP Treatment Processes					
Oakland Park, Fla, industrial area (NRDC 1999)	I	Oil, grease, sediment, and trash removal by sedimentation and absorbance	0.008	0.261	33
Clear Lake Packed Bed Wetland Filter System (NRDC 1999: FHWA, 2003)	I	Oil, grease, nutrients, trace metal removal for water entering Clear lake	0.2	0.92	4.6
Compost Filter Facility, Hillsboro, Or. (FHWA, 2003)	I	Oil, grease, removal and filtration for highway runoff	0.12	0.12	0.11
Alexandria, Va, airport parking lot	I	Sand filters installed along the borders of a 1.95-acre parking lot	0.003	0.04	12.9
Bioretention Areas, FHWA cost estimate	D	Areas of highly permeable soil planted with trees and other vegetation			6.2
Underground Sand Filters	D	Porous medium filters placed in underground vaults, appropriate for highly urban areas			8.7
Dry Swales	D	Broad, shallow vegetated drainways covered with vegetation, usually grass			0.93
Surface Sand Filters	D	Porous medium filters installed at the surface			2.1
Filter Strips	D	Flat vegetated drainways covered with vegetation, usually grass			1.2
Port of Seattle container area cleanup	I	High quality street sweeping with sediment trap catch basins			3.1
Cost:Area Formulas from FHWA					
Infiltration trenches, FHWA cost estimate	D	Gravel-filled trenches. Infiltration eliminates runoff discharge.	$C_{mi2} = C_A/A$ $= (1/A)\times 1317\times V^{(0.63)}$ $= 1.2\times 10^6 \times A^{(-0.37)}$		

Infiltration basins, FHWA cost estimate	D	Open basins, dry at most times, store and infiltrate runoff. Infiltration eliminates runoff discharge.	$C_{mi2} = C_A/A$ $= (1/A)\times(V/0.02832)^{(0.69)}$ $= 204{,}000\times A^{(-0.31)}$		
Detention and retention wetlands, FHWA cost estimate	D	Wetlands used for treating stormwater, with storage capacity available	$C_{mi2} = C_A/A$ $= (1/A)\times 168\times V^{(0.699)}$ $= 324{,}000\times A^{(-0.301)}$		
Detention vaults, FHWA cost estimate	D	Underground reservoirs for storage of runoff to reduce peak flows	$C_{mi2} =$ $(1/A)$ $\times 38.1\times(V/0.02832)^{(0.6816)}$ $= 690{,}000\times A^{(-0.3184)}$		
Results from ASCE-EPA BMP Database					
Dry Detention Basins					
I-605/SR-91 EDB	I		0.0013	0.077	60
I-5/Manchester (East)	I		0.0077	0.33	43
I-5 SR 6	I		0.0085	0.14	17
I-75/SR-78 EDB	I		0.022	0.82	38
Wetlands					
Swift Run Wetland	I		1.95	0.049	0.025
Sand Filters					
I-5/SR-78 P&R	I		0.0013	0.22	170
Escondido MS	I		0.0013	0.45	348
Eastern Eastern Regional MS	I		0.0024	0.34	141
Foothill MS (Sand Filter)	I		0.0029	0.48	164
Termination P&R	I		0.0045	0.46	102
LaCosta P&R	I		0.0045	0.23	49
Hydrodynamic Devices					
Jensen Precast (UVA)-Phase II	I		0.00045	0.039	86
I-210/Orcas Avenue	I		0.0018	0.04	22
Jensen Precast, (Sacramento)	I		0.0032	0.062	19
I-210/Filmore Street	I		0.0040	0.05	12
Charlottesville Stormceptor	I		0.0040	0.017	4.2
Sunset Park Baffle Box	I		0.040	0.023	0.57
Indian River Lagoon CDS Unit	I		0.098	0.055	0.56

Austin Rec Center	I		0.15	0.05	0.34

OSTC					
Grassy Swales					
I-650/SR-91 Swale	I		0.00032	0.11	341
Cerrito MS	I		0.00065	0.06	93
1-605/DelAmo	I		0.0011	0.13	115
I5/I-605 Swale	I		0.0011	0.073	64
Monticello High School	I		0.0013	0.015	11
SR-78 Melrose Dr	I		0.0039	0.13	34
I-5 North of Palomar Airport Road	I		0.0074	0.14	18
I-650/SR-91 Swale	I		0.00032	0.11	341

Economies of Scale

The costs listed in Table 2 reflect the cost for an individual facility ("Cost, $M" and "Cost, $M/mi^2") and associate it with the drainage area served, referred to as the "Unit Size". The costs per square mile for the individual units can be plotted to determine the effects of unit size (Figures 1 and 2). While there is a great deal of scatter in the data, it is clear that there is considerable economy of scale. Units serving drainages of a half square mile are typically 30% more expensive that those serving 1 square mile. Those serving drainages of one-tenth square mile are twice as expensive and small installations are extremely expensive in dollars per square mile. The most notable example of this is grassy swales: while each unit is relatively inexpensive, their small service areas make them very expensive per square mile served.

For some of the BMPs there are not sufficient data to judge the economies of scale, and as described, all of the data must be taken as approximate. Never the less, it seems that there is a good case to suggest that regional systems for handling runoff water will be most economical. This is clearly true of wetlands and infiltration basins, which are likely to be the most widely used approaches in the Los Angeles Region as a whole. This supports the position that the best solution will be a wetland or an infiltration basin also serving as a park, playing filed, or wildlife habitat as the stormwater management unit for a neighborhood of a square mile or greater.

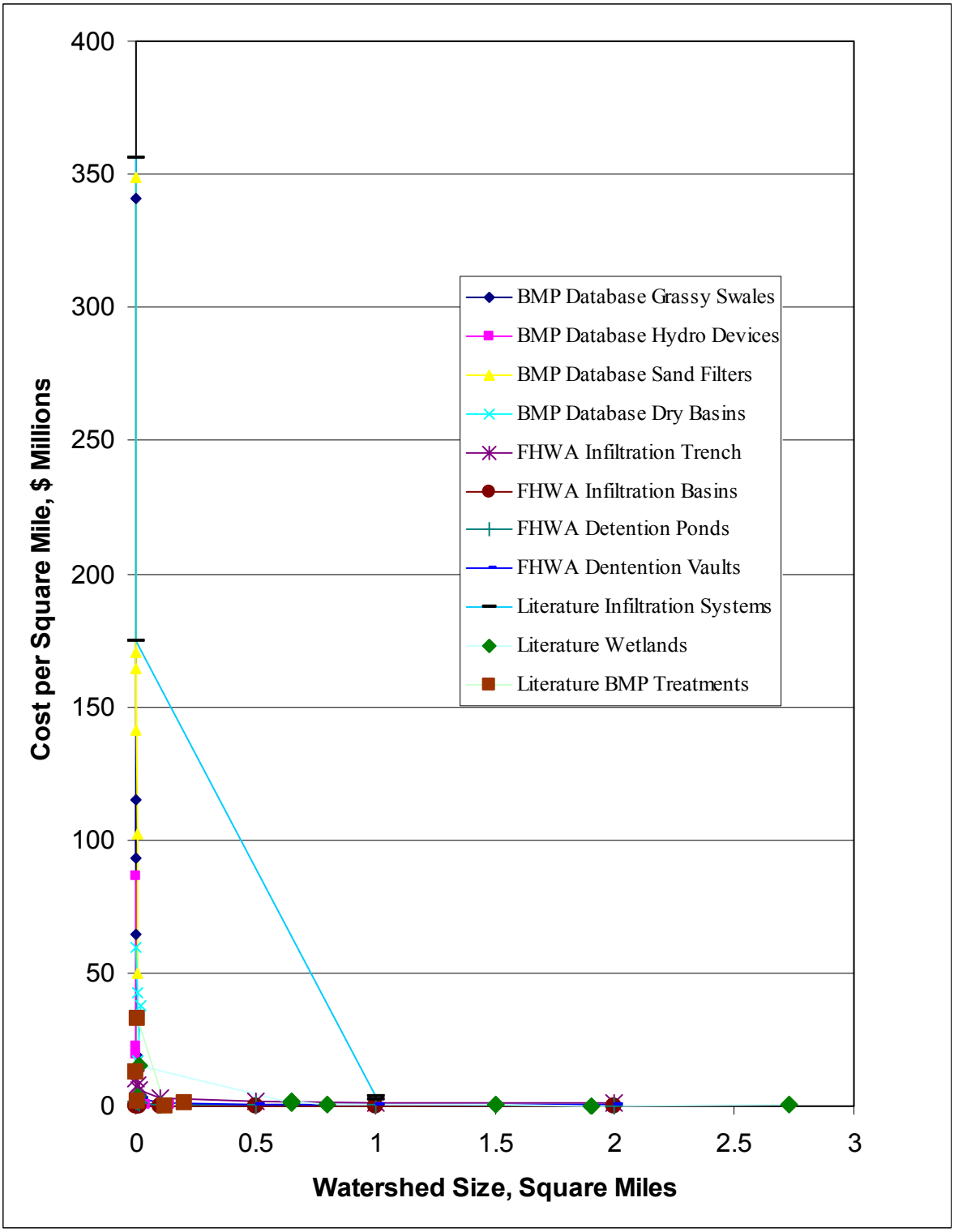

Figure 1. Plot of data for which costs per square mile and unit areas are known.

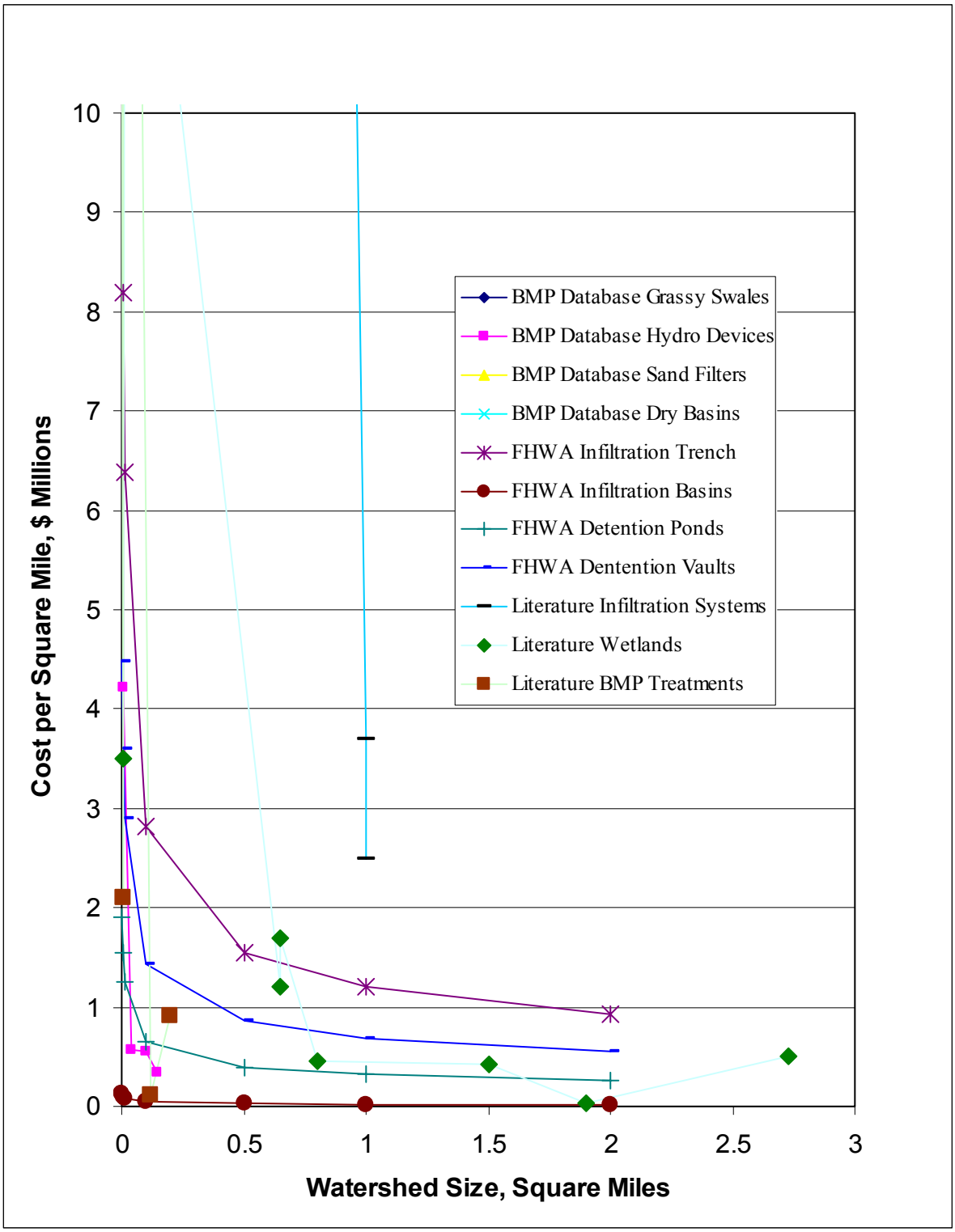

Figure 2. Cost per square mile versus unit size. Data are the same as those shown in Figure 1, but the axes have been magnified to show detail near the origin. Many data points fall outside of the plot.

Overall Costs of Stormwater Quality Control

It remains very difficult to produce an estimate of the total costs for complying with regulations in the Los Angeles Region. While there is substantial information on individual units that have been designed or implemented elsewhere, local factors are likely to make costs different in the Region. In most cases, it seems likely that costs in the Los Angeles Region will be higher than those reported elsewhere because land and labor costs are higher. Therefore, where a range of values is given, we have chosen the higher numbers.

This difficulty is compounded by the great variability in the data reported. To give just one example, the Federal Highway Administration formula estimates the cost of an infiltration basin needed to serve one square mile as $200,000. At the other extreme, the Herrerra Consultants report said that a detention/infiltration system for a residential area would cost $15 million per square mile. In preparing our total estimate, we have avoided using data that seem like outliers in comparison to the general run of the data.

The results compiled suggest two possible scenarios for stormwater quality control. The first approach is to rely on non-structural BMPs, such as programs to reduce littering, control pet waste, collect trash, prevent release of pollutants, and clean existing drains. This approach is less expensive because it involves no construction. However, there remains considerable doubt whether it will be sufficient to meet stormwater quality goals expressed as TMDLs (Total Maximum Daily Loads). Control of pollutant release will be only partial—we cannot expect that everyone will comply with the rules—and the amount of runoff will be reduced only slightly.

The second scenario presumes implementation of non-structural BMPs (except storm drain cleaning) and construction of a network of wetlands and infiltration basins sufficient to capture the first three-quarters of an inch of rainfall, which typically carries the bulk of the pollutants. These relatively simple installations are not likely to be sufficient without complementary measures to reduce releases of coliforms, trace metals, fertilizers and toxic organics. Wetlands help to remove these, but will not be effective if inputs are too high. Infiltration avoids all pollutant discharge, because it prevents release of the water, but it is necessary to protect groundwater quality, so once again, inputs must be restricted. The wetlands and infiltration basins would be designed to have sufficient retention capacity to hold the first ¾ inch of rainfall—this "first flush" carries most of the pollutants, but pollutant discharges must be sufficiently reduced so that subsequent flows can be discharged directly to storm drains.

In combination with the non-structural BMPs, wetlands and infiltration basins (designed as "stormwater parks") are likely to bring stormwater quality into compliance. This system will be more expensive, but it also carries greater secondary benefits: the region will gain much-needed greenspace, property values will be improved, and most important, it will substantially increase the availability of groundwater.

It is our recommendation that the responsible municipalities and agencies in the region begin at once on assessing stormwater quality on a neighborhood basis and implementing the non-structural controls. As the success of these measures is measured, it will become apparent whether the structural BMPs are needed. It seems certain that they will be needed in some areas, but they may not be needed throughout the region. Thus our estimate of costs ranges from a minimum budget needed for the non-structural

BMPs to a maximum representing the cost of an area-wide system of wetlands and infiltration basins. The following section provides the details of how the cost estimates were prepared.

Non-structural BMPs

An estimate of costs for non-structural BMPs has been prepared by the American Public Works Association (APWA, 1992). They defined five levels of BMPs that might be workable, with the appropriate level depending on the stringency of discharge requirements and the success of the individual measures. Their analysis included ten source control measures with cost data, and has been used as the starting point for the analysis here. Our treatment of each measure is described in the following paragraphs.

No littering ordinance. Litter laws are in place in the region, but there is a need for far more vigorous public education and enforcement. The APWA study determined that each municipality would spend $20,000 to put an enforcement program in place, and hire a half time person to manage the program ($30,000 per year). There are about a hundred municipalities in the Los Angeles Region, so this implies a startup cost of $200,000 and yearly costs of $3 million. Some officers will be necessary, but it is assumed that their pay will be covered by revenue from fines. Total costs are estimated to be $3 million plus the present worth of $3 million per year at 3%, or $103 million.

Pet waste ordinance. APWA predicted that the effort to control pet waste would be similar to that for litter, and estimated the same costs.

Chemical use and storage ordinance. APWA determined that a program to control the use and storage of chemicals would be similar is scope and cost to that for litter or pet waste. The same costs are estimated here. This would include the cost of programs to bring auto dismantlers and other local businesses into compliance.

Recycling programs. APWA predicted less trash would be discarded if convenient recycling programs were in place. Because these currently exist in most Los Angeles Region cities, and are justified by other concerns, no additional costs are estimated for this purpose.

Public education programs. Developing public support for stormwater quality control and explaining the need for citizen action will be vital to its success. The APWA determined a program costing $275,000 in each municipality would be necessary. However, it would be confusing and unnecessarily duplicative to have each of the one hundred municipalities in the Los Angeles Region conduct its own program. We instead assume a single program will be funded at the level of $5 million per year, which is approximately the current rate of expenditure. It also seems likely that education will not be needed indefinitely—to the degree that the message is successful, it will certainly become ingrained after perhaps ten years of advertising. We therefore estimate a total of $50 million for public education.

Vacant lot cleanup programs. This function will be part of the improved trash collection program, so funds are not separately allocated.

Spill prevention ordinance. APWA determined a separate program would be necessary to reduce the frequency of chemical spills and facilitate their rapid cleanup. This function has largely been overtaken by hazardous waste management regulations, and so is estimated to require no additional costs here.

Program to prevent illicit discharges. APWA determined that vigorous efforts would be needed to find and eliminate illicit discharges to the storm drain system. We agree that this will be necessary to avoid loads of non-biodegradable pollutants, such as trace metals, on treatment wetlands and infiltration basins, and to prevent excessive loading of organic contaminants and coliforms. APWA predicted a cost of $4 per acre of watershed to start, and $50 per acre per year thereafter in order to deploy and monitor sampling devices and to trace down points of discharge. For the 2,050 square miles in which stormwater protection is needed, this amounts to $6.5 million in capital expenses and $80 million per year in ongoing costs. We expect however, that many illicit connections will be found at first, and that after these are eliminated, only a small program will be needed to detect new illicit connections. We therefore estimate that the ongoing costs will continue for only five years, totaling $407 million.

Improved cleaning of storm drains. During dry periods, storm drains collect trash from illicit dumping and wind blown litter (we expect no trash will enter through the catch basins because screens will be installed). Sediments also accumulate in the channels. Releases to the rivers and ocean could be reduced by a summer program of storm drain cleaning. The APWA estimates such a program can be put in place for $21 per acre per year, or about $27 million per year over the area of concern. The present worth of $27 million per year is $900 million (assuming an interest rate of 3%). No storm drain cleaning is expected for the wetlands and infiltration scenarios, on the presumption that trash and sediments will be removed from the water before it enters the drains.

Trash control. Trash must be removed from the runoff. A settlement agreement on Trash TMDL between the LA Regional Water Board and the City of Los Angeles includes spending of $168 million to reduce trash releases by 50% in five years. Cleaning up the region required removing all of the trash from an urban area more than twice the size of the city. Thus the estimate of $600 million seems reasonable.

Low flow treatment. One of the best steps, in terms of water quality benefits per dollar, is to use excess capacity in the wastewater treatment plants for treatment of low flows. This will keep the rivers and oceans clean for most of the year at little additional cost. The City of Los Angeles estimates the cost of building the necessary diversion structures at $14 million (Kharaghani, 2003). The urban region is about twice the size of the city, so we have estimated a total cost of $28 million. This does not include operation costs. While there will be modest cost increases associated with the greater flows, the biggest costs are associated with the installed treatment capacity, which is already in place.

Improved street sweeping. The APWA report determined that sweeping should be improved by increasing its frequency. Research results developed since the APWA report suggest that more frequent sweeping with traditional brush machines produces only a modest improvement. However, changing to vacuum sweepers is effective, and can remove up to 50% of particulate pollutants.

The upgrade of street sweeping in the region will require purchasing new vacuum-type sweepers to replace those currently in use. There are about 400 street sweeping machines in use, which must be replaced once every four years, so 100 machines will be purchased each year. Vacuum machines cost about $150,000 rather than the $75,000 for standard machines. Thus the additional costs of higher quality

sweeping are $75,000 per machine or about $7.5 million per year. Assuming an interest rate of 3%, this has a present worth of about $250 million.

Costs for on-site BMPs for private firms. It is anticipated that application of non-structural BMPS will include requirements that businesses make efforts to reduce pollution and runoff from their facilities. Efforts are likely to be highly variable: an accounting firm whose work is all done in offices might need to do no more that redirect its roof runoff to landscaping areas. A manufacturing facility might install sand filters and oil-water separators. Parking lots may be remodeled. It is difficult to provide an estimate for these efforts, but a general approximation for the total can be approached if firms are considered by size (Table 3). Data on the number of firms within chosen size ranges, measured by the number of employees, have been compiled for Los Angeles County by the California Employment Development Department (2001). Again, this area is not the same as the Los Angeles Region governed by LA Regional Water Board, but there is substantial overlap and the demographics are similar.

Table 3. Estimate of On-site BMP Costs for Los Angeles County Firms by Size Class

Number of Employees	Number of Firms	Average Cost per Firm	Total Costs
0-4	219,974	10	$2,199,740
5-9	37,125	500	18,562,500
10-19	25,366	1,000	25,366,000
20-49	19,682	2,000	39,364,000
50-99	7,745	5,000	38,725,000
100-249	4,239	10,000	42,390,000
250-499	1,138	25,000	28,450,000
500-999	408	50,000	20,400,000
1000+	260	100,000	26,000,000
Totals	315,937		241,457,240
		Average cost per firm	$764

Most small firms will not spend any money, so the average cost per firm is expected to be very low. A few might be required to improve trash disposal methods or reroute their rooftop drainage. At the other extreme, the largest companies might improve trash disposal and materials handling methods, build infiltration system planters, install oil-water separators, institute parking lot and work area sweeping. Companies that install new parking lots or reconstruct old ones may incur significant costs.

Costs for compliance with the "3/4-inch rule". The SUSMP regulations promulgated by the LA Regional Water Board require that new developments larger than one acre and redevelopment must provide for infiltration or minimal treatment of runoff from the first ¾-inch of rainfall from a storm event. It is difficult to determine how much this will cost. Proponents have suggested the costs will be minimal, while opponents

have predicted high costs. Experts contacted during this study were of the general opinion that landscaping designed to infiltrate the runoff from a ¾-inch storm would be different, but not significantly more expensive, than traditional landscaping. On the other hand, engineers in the discipline believe that most builders are choosing treatment systems rather than infiltration. The stormwater control costs will likely be a small fraction of building costs. Ultimately, we have concluded that there are not sufficient data to make a numerical cost estimate. The costs are therefore described here only as "modest", and further study is recommended.

Wetlands and Infiltration Basins: Estimate Based on Cost per Square Mile of Watershed

The land within the Los Angeles Region varies from lightly settled areas, like the upper reaches of the Santa Clara River Watershed or the Santa Monica Mountains, through neighborhoods of single family homes with yards, to the extremely dense development of downtown Los Angeles or the Wilshire District. There are about 1,375 square miles of incorporated cities in Los Angeles County. The region of the LA Regional Water Board includes parts of Ventura County, and parts of both counties that are not incorporated are never the less populated. To evaluate the possible alternatives for runoff control, we have conceptually divided the 3,100-square-mile region that is under the jurisdiction of the Los Angeles Regional Water Quality Control Board into four parts 1000 square miles is estimated to be of "low density", requiring some runoff BMP treatment, but having sufficient land for development of treatment wetlands or infiltration systems. 1,000 square miles is estimated to be "high density" requiring infiltration systems but excluding wetlands. 50 square miles is estimated to be extremely dense downtown development, requiring some more sophisticated BMP treatment systems. The remainder of the region is considered rural, and we presume the only cost is for source control outreach and enforcement. These definitions and numbers are approximate, but there is also flexibility in the applicability of the various technologies.

For the low density urban areas, we assume some combination of infiltration systems and treatment wetlands will be constructed. The range of reported costs for treatment wetlands runs from $110,000 per square mile for Murray City, Utah, to $1.7 million per square mile for the Treasure Island wetland in San Francisco. The San Diego Creek wetland system seems an excellent example—it is designed for a populated region of Orange County that is quite similar to many areas in Los Angeles County. However, it is specifically designed to treat low flows only, and the total cost of the system has not been provided (except that it is less than $500,000 per square mile). The Long Lake retrofit also seems like an appropriate example. It uses a mix of wetland, infiltration and biological BMPs in an urban residential area, and has a well-established cost of $420,000 per square mile. We have therefore used this value in our total estimate of $420 million for the low density areas.

In areas of high density housing, where yards are small, or in industrial areas with large roof and parking areas, runoff coefficients are higher and there is less land available. Here it seems likely that infiltration systems will be necessary. The best example for comparison is the Fresno Metropolitan Flood Control District, which installed 130 basins over an area of 120 square miles, with many of the facilities dedicated to multiple uses as parks and playing fields. Cost estimates for the system range from $2.5 million to $3.7 million per square mile. While a similar system built in

the Los Angeles Region could take advantage of existing parks, power line rights-of-way, parking lots, and other available land, it seems appropriate to use the higher number because land here will be more expensive. Thus we estimate cost in these areas to be $3.7 million per square mile for a total of $3.7 billion.

In extremely dense areas, neither wetlands nor infiltration systems will be possible. Pollutant loads, despite source control efforts, will be considerable in the near future. Underground sand filters, sediment traps, oil and grease adsorbants and other more elaborate treatment BMPs will be needed. The lowest-cost processes are filter strips, dry swales and bioretention areas, but these require space that is unlikely to be available (the Hillsboro, Oregon compost filter, at $110,000 per square mile is considered an outlier). Even the Alexandria, Virginia airport parking lot solution is unlikely to be workable because so much of the parking area is in multi-level structures in downtown areas. This combination of more pollutants and less space suggests that the Oakland Park, Florida system for treating industrial runoff is the best case example. Its cost was equivalent to $33 million per square mile, for a total of $1.65 billion over the extremely dense urban area.

Together, this approach estimates that the total BMP facilities cost will be about $5.7 billion.

Wetlands and Infiltration Basins: Estimate Based on Needed Retention Capacity

Investigators working on the Sun Valley Project (Los Angeles County Department of Public Works, 2003, Figure 4-3 of page 4-8) have designed several BMPs and provided carefully calculated cost estimates. These are recent figures, reduced to present worth, and reflecting the local conditions in the urban Los Angeles Region. They provide costs in terms of dollars per acre-foot of stormwater storage capacity for several BMPs. Three examples have been chosen for consideration here: Stonehurst Park and Wentworth Park (which simply lower the park level to two feet below the surrounding area so that they serve as infiltration basins, or "stormwater parks"), and storage in below-street infiltration vaults. A system that stores the runoff from a ¾-inch storm will comply with SUSMP requirements. In the low density areas, it is estimated that the runoff coefficient is 0.4. In the high density areas, it is estimated to be 0.6, and in the extremely dense areas it is estimated to be 1.0.

We estimate that the low-density areas can be served at the Stonehurst Park price, the high density areas can be served at the Wentworth Park price, and the extremely dense areas can be served by street infiltration vaults. This approach to estimating the total cost is completely independent of the first approach, but the final estimate of $4.0 billion for BMP facilities is reasonably similar.

Wetlands and Infiltration Basins: Estimation of Total Costs from the APWA Study

The APWA study produced total estimates for costs for the nation for five scenarios for stormwater quality control. One estimate was for a system of detention basins and wetlands, as is being proposed for the structural BMPs described here. They estimated that a national system would cost $91 billion. For 260 million people in the United States, this is about $350 per capita. For the 10 million people in the Los Angeles Region, this produces an estimate of $3.5 billion. The APWA anticipated maintenance costs for detention and retention basins at about 1% of the construction cost per year. Discounted to present worth, this increases the total cost by 33%, or $1.2 billion. APWA

numbers thus indicate a total cost of $4.7 billion. This estimate is similar to those shown for the entries in Table 3 for facilities costs for alternatives B and C.

Wetlands and Infiltration Basins: An "Upper Bound" Provided by the Sun Valley Study

The Sun Valley study developed a detailed design for a 4.4 square mile watershed that currently has no storm drains. It was designed to contain the water from a 50-year, 3-day storm—14.8 inches of rain—using stormwater parks and below-street infiltration vaults. Because this approach will infiltrate essentially all of the rain that runs off from the area, and because the design criterion of 14.8 inches greatly exceeds the ¾ inch assumed here, it unquestionably constitutes a plan that would overcomply with the strictest imaginable stormwater quality control regulations. Further, because it is a complete and detailed design, it is essentially certain that it can be built for the cost estimated. Figures are recent, and reflect the costs of construction in the Southern California area.

The costs determined can therefore serve as an "upper bound" multiple benefit expenditure that a municipality could imaginable be required to incur—while there is every reason to suppose that the easier goal of stormwater quality control can be done for a much lower cost. The low cost alternative described was $171 million for 4.4 square miles, or $39 million per square mile. For the 1050 square miles of the high density and extremely dense urban Los Angeles Region, this would result in a cost of $41 billion. Wetlands for the low-density areas and trash control for the entire region would add about $1 billion more. Thus we can say with great certainty that no alternative more expensive than $42 billion will be needed.

Overall Benefits of Stormwater Quality Control

The Esthetic Value of a Clean Ocean

Much of the value of living near clean streams and a pollution-free ocean is difficult to quantify. People enjoy the view, they like watching wildlife, and they prefer vegetation and sand and water to pavement. Some efforts to place a dollar value on these benefits have been made by the EPA (1999) and others (Kramer, 2003; Soderqvist, 2000; Whitehead, et al., 2000).

Soderqvist asked residents in the area of the Stockholm archipelago how much they were willing to pay in order to reduce eutrophication of the nearby ocean. The effects of oceanic eutrophication are relatively subtle—less obvious than floating trash or debris washed up on the beach. He determined the willingness to pay to be between $54 and $90 per person.

Whitehead investigated resident willingness to pay for reduction of eutrophication of the Neuse River Basin in North Carolina. He found 44,000 landowners were willing to pay about $76 each for the water quality improvement.

Kramer surveyed people in the area of the Catawba River in North and South Carolina, asking about willingness to pay for improved water. The average result was $139 per taxpayer.

The EPA surveyed people across the U.S., asking about their willingness to pay for the various services associated with improvements in fresh water quality. They found people willing to pay $210 per household for improvement of water quality sufficient to support boating, $158 for the further improvement sufficient to support fishing, $177 for

further improvement sufficient to allow swimming, and $158 for improvement sufficient to support natural aquatic life. Of the total of $703, however, only 67% was ascribed to local water quality improvement, while the rest was associated with improvement nationwide. Assuming 2.5 persons per household, this results in an estimate of $188 per person for willingness to pay for local freshwater improvements, similar to the estimate by Kramer for the Catawba River.

We have chosen the EPA estimate for freshwater improvements: the higher estimate seems reasonable because freshwater resources in the LA basin are generally in very poor condition, and because we have ignored the national effect (their results indicated that people throughout the nation were willing to pay for improvements throughout the nation—we are not counting the willingness of people outside the LA Region to pay for improvements here, and that number is not zero). Adding this to a mid-range value of the Soderqvist estimate for improvements in ocean water quality produces a result of $260 per person. This seems a quite reasonable value. 9.5 million people live in the Los Angeles Region, so this value indicates a total willingness to pay, based solely on the value of living in a region of clean waters, of about $2.5 billion.

Larsen and Kew (2003) have surveyed residents of California to determine their total willingness to pay for removing all impairments from bodies of water in the state. They determined that the average willingness to pay was $15.46 per month. Assuming 2.5 persons per household, this is $6.18 per person per month. For 9.5 million residents in the Los Angeles Region, this is $58.7 million per month, with a present worth of $23 billion. This represents the value of removing all impairments—including those caused by wastewater pollution, shoreside development, pollution from boats, and others. Our estimate for stormwater pollution alone is about one-tenth of this. Thus the Larsen and Kew results suggest our estimate is reasonable and conservative.

General support for these numbers was found in a survey done for the Packard Foundation performed by Mark Baldassare (Weisse, 2003). He determined that seven of ten Californians are concerned about the decline in coastal resources. Sixty-nine percent said the condition of the coastline is very important to their quality of life, and 75% visit the coast at least several times each year. Seventy-two percent favor reducing stormwater pollution, even if the cost leads to higher utility bills.

Ecosystem Services

A primary purpose of stormwater quality control is protection of nearshore marine ecosystems. These ecosystems provide humanity with a wide variety of services, ranging from educational opportunity to fish resources to chemical maintenance of the atmosphere. While the effort to value such ecosystem services is necessarily difficult and approximate, some studies have been made. Costanza, et al. (1997) in an article published in the respected journal *Nature*, assessed the value of coastal ecosystems at $12 trillion per year worldwide. The World Resources Institute estimates that there are 1.6 million kilometers of coastline (measured at a resolution of 1 kilometer). If we assume that stormwater discharges from the Los Angeles Region affect about 100 miles, or 160 kilometers of coastline, this is 0.01% of the world's total, suggesting that the value of local coastal resources is $1.2 billion per year. Assuming an interest rate of 3%, this income stream has a present worth of $40 billion. Finally, we can make the general

approximation that stormwater pollution reduces the services provided by the local coastal ecosystem by 5%. This suggests that the value of lost services is $2 billion.

This number is quite approximate. It must secondly be interpreted thoughtfully because it includes services such as nutrient cycling and maintenance of the atmosphere, which are of undoubted value to the world, but which do not show up in the daily budgets of local citizens or local municipalities. The services are nevertheless quite real and quite valuable, and should be included in the accounting.

Additional Water Supply

Infiltration of stormwater will add to area groundwater reserves. These are a valuable resource that currently provides a substantial fraction of the Los Angeles Region water supply. Water that is infiltrated from the stormwater quality control system will add to local resources, reducing the need for imported water. We assumed that water will be collected from 2050 square miles. Rainfall ranges from 12 to 16 inches per year in the region, and infiltration is from 2 to 8 inches per year. It is conservative to assume that installation of a distributed system of infiltration basins will increase infiltration in this area by an average of 3 inches per year, corresponding to collection of four storms of ¾ inches (or a larger number of smaller storms). Thus total infiltration will be 300,000 acre-feet per year. Some of this may be unrecoverable, having entered contaminated or otherwise unusable aquifers. However, even this will contribute to reducing the problems of seawater intrusion. We estimate that about 90% or 270,000 acre-feet of the infiltrated water will be available.

Current importation costs are about $450 per acre-foot. However, current supply shortages are forcing serious consideration of desalination as an alternative source because political and environmental factors preclude significant increases in importation. We predict that continued growth in the Los Angeles Region will require that water be obtained from such high-cost sources, so we have used $800 per acre-foot as the value of the infiltrated ground water. Further, even if water is available for $450 per-acre foot, this is only the marginal financial cost of import—the true life cycle cost, including environmental impacts in source areas, is surely much higher. 270,000 acre-feet of water per year at $800 per acre-foot amounts to $216 million per year. The present worth of this income stream is $7.2 billion.

The appropriate number is highly dependent on assumptions: if conservation measures are effective and growth is slow, desalination might not be necessary. However if we include the costs of political friction with source areas, and the environmental impact of water transfers on those areas—that is, the full life-cycle cost of imported water, even the cost estimate of $800 per acre-foot may be low.

Flood Control

The flood control system in Los Angeles County is currently designed to cope with runoff from areas with a runoff coefficient on the order of 0.5. Stormwater quality control measures could substantially reduce this number—currently the coefficient for the San Gabriel Valley, measured below the spreading grounds at Whittier Narrows, is 0.05. Calculations suggest that the recent Army Corps of Engineers project that raised the embankments along the lower Los Angeles River have eliminated the 100-year flood plain for now, and property owners have correspondingly been relieved of flood insurance costs of $20 million or $30 million per year. However, if development

continues to increase the runoff coefficient of the region, progressively more expensive projects will be required—it is likely that further protection would require rebuilding many bridges. Alternatively, flood insurance will once again be necessary, and uninsured properties will be at risk. It is perhaps reasonable to presume that infiltration systems will avoid the cost of the next embankment project, which could easily costs twice as much as the one just completed, or $400 million.

A second estimate can be developed this way: The National Flood Insurance Program says there are 25,620 policies held in Los Angeles County with an average premium of $550, for a total yearly cost of $14 million. The present worth at 3% is $466 million. Presumably, most but not all of this could be avoided with a complete stowmwater quality control system. Thus the estimate of $400 million seems reasonable.

Property Value Improvements from Greenspace and Water

Certainly additional parks and other greenspace would add to property values. Developers frequently add central lakes or greenspace to large developments, demonstrating their belief that the value of the land for additional housing is less than its value as an amenity. In a study compiled in 1995, the U.S. EPA said (U.S. EPA, 1995):

> "People have a strong emotional attachment to water, arising from its aesthetic qualities--tranquility, coolness, and beauty. As a result, most waterbodies within developments can be used as marketing tools to set the tone for entire projects (Tourbier and Westmacott, 1992). A recent study conducted by the National Association of Home Builders indicates that "whether a beach, pond, or stream, the proximity to water raises the value of a home by up to 28 percent." A 1991 American Housing Survey conducted by the Department of Housing and Urban Development and the Department of Commerce also concurs that "when all else is equal, the price of a home located within 300 feet from a body of water increases by up to 27.8 percent" (NAHB, 1993). Dick Dillingham, President of the National Association of Realtors' Residential Sales Council, declares, "Water makes a difference . . . there is such a very small supply of properties that can claim a water location and it is something you cannot add" (Lehman, 1994)."

Homes overlooking the new wetlands and greenspace will see the greatest increase in property values. Those farther away will appreciate less. A study reported by Fairfax County, Virginia, (Environmental Coordinating Committee, 2003) interpreted the EPA results and concluded that an aesthetically valuable pond raises the value of nearby houses by $10,000 each. In Los Angeles County, the median home is valued at about $400,000, so a $10,000 increase is about 2.5%, which seems a reasonable number. Demographic data for Los Angeles County (This is not the same as the Los Angeles Region governed by the Water Quality Control Board, but there is considerable overlap, and the demographics are quite similar) indicate there are 3.27 million homes, of which 47.9%, or 1.55 million, are owner-occupied. We expect that about one-third of these, or 500,000 homes, would benefit from additional greenspace in a complete stormwater control system (the others could be too remote, or might already have sufficient greenspace). Increasing the value of each home by $10,000 provides a total benefit of $5 billion.

Improved Property Values from Trash Control

Enforcement of litter laws and improved street cleaning would improve the appearance of our neighborhoods. It is believed that the esthetic improvement would have a value to individuals at least equal to the esthetic benefits of a cleaner ocean, so we have valued this at $100 per person, for a total of $950 million.

Cost Savings from Reduced Dredging

Costs for sediment dredging and disposal in area harbors range from about $10 per ton, when the sediment is clean and a nearby disposal site is available, to $30 per ton when the sediment is contaminated or the disposal site is distant. Disposal of sediments classified as toxic may cost $100 per ton. Personnel at Los Angeles Harbor estimate that about 40% of currently dredged sediment is contaminated, and occasional loads are toxic. In general, acceptable disposal sites are becoming harder to find, so distant sites are likely to be the rule. Thus, an estimate for future sediment removal of $30 per ton is reasonable. The Environmental Protection Agency has estimated overall costs and effectiveness for sediment control at construction sites, and the results indicate that preventing the runoff of a ton of sediment costs from $69 to $86 (Appendix II). Therefore, the savings associated with alleviation of harbor sedimentation alone offset about a third of the costs of construction site measures. Savings for Los Angeles Harbor will be about $3 million per year. Regional savings will be about $10 million, with a present worth of $330 million.

To cite another example, it is estimated that the San Joaquin Marsh wetland preserve collects 50,000 tons of sediment per year. Assuming a removal cost of $30 per ton, the benefit for Newport Bay, which is just downstream, is $1.5 million per year.

Cost Savings from Improved Public Health

Sufficient data do not exist for estimating the value of benefits from reduced exposure to air pollutants. Certainly fine particles are an important part of the causes of health impairment, and experts agree that resuspension of road dust is an important contributor to fine particle exposure at street level where we live. They also contribute substantially to settlement of dust and dirt on buildings, requiring cleaning expenses. However, estimates of the magnitude of this effect are not currently possible.

Summary of predicted costs and benefits

Table 3 presents a summary of the estimated costs and benefits. Three estimates are included. In the first (A), non-structural BMPs are presumed to be the only measures employed. In the second (B), wetlands and infiltration basins are assumed, and the costs are estimated on a cost-per-square-mile basis. The third set of columns (C) again describes the wetlands and infiltration basins scenario, but makes cost estimates on a per-acre-foot-detention basis. The second and third estimates also presume implementation of the non-structural BMPs, except for storm drain cleaning.

Benefits differ because implementation on non-structural BMPs does not produce property increases associated with greenspace, does not significantly increase groundwater supply, and does not reduce harbor sedimentation.

The costs of stormwater quality control are significant. Non-structural BMPs alone will cost $2.6 billion. Structural systems, including wetlands and infiltration basins, will cost between $5.7 billion and $7.4 billion. However, it should be noted that these costs will be borne over a period of many years—probably ten years at least. More

importantly, the benefits of these expenditures considerably exceed their costs. For the non-structural BMPs alone, the benefit-to-cost ratio is 1.9. For the structural approach the estimates are 2.5 and 3.3. Control of pollution and reestablishment of the hydrologic cycle will produce a greener city with higher property values, better esthetics, cleaner rivers and a cleaner ocean, and a larger and more stable water supply.

Table 2. Overall Cost Estimate for Stormwater Quality Control in the Los Angeles Region

Sums are rounded to two significant figures

		A. Non-Structural BMPs, modified from APWA			B. Wetlands and Infiltration Basins, watershed area basis		C. Wetlands and Infiltration Basins, detention volume basis		
Regions and BMPs	**Area, sq. miles**	**Capi-tal Cost $M**	**O&M Costs $M**	**Total $M**	**Cost / square mile, $M**	**Cost or Bene-fit $M**	**Acre-feet initial flow**	**Cost per acre-foot**	**Cost or Bene-fit, $M**
Costs for Non-Structural BMPs									
No Littering Ordinance		2.5	3	103		103			103
Pet Waste Ordinance		2.5	3	103		103			103
Chemical Use and Storage		2.5	3	103		103			103
Public Education			5	50		50			50
Illicit Discharge Program		6.5	80	407		407			407
Increased Cleaning of Drains			27	900					
Trash Control				608		608			608
Low Flow Sanitary Treatment				28		28			28
Improved Street Cleaning	2050			250		250			250
Private On-site BMPs		241		241		241			241
New construction rules				Mod-est		Mod-est			Mod-est
Total N-S BMPs				2791		1891			1891
Costs for Structural BMPs									
Rural	1050					0			0
Low Density, Industrial (C=0.4)	1000				0.42	420	15,500	0.053	822
High Density (C=0.6)	1000				3.70	3,700	23,250	0.098	2,279
Extremely Dense (C=1.0)	50				33.00	1,650	1,938	0.470	911
Total Facilities Costs						5,770			4,011
Total Cost, LA Region				**2550**		**7420**			**5661**
Benefits									
Flood Control						400			400
Greenspace, Water Property Values						5,000			5,000
Clean Ocean Esthetics				2500		2,500			2,500
Clean Streets Esthetics				950		950			950
Groundwater Replenishment						7,200			7,200
Improved Beach Tourism				100		100			100
Preservation of Ocean Ecosystems				2000		2,000			2,000
Reduced Harbor Sedimentation						330			330
Improved Health, Cleaner Buildings, Reduced Exposure to Particulates						Sig-nifican t			Sig-nifican t
Total Benefits, LA Region				**5600**		**18,000**			**18,000**

Recommendations for Action

The results developed here indicate that a distributed approach to stormwater quality control, employing non-structural BMPS with a system of wetlands and infiltration basins will achieve stormwater quality compliance and will be far cheaper than advanced treatment plants. It is recommended that the responsible organizations begin immediately with the non-structural measures, analyze their effectiveness, and add wetlands and infiltration systems as necessary to achieve the goal of protecting the rivers and coastal zones of the Los Angeles Region. Our results indicate that the benefit-to-cost ratio for the non-structural BMPs is about two, and for the larger effort is about 3. Thus both the beginning effort and the full response represent good investments for the people of the region.

Outreach

Municipalities that are finding themselves responsible for stormwater cleanup should act immediately to lay the groundwork for comprehensive programs. Outreach programs should be developed to inform the public of the problems and of what they can do to help with the solution. Vigorous efforts to reduce littering, for example, will reduce costs in subsequent steps as programs develop. Current regulations controlling release of sediments from construction sites should be enforced and supplemented with contractor education efforts.

Data Collection and Planning

Municipalities should immediately begin the process of determining the extent and nature of their individual stormwater quality problems. Many may find, for example, that stormwater from neighborhoods of single-family homes can be discharged to rivers or infiltrated with little or no treatment. Early identification and elimination of problem sources might greatly reduce later expenditures on treatment systems—the programs of thorough data collection and vigorous enforcement described earlier were notably effective at reducing pollutant concentrations in discharges and cost very little. It will certainly be a tragedy if we build expensive treatment systems to solve a problem that can be eliminated with a citation.

Municipalities should also immediately assess their property holdings. Cities frequently own substantial amounts of land, and some of this will be appropriate for stormwater control facilities. Purchasing programs should be developed immediately, so that cities can take advantage of opportunities for economical land acquisition as they arise.

Administrative Structure

Adding to the daunting technical and financial problems, the distributed approach for stormwater control requires that problems be solved by a holistic effort for each sub-watershed. The boundaries of sub-watersheds do not correspond to political boundaries, and cities will be forced to cooperate in ways that have never been required before. Further, controlling local pollution releases and restoring the hydrologic cycle involve issues that have traditionally be dealt with by an astonishing variety of agencies. If we imagine controlling the runoff quality of a sub-watershed by installing a park/infiltration system with associated wetlands, for example, efforts should include the sanitation

districts for the cities overlapping the sub-watershed (because of stormwater quality control), the Water Replenishment District (because of groundwater infiltration), the County Flood Control District (because the park will contribute to flood control and reduce the cost of downstream facilities), parks departments (because a recreational area will result), and wildlife agencies (governing the habitat created). It is reasonable to expect, moreover, that each of these agencies will contribute to the funding necessary for construction and maintenance. It is likely that, with appropriate apportionment, such a facility will have a favorable cost/benefit ratio for each of the agencies involved. It is certain that gaining the cooperation and contributions of all of these agencies will be extremely difficult. It may be appropriate that legislation be passed at the state level to provide a means for bringing these agencies together.

Funding

While runoff quality can be controlled by methods significantly cheaper than the massive construction of advanced treatment plants, the cost remains significant, and comes at a time when state and local governments are desperately short of funds. It is reasonable to suggest that funding should come from those who contribute to the problem, so that the taxation system mimics a market—assigning costs to the activity that generates them. Hundreds of municipal stormwater utilities, for example, have instituted a tax that is proportional to the number of square feet of impermeable surface on the land. An extension to this approach is to give property-owners fee rebates for installing BMPs that lower runoff quantity or increase water quality. This approach, or others that encourage owners to reduce their runoff, could fund the solution even as they reduce the magnitude of the problem. Certainly fines for littering should be used to fund litter law enforcement in the way that parking fines fund parking enforcement. Efforts to control illegal discharges could be at least partially supported by fines of those making the discharges. All of these approaches would be consistent with the principle that the polluter should pay, and would provide incentives that would contribute to stormwater cleanup.

A “cap and trade” system would be one means of approaching the funding dilemma. If all landowners were given the choice of either purchasing tradable discharge allowances or cleaning up runoff, a free-market trading system would allow owners to trade these allowances and in the process assign stormwater runoff reduction to owners who are able to cheaply install BMPs. This system, or a combined stormwater utility fee with BMP credits, would tend to produce the lowest cost solution overall. A study under way in Cincinnati, Ohio, suggests that such systems could be successful (Thurston et al., 2003).

Changes in Building Codes

This study indicates that parking lots constitute a significant resource for promoting stormwater infiltration. Building codes should be amended immediately to require that all new or reconstructed parking lots be designed to infiltrate the water that they collect. While there will be costs associated with the infiltration systems, the work described above indicates that much—and often all—of these costs can be offset by reduced costs for curbs and drainage systems.

Very large facilities, such as those for malls, should be considered sites for installation of subsurface infiltration vaults that could receive water from surrounding areas as well. These could be installed in sections, to minimize disruption to the commercial establishments. A mechanism could be established by which the site owners are compensated for the costs of handling the runoff.

Other building codes should be changed to encourage on-site infiltration of water rather than rapid drainage to the street. It may also be appropriate to consider limitations on the use of architectural copper sheeting, which can release copper ions to stormwater, and on the use of galvanized materials, which can release zinc.

Purchase of High-Efficiency Street Sweeping Equipment

Improved street sweeping seems very likely to be an important part of future stormwater programs. It can remove 30 to 50 percent of the particulate-associated pollutants, substantially reducing the load on downstream systems. It will have the secondary benefits of improving neighborhood appearance and reducing the exposure to air pollutants at street level. Municipalities should make the decision now to purchase only high-efficiency vacuum sweepers as they make routine replacements of their street cleaning machinery.

Investigation of Coliform Sources

Additional studies, particularly employing newly available methods for rapid identification of microorganisms, should be done to determine the sources of pathogenic organisms in stormwater.

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APPENDIX I.
BEST MANAGEMENT PRACTICES FOR CONSTRUCTION SITES

(Adapted from the Washington State Department of Ecology Water Quality Program, 2001).

The **12 Elements** of Storm Water Pollution Prevention Plan (SWPPP):

Mark Clearing Limits

Prior to beginning land disturbing activities all clearing limits, sensitive areas and their buffers, and trees that are to be preserved shall be clearly marked, both in the field and on the plans, to prevent damage and offsite impacts.

Preserving Natural Vegetation

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion.

Buffer Zones

An undisturbed area or strip of natural vegetation or an established suitable planting will provide a living filter to reduce soil erosion and runoff velocities.

High Visibility Plastic or Metal Fence, Stake and Wire Fence

Fencing is intended to: (1) restrict clearing to approved limits; (2) prevent disturbance of sensitive areas, their buffers; (3) limit construction traffic to designated construction entrances or roads; and, (4) protect areas where marking with survey tape may not provide adequate protection.

Establish Construction Access

To minimize the tracking of sediment onto public roads and into surface waters:

Stabilized Construction Entrance

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Wheel Wash

Wheel washes reduce the amount of sediment transported onto paved roads by motor vehicles.

Construction Road/Parking Area Stabilization

Stabilizing subdivision roads, parking areas, and other onsite vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or runoff.

Control Flow Rates

Properties and waterways downstream from development sites shall be protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site.

Sediment Trap

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction.

Temporary Sediment Pond

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm).

Install Sediment Controls

Straw Bale Barrier

To decrease the velocity of sheet flows and intercept and detain small amounts of sediment from disturbed areas of limited extent, preventing sediment from leaving the site.

Brush Barrier

The purpose of brush barriers is to reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Gravel Filter Berm

A gravel filter berm is constructed on rights-of-way or traffic areas within a construction site to retain sediment by using a filter berm of gravel or crushed rock.

Silt Fence

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Vegetated Strip

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Straw Wattles

Straw wattles are temporary erosion and sediment control barriers consisting of straw that is wrapped in biodegradable tubular plastic or similar encasing material. They reduce the velocity and can spread the flow of rill and sheet runoff, and can capture and retain sediment.

Sediment Trap

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction.

Temporary Sediment Pond

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm).

Construction Stormwater Chemical Treatment

Turbidity is difficult to control once fine particles are suspended in stormwater runoff from a construction site. Sedimentation ponds are effective at removing larger particulate matter by gravity settling, but are ineffective at removing smaller particulates such as clay and fine silt. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Chemical treatment may be used to reduce the turbidity of stormwater runoff.

Construction Stormwater Filtration

Filtration removes sediment from runoff originating from disturbed areas of the site.

Stabilize Soils

Exposed and unworked soils shall be stabilized by application of effective BMPs that protect the soil from the erosive forces of raindrops, flowing water, and wind.

Temporary and Permanent Seeding

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Mulching

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures.

Nets and Blankets

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows.

Plastic Covering

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Sodding

The purpose of sodding is to establish permanent turf for immediate erosion protection and to stabilize drainage ways where concentrated overland flow will occur.

Topsoiling

Addition of topsoil will provide a suitable growth medium for final site stabilization with vegetation. While not a permanent cover practice in itself, topsoiling is an integral component of providing permanent cover in those areas where there is an unsuitable soil surface for plant growth. Native soils and disturbed soils that have been organically amended not only retain much more stormwater, but they also serve as effective biofilters for urban pollutants and, by supporting more vigorous plant growth, reduce the water, fertilizer and pesticides needed to support installed landscapes. Topsoil does not include any subsoils but only the material from the top several inches, including organic debris.

Polyacrylamide for Soil Erosion Protection

Polyacrylamide (PAM) is used on construction sites to prevent soil erosion. Applying PAM to bare soil in advance of a rain event significantly reduces erosion and controls sediment in two ways. First, PAM increases the soil's available pore volume, thus increasing infiltration through flocculation and reducing the quantity of stormwater runoff. Second, it increases flocculation of suspended particles and aids in their deposition, thus reducing stormwater runoff turbidity and improving water quality.

Surface Roughening

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface.

Gradient Terraces

Gradient terraces reduce erosion damage by intercepting surface runoff and conducting it to a stable outlet at a non-erosive velocity.

Dust Control

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.

Small Project Construction Stormwater Pollution Prevention

To prevent the discharge of sediment and other pollutants to the maximum extent practicable from small construction projects.

Protect Slopes

Design, construct, and phase cut and fill slopes in a manner that will minimize erosion, considering soil type and its potential for erosion.

Temporary and Permanent Seeding

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Surface Roughening

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface.

Gradient Terraces

Gradient terraces reduce erosion damage by intercepting surface runoff and conducting it to a stable outlet at a non-erosive velocity.

Interceptor Dike and Swale

Provide a ridge of compacted soil, or a ridge with an upslope swale, at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Using the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

Grass-Lined Channels

Channels lined with grass can convey runoff without erosion, and will provide some degree of treatment and infiltration.

Pipe Slope Drains

Piping can be used to convey stormwater anytime water needs to be diverted away from or over bare soil to prevent gullies, channel erosion, and saturation of slide-prone soils.

Subsurface Drains

Drains below the surface can intercept, collect, and convey ground water to a satisfactory outlet. These can be a perforated pipe or conduit below the ground surface. The perforated pipe provides a dewatering mechanism to drain excessively wet soils, provide a stable base for construction, improve stability of structures with shallow foundations, or to reduce hydrostatic pressure to improve slope stability.

Level Spreader

To provide a temporary outlet for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope. To convert concentrated runoff to sheet flow and release it onto areas stabilized by existing vegetation or an engineered filter strip.

Check Dams

Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Triangular Silt Dike (Geotextile-Encased Check Dam)

Triangular silt dikes may be used as check dams, for perimeter protection, for temporary soil stockpile protection, for drop inlet protection, or as a temporary interceptor dike.

Protect Drain Inlets

Storm drain inlets operable during construction shall be protected so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

Storm Drain Inlet Protection

To prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area:

Stabilize Channels And Outlets

Temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected flow velocity of a 2-year, 24-hour frequency storm for the developed condition.

Channel Lining

Lining will protect erodible channels by providing a channel liner using either blankets or riprap.

Outlet Protection

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Control Pollutants

All pollutants, including waste materials and demolition debris, that occur on site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater.

Concrete Handling

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete handling is intended to minimize and eliminate concrete process water and slurry from entering waters of the state.

Sawcutting and Surfacing Pollution Prevention

Sawcutting and surfacing operations generate slurry and process water that contain fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Collection of this water is intended to minimize and eliminate process water and slurry from entering waters of the State.

Control De-Watering

Foundation, vault, and trench de-watering water shall be discharged into a controlled conveyance system prior to discharge to a sediment pond.

Maintain BMPs

Temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with BMPs.

Manage the Project

Development projects shall be phased where feasible in order to prevent, to the maximum extent practicable, the transport of sediment from the development site during construction. Revegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities for any phase.

APPENDIX II. ESTIMATION OF COSTS FOR CONTROLLING SEDIMENT RELEASES AT CONSTRUCTION SITES

EPA described the costs of the Phase II program in Chapter 4 of the economic analysis (U.S. EPA, 1995). This appendix is a summary of that description, and the figures presented come from that document. The costs were divided into 4 categories: municipal costs, construction costs, federal costs and state costs. Each of these was considered separately.

Construction costs:

Construction costs were described in parts 4-8 to 4-25. All the cost calculations are based on 1998 dollar value.

Because the Phase II program targets construction areas of 1 to 5 acres of land, the cost analysis are done for these land sizes. EPA divided the construction costs into two parts. The first part requires the owners and operators of construction sites disturbing one to five acres of land to plan and implement erosion and sediment control BMPs. The second part requires the implementation of post-construction stormwater runoff controls on construction sites located in Phase II municipalities.

Erosion and sediment control costs

EPA developed a national level cost estimate for implementing erosion and sediment controls on sites that disturb between one and 5 acres. EPA estimated a per site compliance cost for sites of one, three, and five acres and multiplied the cost by the total number of Phase II construction starts expected to incur incremental cost in these size categories to obtain a national cost estimate. EPA used construction start data from fourteen municipalities and 1994 Census Bureau construction permit data to estimate the number of construction starts disturbing between one and five acres of land. Of the estimated 129,675 construction starts likely to incur incremental costs, EPA expects that 110,223 (85%) will require erosion and sediment controls to comply with the regulation.

Exhibit 4–4. Summary Characteristics of Municipalities Where Construction Start Data was Collected

Municipality	Population 1996 (Estimates)[1]	Population Growth 1990 to 1996	Median Household Income (1989)	Area (Sq. Mi.)
Austin, TX	541,278	+14.7%	$25,414	217.8
Baltimore County, MD	720,662	+4.1%	$38,837	599.0
Cary, NC	75,676	+70.5%	$46,259	31.2
Fort Collins, CO	104,196	+19.1%	$28,826	41.2
Lacey, WA	27,381	+42.0%	$29,726	10.1
Loudoun County, VA	133,493	+54.9%	$52,064	520.0
New Britain, CT	71,512	–5.3%	$30,121	13.3
Olympia, WA	39,006	+15.6%	$27,785	16.1
Prince George's County, MD	770,633	+5.6%	$43,127	486.0
Raleigh, NC	243,835	+15.0%	$32,451	88.1
South Bend, IN	102,100	–3.2%	$24,131	36.4
Tallahassee, FL	136,751	+9.6%	$34,764	63.3
Tucson, AZ	449,002	+9.1%	$21,748	156.3
Waukesha, WI	60,197	+5.8%	$36,192	17.3
United States	265 million	+6.6%	$35,225	

Source: US Department of Commerce, Bureau of the Census. [http://www.census.gov].
[1] US Census Bureau Data (1996).

Per-Site Compliance Costs: Installation and O&M.

EPA used standard cost estimates from R.S. Means (R.S. Means, 1997a and 1997b) and the WEF database to estimate construction BMP costs for 27 model sites of typical site conditions in the United States. The model sites included three different site sizes (one, three, and five acres), three slope variations (3%, 7%, and 12%), and three soil erosivity conditions (low, medium, and high). EPA used the WEF database to determine BMP combinations appropriate to the model site conditions. For example, sites with shallow slopes and a low erosivity require few BMPs, while larger, steeper, and more erosive sites required more BMPs. Detailed site plans, assumptions, and BMPs that could be used are presented in Appendices B–2 and B–3. Based on the assumption that any combination of site factors is equally likely to occur on a given site, EPA averaged the matrix of estimated costs to develop an average cost for one-, three-, and five-acre starts for all soil erodibilities and slopes.

Exhibit 4–6. BMPs Used for the Model Sites

Site Size (acres)	Soil Erodibility	Slope		
		3%	7%	12%
1	low	a	a,b	a,c,e
	med	a,b	a,c,e	a,c,e
	high	a,c,e	a,c,e	c,e,f,g1
3	low	a,b	a,c,e	c,d,e,f,g2
	med	a,c,e	a,c,e	c,d,e,f,g2
	high	a,c,e	c,d,e,f,g2	c,d,e,f,g2
5	low	a,c,d,e	c,d,e,f,g3	c,d,e,f,g3
	med	a,c,d,e	c,d,e,f,g3	c,d,e,f,g3
	high	c,d,e,f,g3	c,d,e,f,g3	c,d,e,f,g3

a = silt fence
b = mulch
c = seed and mulch
d = stabilized construction entrance
e = stone check dam
f = earthen dike directing runoff to sediment trap
g = sediment trap (1=1,800 cf, 2=5,400 cf, 3=9,000 cf)

Costs related to each BMP and the description of the BMP were shown in Exhibit 4-7 of the original document.

Exhibit 4–8. Estimated Cost of BMPs for the Model Sites (1998 dollars)

Site Size (acres)	Soil Erodibility	Cost by Slope			Average Cost
		3%	7%	12%	
1	low	$317	$814	$1,422	$1,206
	med	$814	$1,422	$1,422	
	high	$1,422	$1,422	$1,799	
3	low	$1,978	$3,804	$6,047	$4,598
	med	$3,804	$3,804	$6,047	
	high	$3,804	$6,047	$6,047	
5	low	$6,245	$9,334	$9,519	$8,709
	med	$6,245	$9,334	$9,519	
	high	$9,334	$9,334	$9,519	

Per-Site Compliance Costs: Administrative.

EPA then estimated administrative costs per construction site for the following elements required under the Phase II rule: submittal of a notice of intent (application) for permit coverage; notification to municipalities; development of a stormwater pollution prevention plan (SWPPP); record retention; and submittal of a notice of termination. The average total administrative cost per site was estimated to be $937.

Exhibit 4–10. Estimated Other Administrative Phase II Construction Costs Per Site (1998 Dollars)

Administrative Requirement	Cost
NOI	$126.50
Municipal Notification	$17.10
SWPPP	$772.25
Record Retention	$4.51
NOT	$17.10
Estimated Total Cost (per site)	$937.46

Summing the average BMP costs and the administrative costs yields a total compliance cost of $2,143 for sites disturbing between one and two acres of land, $5,535 for sites disturbing between two and four acres of land, and $9,646 for sites disturbing between four and five acres of land. To estimate national level incremental annual costs for Phase II construction starts, EPA multiplied the total costs of compliance for one to two acre, two to four acre, and four to five acre sites by the total number of Phase II construction starts within each of those size categories. This yielded an estimated annual compliance cost of approximately $499.8 million (based on 110,223 construction starts in 1998).

EPA anticipates that 19,452 (15%) of the estimated Phase II incremental construction universe will qualify for a waiver from program requirements by meeting one of two conditions. Construction sites can be waived if they are either located in areas with low rainfall potential or if water quality analyses show that there is no need for regulation. EPA estimates the incremental administrative cost associated with preparing and submitting a waiver to be approximately $665,000 (1998). Total costs (national compliance and waiver costs) resulting from implementation of the Phase II erosion and sediment control provision are estimated to be **$500.4 million**.

Exhibit 4–11. Estimated National Phase II Construction Compliance Costs by Climatic Zones for Year 1998 (1998 Dollars)

Climatic Zone	Representative City	Number of Starts 1–2 Acres	Number of Starts 2–4 Acres	Number of Starts 4–5 Acres	Total Starts	Costs for Starts 1–2 Acres	Costs for Starts 2–4 Acres	Costs for Starts 4–5 Acres	Total Costs
A	Portland, OR	1,683	1,471	659	3,813	$3,608,528	$8,141,052	$6,360,054	$18,356,897
B	Boise, ID	1,508	1,345	576	3,429	$3,232,932	$7,443,548	$5,556,280	$16,455,088
C	Fresno, CA	2,388	2,018	974	5,380	$5,118,068	$11,171,812	$9,400,679	$26,039,422
D	Las Vegas, NV	7,154	6,256	3,035	16,445	$15,335,047	$34,628,344	$29,276,500	$80,306,157
E	Denver, CO	1,787	1,613	636	4,036	$3,829,714	$8,928,128	$6,135,764	$18,893,606
F	Bismarck, ND	560	469	156	1,185	$1,199,916	$2,595,370	$1,508,877	$5,304,163
G	Helena, MT	1,067	921	348	2,336	$2,287,796	$5,098,377	$3,354,650	$10,740,823
H	Amarillo, TX	3,295	2,838	1,152	7,285	$7,063,767	$15,708,383	$11,110,516	$33,882,666
I	San Antonio, TX	1,105	960	414	2,479	$2,368,045	$5,314,569	$3,997,033	$11,679,647
K	Duluth, MN	2,957	1,796	326	5,078	$6,339,106	$9,939,565	$3,141,089	$19,419,760
M	Des Moines, IA	9,335	7,599	2,695	19,629	$20,009,581	$42,063,182	$26,002,165	$88,074,928
N	Nashville, TN	5,801	4,707	1,705	12,212	$12,434,357	$26,052,990	$16,445,128	$54,932,475
P	Atlanta, GA	5,157	2,956	1,127	9,241	$11,054,430	$16,364,835	$10,875,252	$38,294,517
R	Hartford, CT	6,909	5,324	2,116	14,348	$14,808,848	$29,468,120	$20,412,901	$64,689,869
T	Charleston, SC	1,194	675	263	2,132	$2,560,342	$3,736,824	$2,535,496	$8,832,662
V	Hawaii	504	423	218	1,145	$1,080,648	$2,340,928	$2,099,447	$5,521,023
W,X,Y	Alaska	22	20	8	50	$47,885	$112,127	$72,563	$232,575
Total		52,426	41,389	16,408	110,223	$112,379,010	$229,108,154	$158,284,394	$499,771,558

Note: Number of sites include only those where storm water BMPs are not currently required by Federal or State programs. Totals may not add because of rounding.

Exhibit 4–12. Phase II Erosion and Sediment Control Annual Costs

Construction Costs	Universe	Estimated Total National Annual Costs (1998 dollars)
Compliance Costs	110,223	$499,771,558
Waiver Costs*	19,452	$665,064
Total	129,675	$500,436,622

*Based on an engineering assistant's wage of $34.19 per hour. U.S. Department of Labor, 1996.

EPA also estimated incremental costs attributable to the post-construction runoff control measures. The Phase II municipal program requires municipalities to develop, implement, and enforce a program that addresses stormwater runoff from new development and redevelopment sites on which land disturbance is greater than one acre and that discharge into a regulated MS4. To develop a cost estimate associated with this measure, EPA estimated a per site BMP cost, including operation and maintenance, for 12 model sites of varying size (1, 3, 5, and 7 acres) and imperviousness (35%, 65%, and 85%). The per site BMP cost was then multiplied by the total number of multi-family, institutional, and commercial construction starts that are located in Phase II urbanized areas to obtain a national cost estimate. Using this total of 13,364 postconstruction starts, EPA estimated a range of national costs associated with this measure from $44.6 to $178.3 million (see Appendix B–4). EPA estimates total annual costs to construction operators, including implementation of erosion and sediment controls and post-construction controls, to be between **$545.0 – $678.7 million.**

Exhibit 4–15. Estimated Post-Construction Runoff Control Costs

Area	35% Impervious (Multi-Family Residential)	65% Impervious (Multi-Family/ Commercial/ Institutional)	85% Impervious (Commercial)	Total Cost (1998 dollars)
1 Acre	$503,163	$14,318,035	$25,530,478	$40,351,676
3 Acres	$1,486,961	$29,571,535	$29,588,931	$60,647,426
5 Acres	$2,001,641	$11,835,630	$9,151,038	$22,988,309
7 Acres	$3,863,272	$23,910,571	$26,494,414	$54,268,258
Total Cost	$7,855,037	$79,635,771	$90,764,861	$178,255,669

Summary of results of the total costs of the phase II program are shown below:

Exhibit 4–21. Potential Annual Costs for Phase II Storm Water Regulation

Phase II Element	Universe	Estimated Total National Annual Costs (1998 dollars)
Municipal	32,458,000 Households	$297,318,623
Construction	129,675 Erosion & Sediment Control Starts and 13,364 Post-Construction Starts	$545,000,539 – $678,692,291
Federal and State	53 States and Territories	$5,318,668
Total		$847,637,830 – $981,329,582

Reduced Sediment Delivery From Construction Starts:

To estimate reduced sediment delivery from Phase II construction starts, the US ACE developed a model based on EPA's 27 model sites to estimate sediment loads from construction starts with and without Phase II controls (US ACE, 1998). The US ACE model uses the construction site version of the Revised Universal Soil Loss Equation (RUSLE) to generate sediment delivery estimates for 15 climatic regions with each of the following variations: three site sizes (one, three, and five acres), three soil erodibility levels (low, medium, and high), three slopes (3%, 7%, and 12%), and the BMP combinations from EPA's 27 model sites. The 15 climatic regions represent the various rainfall and temperature conditions throughout the United States. Sediment delivery represents the quantity of sediment that BMPs placed at the base of the hill slope are unable to capture. EPA estimated that the average reduction in soil loss from the model sites implementing BMPs would be 89.6 tons per site. (Calculations in Exhibit 4-24)

To determine the reduction in soil loss using the estimated 80% effectiveness rate, EPA multiplied the weighted average soil loss per start (89.6 tons) by 80%. This resulted in an estimated reduction in soil loss of 71.7 tons per site. Multiplying this reduction by the 110,223 construction starts expected to implement erosion and sediment controls for the year 1998, results in an estimated 7.9 million ton reduction in soil loss annually.

Exhibit 4–25. National Reduction Estimates for Municipalities and Construction Starts (tons/year)

Phase II Element	20% Reduction	80% Reduction
Municipal TSS Loading	639,115	4,062,815
Soil loss from Construction Sites	1,975,196	7,900,785

Summary

EPA has not presented the total cost of prevention of sediments leaving the site per ton of the sediment. ES.11 (in executive summary) describes only the costs effectiveness related to the Municipal TSS loading reduction. It seems that by a simple

calculation from the two former exhibits (4-24 and 4-25) that the total cost assuming 80% reduction in the sediments would be between $69 - $86 per ton of sediment.

MEMORANDUM

OFFICE OF WATER PROGRAMS
C S U SACRAMENTO
7801 Folsom Boulevard, Suite 102
Sacramento, CA 95826

Date: **August 15, 2003**
To: **Pamela Barksdale, State Water Resource Control Board**
From: **Brian Currier**
Subject: **Scope for the storm water cost survey**

This memorandum presents additional information and recommendations in order to proceed with Task A of the "Survey of Costs to Develop, Implement, Maintain and Monitor Municipal Separate Storm Sewer System (MS4) Stormwater Management Programs (SWMP) and Description of Alternatives for Control of Stormwater Quality in Los Angeles County" (See Attachment A). A presentation of candidate municipalities, corresponding demographics, and recommendations for the six municipalities to be surveyed are presented herein.

Nomination of Municipalities

The identification of candidate municipalities began with a conference call on June 23, 2003 with the State Water Resources Control Board and representatives from interested Regional Water Quality Control Boards. The scope and intent of the study was shared with the conference call participants. The Regional Boards then nominated municipalities within their jurisdiction that appear are complying with their permits and are taking appropriate steps toward meeting water quality objectives. Some nominees were subsequently eliminated upon further discussion with either the municipality or the regional board. The remaining municipalities are presented in Table 1 along with a limited set of city characteristics.

Table 1. Nominated Municipalities for the Stormwater Cost Survey

CITY	TOTAL POPULATION	AREA (Sq. Miles)	MEDIAN INCOME/ HOUSEHOLD ($)	MEAN INCOME ($)	INCOME DENSITY ($/ft^2)	STORM WATER DRAINAGE SYSTEM FUND
CALIFORNIA	33,871,648	163,696	47,493	22,711	0.2	
Los Angeles	3,694,820	498	36,687	20,671	5.5	Yes
Fresno	427,652	105	32,236	15,010	2.2	Yes
Sacramento	407,018	99	37,049	18,721	2.8	Yes
Oakland	399,484	78	40,055	21,936	4.0	Yes
Anaheim	328,014	50	47,122	18,266	4.3	Yes
Fremont	203,413	87	76,579	31,411	2.6	No[1]
Huntington Beach	189,594	32	64,824	31,964	6.9	Yes
Ontario	158,007	50	42,452	14,244	1.6	Yes
Santa Clarita	151,088	48	66,717	26,841	3.0	Yes
Salinas	150,724	19	43,720	14,495	4.1	Yes
Santa Monica	84,084	16	50,714	42,874	8.1	Yes
Encinitas	58,014	20	63,954	34,336	3.5	No
Poway	48,044	39	71,708	29,788	1.3	Yes
San Clemete	49,861	18	63,507	34,169	3.3	Yes

Selection Criteria

In order to present compliance costs that are representative of the widest range of California environments, a diverse selection of municipalities from the nominees is recommended. The primary factors considered are location, population, income, rainfall, and whether a stormwater drainage system (SDS) fund exists. Location is given the highest priority to ensure that the results of this survey have the widest statewide applicability. A comment from the conference call participants was to place a high priority on whether a city had a separate storm water fund. This is an indication that the city currently accounts for stormwater related expenses, allowing for further analysis of those costs. Population and income are both considered important factors, but their relative importance is unknown at this time. To make the study results more useful to other communities, it is generally sought to include both large and small cities and include cities with a variety of income parameters. Including at least one municipality with a population smaller than 100,000 will help in understanding cost for smaller cities (including NPDES Phase II municipalities). Income is a consideration as higher income communities generate a higher tax base. This may not directly relate to stormwater expenditures, but at this point it should not be ignored if it proves to be a factor. Rainfall was not a major consideration. Selecting cities by location (different geographical areas) adequately represent the range of rainfall. The range of rainfall of the candidate cities is 10 to 23 inches per year.

[1] Footnote added 1/20/05: Fremont does have a drainage fund; the original memorandum was incorrect.

Selection Recommendations

In considering location, the state can be divided into three sections: north, central, and south. For this exercise, the dividing lines are roughly south of San Jose and north of Santa Clarita. Each section is further distinguished between coastal and inland areas. Thus, one coastal and one inland municipality can be recommended from each section.

For Northern California, Fremont, Oakland, and Sacramento are nominated. Sacramento is the only inland city and it has a storm water fund. For coastal areas, Oakland has the advantage over Fremont because of its storm water fund. Oakland also offers a higher population density compared to Sacramento and Fremont. Based on these observations Sacramento and Oakland are recommended for the cost survey, if Oakland can overcome some timing issues regarding availability of staff time to support this project. If not Fremont could be substituted.

For Central California, Salinas and Fresno are nominated. They are ideal for location (coastal vs. inland), size (151,000 vs. 428,000), and income density (4$/ft^2 vs. 2$/ft^2). Therefore, Salinas and Fresno are recommended for the cost survey.

For Southern California, the selection is a bit more complex. San Clemente, Anaheim, Huntington Beach, Ontario, Santa Clarita, Santa Monica, Encinitas and Poway are nominated. Because smaller size communities have not been selected anywhere in California it is recommended that one of the two municipalities in Southern California be smaller (i.e. San Clemente, Santa Monica, Encinitas, or Poway). Encinitas (pop 58,000), is recommended based on their small size and upon the strong recommendation by the San Diego Regional Board. Ontario is the furthest inland, followed by Santa Clarita. The Regional Board highly recommends Ontario, and it also has a stormwater fund. Ontario's willingness to participate has not been confirmed, but their staff that was initially contacted suggested participation may not be a problem. Encinitas and Ontario are recommended for the cost survey.

Although it was not used as a criterion in the above process, income characteristics vary adequately among the recommended municipalities.

Final selection of municipalities will be made after further consultation with you and the Technical Advisory Group.

Please call me with any comments or questions at (916) 278-8109.

Appendix J TAG Comments

This appendix contains a description of the Technical Advisory Group (TAG), written TAG comments, and action items from the final meeting with the TAG. In the action items, the study team condensed all applicable TAG comments each affected section of the report. Additional notes that did not result in changes to the report are listed after the action items.

TECHNICAL ADVISORY GROUP MEMBERS

Dr. Steven Frates is a Senior Fellow at the Rose Institute of State and Local Government at Claremont McKenna College. Dr. Frates has extensive experience in public policy analysis, with particular emphasis on local government finance. He has served as an assistant in municipal government, as the executive director of a major metropolitan taxpayer association, and on the California Constitutional Revision Commission. Dr. Frates has been a faculty member at the University of Colorado and the University of Southern California, and has lectured at other universities and colleges.

Dr. Jay Lund, is Professor of Civil and Environmental Engineering at the University of California in Davis. Dr. Lund's research involves application of systems analysis, economic, and management methods to infrastructure and public works problems. His recent work is primarily in water resources and environmental system engineering. While most of this work involves the application of economics, optimization, and simulation modeling, his interests also include more qualitative policy, planning, and management studies. His work has applied contemporary methods in cost-effectiveness and benefit-cost analysis to evaluate stormwater quality control measures, including both their costs and their likely water quality benefits. Dr. Lund is a past editor of the ASCE Journal of Water Resources Planning and Management and is a member of the International Water Academy.

Dr. Bowman Cutter is a professor of water resources management at U.C. Riverside in the Department of Environmental Sciences. His research examines cost-effective water pollution regulation, environmental federalism, and state and local environmental enforcement efforts. Current projects examine the effect of water pricing on water pollution and analyzing the cost-effectiveness of using stormwater to recharge Los Angeles area aquifers. He currently serves on the Southern California Association of Government's Water Policy Task Force.

Eugene Bromley is an environmental engineer with the Environmental Protection Agency. Mr. Bromley has 25 years experience in water quality protection. As stormwater coordinator in EPA Region 9, Mr. Bromley provides expertise to the stormwater programs in California, Arizona, Nevada, and Hawaii. In California, he participates with the California Stormwater Quality Association, giving updates on EPA policy and projects that could affect the members of CASQA.

Dan Radulescu is a senior engineer with the L.A. Regional Water Quality Control Board, MS4 stormwater permit coordinator. Mr. Radulescu has a P.E. registration in civil engineering with the state of California. Mr. Radulescu has extensive experience with stormwater implementation costs and levels of compliance. He was the primary author of a report that reviewed and analyzed stormwater budget data submitted to the Regional Board by L.A. Region permittees.

Robert Hale is a Supervising Scientist for the Alameda County Public Works, Clean Water Division. Mr. Hale is on the Board of Directors for the California Stormwater Quality Association, where he also serves as an Executive Program Committee member. He has many years of experience with stormwater programs, from his work with Alameda County and from his participation and consultation with other stormwater programs throughout the state.

Steven Sedgwick is an environmental engineer with Camp Dresser & McKee Inc. Mr. Sedgwick has more than 35 years of experience in comprehensive drainage and stormwater planning, stormwater utility evaluations, feasibility studies, pilot plant investigations, regional water resources planning, river basin planning, water and wastewater facilities design, land application and site-specific studies, value engineering and engineering assistance during construction.

TECHNICAL ADVISORY GROUP COMMENTS

- GENERAL COMMENTS: For the 2002-3 data, I think that you did an excellent job of collecting and analyzing fragmented and somewhat non-commensurate data in order to look at the costs from two years ago. I also appreciate the depth of thought that went into your discussion of possible future costs (regardless of the shortcomings mentioned above). The nature of the available information has, I think, necessarily limited your ability to predict accurately the magnitude of costs associated with the recently added permit requirements. As a result, the report would seem to be most useful as a baseline or starting point for future cost documentation efforts. (Hale)
- GENERAL COMMENTS: First, we want to commend the research team for their outstanding job to find, if not some definitive answers, at least the right questions regarding this difficult subject of the relationship between costs and the MS4 permits implementation. It is difficult because MEP is not a clearly defined standard, MS4 permits language depend strongly on the local conditions and the willingness of the local communities to implement those requirements to protect water quality in the existing fiscal conditions. There is little guidance, if any, on this subject, and the estimates on the stormwater program implementation varies wildly depending on the initial premises for the study. Another difficult component is to determine a direct relationship between costs and water quality improvements. If we have any comments, they are triggered by the complex nature of the subject and not necessarily because of any shortcomings of the research itself. As we said, very few nationwide studies are focusing on this subject and even U.S. EPA has provided very little guidance on the subject. We also want to point out that this study focuses on the costs, and not necessarily on the benefits in water quality from the measures implemented due to MS4 permits. Therefore the reader of the study must keep in mind that there is an additional dimension of the economic equation when assessing the implications of MS4 permits costs to give a balanced view of the whole issue. (Dan)
- GENERAL COMMENTS: Due to inherent limitations, the research did not evaluate the impact in funding options, Stormwater Utility Fee vs. General Fund. Cities that rely on the General Fund to cover costs of compliance face different challenges than those with a separate, stable and dedicated funding mechanism. It is also true that municipalities funding their storm water MS4 permit costs through General Fund have a higher tendency to apply pre-existing programs, such as street sweeping, trash collection, storm

drain maintenance, etc., and their costs to the mandatory costs of compliance. In their case, it is even more difficult to discern the origin of costs in pre-existing, new, enhanced, in the absence of clear guidelines. In extreme instances, in some cases of municipalities depending on General Fund and pre-existing programs, contingent on how the requirements of the permit and costs are interpreted, the cost of compliance can vary from low hundreds of thousand dollars to a high dozen million dollars (!) per year for the same small municipality. A number of municipalities even pointed out this discrepancy, based on different interpretations, in their annual reports. This lack of guidance also fuels the debate of the correct impact of MS4 permit compliance costs that can vary from single to hundreds of dollars(!) per household per year. Obviously there is a significant difference from manageable to exorbitant costs. Unless there are clear guidelines and transparency on how to determine the correct compliance costs with MS4 permit requirements we will face this debate from reasonable to exorbitant for years to come.

- WATER QUALITY (Sect. 3) Review major water quality problems that SW Program addresses for each city (Lund)

- IDENTIFYING TRUE COSTS: Establish a 1990 costs baseline and then determine what are the true additional costs due to the stormwater regulations by comparing the 1990 baseline with the data investigated (2002-03). One example is to use per capita costs: if in 1990, the city was spending $10/y/capita for street sweeping, in 2002 the cost (in dollars adjusted for inflation) would be (e.g.)$14/y/capita. Then determine the portion attributable to the SWMP implementation and MS4 permit compliance. Only this type of transparent analysis will reveal the true additional costs, new financial burden, mandated by the existing MS4 permits. This type of analysis may add new findings to the one identified presently in the study. This approach should be used for street sweeping, catch basins and storm drain system, trash collection, hazardous waste recycling programs, flood control component of the city's overall stormwater management, etc…

  How these facts impact the conclusion of the research?

  These types of observations are very important since they reveal the significant importance of such expenditures, such as street sweeping, in the make up of the attributed costs for compliance with the MS4 permits.

  This is even more necessary for cities that depend solely on General Fund money to comply with the MS4 permit requirements. Many pre-existing, well-established programs, in some cities, count now as "exorbitant" MS4 permit costs compliance, when the only change was to move the expense from one column into another in the cities financial reports. (Dan)

- COST/DATA REPORTING: We suggest that a better option for reporting is to use GASB or similar standardized approaches to costs and infrastructure inventory may be a better way to assure transparency. The ways suggested by the research to report cost data seem reasonable, but if this effort can be tied to an existing standardized approach, such as GASB, that may be very valuable since it will provide for consistency statewide and even nationwide. It may be that GASB does not cover all reporting categories. The reporting may use a hybrid between the existing GASB itemization and the approach suggested by the research. An additional approach maybe to lobby the GAS Board to make changes in the accounting rules to allow for water quality itemization. (Dan)

- COST ALLOCATION BY CATEGORY: I would replace the regressions with the interesting analyses contained in appendix G as a starting point. First look at how much the variation in the cost of each program component contributes to the overall cost variation. It appears that the variation in the Municipal category is the biggest driver. However, what I am not sure is whether that is because categories are not consistent across cities and different cities place different costs in the municipal category. Please comment on that possibility. It looks like the variation in overall management is the second biggest driver of the overall cost variation. Again, please comment on whether this is due to "true" cost differences or category-confusion. A very rough statistical methodology to tease this out is to find out the correlation coefficients between each of these two categories and each of the other categories. If you find some strong negative correlations, this is an indicator that really the cost differences are just due to category confusion. In the end this may be a topic that calls for a more qualitative answer. I would like to see a discussion of, taking into account what you know about data quality, whether you think the high cost/household cities tend to have higher costs across the board, or whether their higher costs are generally due to having higher costs in one category or another. From the data, the latter appears to be true, but I don't have a sense of the data quality and how the categories are affected by cost-shifting. (Cutter)
- BUDGET/COST ALLOCATION: (table 6.2) Can percentages of cost assignment add up to 100% to show how the total budget is allocated? (Lund)
- INDUSTRIAL PROGRAM COST PER INSPECTION AND SITE, AND THE EQUIVALENT NUMBERS FOR THE CONSTRUCTION PROGRAM COSTS. Both these programs have almost order of magnitude differences in costs. Please write up the reasons for these differences more thoroughly. I suspect that some of the reason for these large cost differences is cost-category confusion. You should indicate whether you think that is the case, and then indicate which citie(s)' normalized inspection costs you judge to be most satisfactory and why. I know this is going out on a limb, but few observations call for a more qualitative analysis. The large cost ranges diminishes the amount of information in the report and an indication of where the cost numbers likely lie for your best data cases would add quite a bit. (Cutter)
- STREET SWEEPING COSTS: Another possible angle to examine the overall cost range is to break out street-sweeping vs. non-street-sweeping expenditures, since street sweeping seems to be the largest element of the biggest category, and see what the cost/household ranges are in this breakdown. Then you could comment on whether street-sweeping costs are the big driver behind cost differences. Further, you could remark on whether it appears that some communities are doing more street-sweeping than necessary to comply with their permit (do we have a curb miles swept and total curb miles for each city?).(Cutter)
- STREET SWEEPING COSTS: (Table 9.3) Explain street sweeping unit and $cost/curb mile swept variability, in particular the low/high values. (Lund)
- STREET SWEEPING COSTS: On page 52, the paragraph just above the Table 9-5, states: "cost savings can be realized if cities are allowed to focus on the most cost effective programs rather the following overly prescriptive permit requirements." For example, since street sweeping is the most significant share of the stormwater costs maybe it

should be determined if this program is also cost effective the way it is performed presently. This is one avenue to improve the cost-effectiveness relationship. Why spend a significant amount of money if the impact may be insignificant? Some studies in the literature suggest that fact. Secondly, the permits are "overly prescriptive" in many instances due to Permittees specific request to the Regional Board for clarification and guidance in the permits on what they are required to accomplish, when and how. (Dan)

- WATERSHED MANAGEMENT COSTS (Sect. 8 ,Pg. 44) Elaborate on watershed management cost (Lund)
- TMDL COSTS: We strongly recommend the inclusion of TMDL portion of the report in a separate attachment or appendix. The TMDLs cost review were not part of this proposal. The costs vary in a wide range, based on various assumptions and scenarios, none of the cities are currently implementing TMDLs via a MS4 permit. We believe that the inclusion of TMDL discussion in the body of the main report will confuse things. The job of accurately estimating TMDLs implementation costs is complex and open to many interpretations. It is opportune to present various ranges and costs under the research done up to date but we are a long way to agreeing on one set of values. Therefore we believe that the TMDL research on future costs should be included in an Appendix to the report. (Dan)
- TMDL COSTS: p.55 section headed Adding future costs…This is pretty unclear, either expand it or drop it. I think you mean to say something like if current cost estimates are X, and TMDL estimated costs are Y, total costs should be something less than X+Y since current and TMDL expenditures overlap. But I am not quite sure that is what you mean. (Cutter)
- LAND ACQUISITION COSTS: The Advanced Treatment (Gordon, et al.) discussion mentions that land costs were included in that $37 billion cost estimate. However, Section 9 draws in part from Appendix H. Most of the discussions of treatment system examples in the Appendix do not make it clear whether land acquisition costs were included in the cost figures given. In my view, this omission tends to weaken the credibility of the figures used. In the case of the Tule Ponds (the one with which I am most familiar) the $360,000 cost figure does not include any consideration of land costs. The site was, and is owned by the Flood Control District so no purchase price is included. The Authors do touch on the subject when they mention in some examples how land necessary for other purposes (e.g., parking lots) can be put to dual use for stormwater treatment (which makes land acquisition unnecessary). However, the dollar figures given for the various systems need to include mention of whether land costs were included and what they might be if the were not. This is especially true (as you point out) in densely populated urban areas. In the Tule Ponds case, if land were to be purchased on the open market in the center of Fremont, the total cost of the project would be an order of magnitude higher. On the issue of land costs being lower in less densely populated areas (a point that the report makes). In the San Francisco Bay Area, the need for treatment is greatest in densely urbanized areas and almost non-existent in rural areas. In our area, population density tends to increase as one moves toward the Bay. Since stormwater can't really be pumped uphill to treatment facilities, our need for such facilities tends to

be greatest exactly where land prices are highest. This limits our flexibility in locating treatment facilities based on land costs. (Hale)

- DUAL BENEFITS: It is not clear how to account for dual benefit activities. In the case of city of Sacramento, pump station cleaning may be attributable also to maintaining the hydraulic integrity of the system, a water quantity, flood control issue, not necessarily due to water quality concerns. (Dan)
- DATA ANALYSIS: More can be done on the attempts to define what factors lead to higher or lower costs for total costs as well as element by element. The first step is to relegate the various regression analyses to appendices or to drop them altogether. Seven observations are not sufficient for a statistical analysis. This is evidenced by the confidence intervals in Figure 1, which appear to be below zero for three cities. However, there is even less information in this regression than it first appears. Comparing aggregate stormwater spending to aggregate household income is somewhat misleading because they are both driven simply by the overall size of the city. A better regression would be per-household stormwater spending on household mean or median income. I suspect the R2 would be quite a bit less and the confidence intervals correspondingly greater. My recommendation is to simply drop the regressions from the body of the report. (Cutter)
- DATA ANALYSIS: (Section 9.1) Analysis seems simplistic. Should cost be related to the problem, which might be proportional to population or level of economic activity? Cost/ HH values need to be further explained. (Lund)
- DATA ANALYSIS: p.52 2nd par. Sentence beginning with: The present worth cost… please explain this sentence further, why is there such a large cost range? Explain to the reader why the cost-per-acre and cost-per-volume estimated difference and the range in the land prices. You can do this in a footnote. (Cutter)
- DATA ANALYSIS: Explain rainfall as the best indicator for cost (Lund)
- VARIABILITY IN COSTS AMONG CITIES: I would like a final summing up in the report of why the overall cost/household range is large. Again, this will probably have to be more qualitative, but I think that is fine. I would like the reader to come away with a sense of why one city has costs almost three times larger on a per-household basis. That qualitative analysis should think through the following questions: 1) even within the category of cities with good stormwater programs are some cities doing a lot more activities than others?; 2) If so, is the extra activity necessitated by say, greater amounts of construction or other factors? Are some cities in the midst of infrastructure activities so that you would expect say a three year average of stormwater costs to be in a much closer range? Perhaps you will conclude that the cost differences are really inexplicable given what you know. If so, that in itself is interesting and you should suggest further avenues for research into hypotheses suggested by your experience in this project and explain why this research does not give insight into the reasons behind the large cost range. (Cutter)

TAG MEETING NOTES FROM DECEMBER 14, 2004:

Action Items

1. Clarify that, beyond the objectives identified in the report and contract, this report also serves as a step toward establishing cost numbers to be used in budgeting and cost/benefit evaluations. Note that this report does not address the benefits of those permit required stormwater activities that are assumed to improve water quality. Note that the reports use as a budgeting tool may only be timely for Phase II permittees. **Location of Change: pg ES-1, Section "Task A"; Section 1, section "Task A"**

2. Double check consistency of classifying costs (e.g. existing, enhanced, new). Add discussion defining these terms and discuss the likelihood that enhanced cost is, for the most part, pre-existing. Display graphically. Note any differences between the accounting practices of cities with a SW utility fee and those without, especially regarding the amount of the costs that are 'existing' or 'enhanced'. If apparent from the study, discuss the relative importance of having a fee versus having a designated fund, without a fee to fund it. **Location of Change: Figure 9.4 and Section 2.5 and additions to Section 9.1, p49.**

3. Replace the regressions in report with qualitative discussion on cost differences between cities. List major water quality control strategies and affected water bodies for each city. This may help explain some cost variation. Explain differences in cost between cities qualitatively. (e.g. Fresno low because joint use facilities, permeable soils, available land). Note any large infrastructure campaigns of the cities. Move regressions to appendix with the note that we tried various correlations but a model was not successfully developed, partly due to the small sample size. Only do regressions on normalized cost, not aggregate costs, which are only a surrogate for city size. Include a note in the body of the report that the failure of the regressions was expected due to small sample size and that the regressions are presented in an appendix as anecdotal information.
   Location of Change: Discussion additions and modifications to Section 9.1, Deleted regression figures in ES and section 9.

4. Move TMDL and future cost discussion from Section 9 to an appendix. Add a note to the appendix and executive summary that Task B research was done assuming the MS4 permitting process as it stands presently, using an iterative process of enhancing implementation of BMPs. This scenario may overlap with TMDL process, but it is not necessarily the same. TMDLs may be folded in MS4 permit as allocations, as appropriate, depending on the impairments to receiving waters. Note that the costs for LA may be specific for LA only and are difficult to extend to other areas with

different characteristics. **Location of Change: Note added to Introduction and modified discussion moved to appendix G**

5. Downplay comparisons between TMDL costs, which are future costs that are variously estimated, and MS4 permit compliance costs incurred by the cities surveyed costs. TMDL cost estimates are total costs and not the cost to the cities exclusively. Similarly, note that Gordon costs are city-only costs. Take Gordon costs out of table in Executive Summary and discuss in the text.
   Location of Change: Section 9 future cost discussion, including TMDLs, modified and moved to Appendix G. Gordon costs taken from ES table and moved to text

6. Add TAG comment section in Section 10 on cost tracking benefits. Propose that if the permittees have a correct cost accounting/reporting system, they would be granted an additional quantity of points towards their receipt of a grant under a state/federal program; for example, Section 319(h) grants are evaluated on a point ranking system that is established by a state. If the cost accounting/reporting information were tabulated pursuant to the state's suggested format, that applicant would receive a bonus allotment equal to a boost in total points of approximately 15 percent. This would alert that permittee to the benefit in competing for these grants as a pre-requisite to establishing the appropriate cost accounting system. The proposed system would benefit from review and acceptance by the California League of Cities. Note the process in developing consistent cost reporting in the region and the associated benefit to the city with developing and justifying stormwater utility fees. Note that our recommendations for cost reporting are only the first step in this process of developing consistent cost reporting. This process includes notifying cities of reporting goals, identifying whether costs are minor and local and applicable to other cities, review reported costs for quality and consistency, and provide feedback to the cities. Identify appropriate categories with definitions to allow clarification between differences; with appropriate definitions, the individual entities could probably better assist the permittees to understand the benefit of reporting costs in a correct fashion. For example, a reported cost item may be illegal discharge elimination and would have clarified definitions to differentiate between end-of-pipe actions, in-pipe actions, source identification, and source detection. **Location of Change: Discussion added to Section 10.2 and 10.3, pages 51 and 56. Regressions moved to Appendix G.**

7. Make sure legal fees are properly discussed. Appellant fees are excluded, but legal advice on program implementation and response to citizen suits are included. We assume that if legal fees are incurred, it is part of the cost of doing business. This is not an assumption that all lawsuits are frivolous and therefore attorney fees are justified expenses. Neither is it an assumption that all legal advice is to challenge the lawsuit rather than to acquiesce to the demands of the lawsuit. **Location of Change: See discussion in section 9.5**

8. Append all written TAG comments to the report. **Location of Change: See Appendix J.**

9. Report cost without existing and enhanced 'big-ticket' items such as street sweeping trash collection, storm drain maintenance, drain line cleaning, channel cleaning, and pump station cleaning, recycling, hazardous waste roundups, etc. Note that an unknown portion of an "enhanced" cost is appropriate to count toward the additional financial burden of permit compliance. Also, include a suggestion that a three years average, 1987-1990, may be used as a baseline cost to figure out "enhancement" portion costs based on the post 1990 MS4 permit requirements and caveat that unit cost for sweeping varies. Note that sweeping is an enhanced cost and the majority of effort pre-existed the first stormwater permits. Also caveat that all programs may still have hidden costs that could not be identified by the cities. An example is backup equipment for street sweeping, but note that these costs are also preexisting. **Location of Change: See section 9.4 for added discussion of existing and enhanced costs and see Section 2.5 for discussion of using baseline costs.**

10. Consider using pie charts for each city to show distribution of costs among categories. **Location of Change: See individual city sections (sections 3-8)**

11. Note that Post Construction costs are expected to increase as cities move into full implementation of SUSMP type requirements for new development and redevelopment. Note that the reported costs are particularly misleading for cost projection purposes since the research coincides with the start of SUSMP type requirements implementation. **Location of Change: Section 9.5, Qualitative Discussion of Stormwater Costs for Selected Cost Categories**

Additional meeting notes

1. Cities may try to push as much general fund expenses as possible to stormwater a fee, but public response to fees helps balance cost. [I believed we discussed that cities successful in passing a SW fee were very transparent in the process, limited in scope, and going to great lengths to tie the SW fee to activities and capital investments related directly to water quality enhancements and benefits. Probably is not a bad idea to put some positive "lessons learned" from those successful cases in passing a SW fee.] (Dan)
2. GASB 34 may not be a realistic method to encourage cost reporting, especially on the short term. [is there a way to move this idea at a national level? That GASB can develop some standards for such a purpose, or add to an existing one?] (Dan).
3. Hamilton County, Ohio costs were not captured till 2001, for Phase II non-Cincinnati areas. Took two years to establish more consistent cost reporting. The cost had been

accounted for from 2001 through 2003 for Phase II cities, but that even these costs were "too vague" to allow appropriate interpretation by all 44 permittees. When CDM conducted the next evaluation required to establish a charge for these functional activities, CDM had to more precisely define the activities and quantify the level of effort for each action (Steve).

4. Wisconsin and Florida: cities are given points for having a fee, points awarded if utility charges are above $3.50 (80), below (40), and none (0). Points are a criterion for grant applications. Expand the last sentence to read “This approach would assure that permittees competing for grants would receive between 15 and 20 percent bonus points in the priority ranking system utilized by these states to award grants” (Steve).
5. Average cost per billing unit is $2.92/month for all stormwater including flood. Only for cities with stormwater fund/fee. Insert “Based upon evaluations conducted for stormwater utilities charging a stormwater user fee as of December 31, 2003, the total monthly charge per residential dwelling unit was $2.92/month. The services provided for this fee included all components that a given jurisdiction was incorporating into the stormwater management program, but could have been augmented/supplemented with additional monies from other sources that weren't clear in the writer's review. However, greater than 75 percent of those systems reviewed included some costs for quantity management in this fee.” (Steve). [See my comment at first point, it seems that a focused SW quality fee will be on average much less that $3/month/billing unit. city of LA with its current $18/yr/household seems to be right there, at the average.] (Dan)

CPI-U Summary by Fiscal Year
Average Annual FY CPI-U

Year	CPI-U First Half Jan - Jun	CPI-U Second Half July- Dec	CPI-U FY First Half July 1 - Dec 31	CPI-U FY Second Half Jan 1 -Jun 30	CPI-U FY	AVG Annual FYCPI-U	*Claimants Proposed CPI -U*	*Claimants Proposed % increase*
2006	226.7	229.6	229.6	**231.87**	FY 06/07	230.735	*1*	*0*
2007	**231.87**	**234.772**	**234.772**	**242.44**	**FY 07/08**	238.606	***1***	***0***
2008	**242.44**	**242.185**	**242.185**	**240.885**	**FY 08/09**	241.535	***1.0385***	***3.8***
2009	**240.885**	**243.655**	**243.655**	244.242	**FY 09/10**	243.9485	***1.0384***	***3.8***
2010	244.242	246.686	246.686	252.451	FY 10/11	249.5685	*1.052*	*5.2*
2011	252.451	253.368	253.368	256.637	FY11/12	255.0025	*1.084*	*8.4*
2012	256.637	257.285	257.285	258.955	FY 12/13	258.12	*1.1013*	*10.1*
2013	258.955	261.679	261.679	265.251	FY 13/14	263.465	*1.1157*	*11.6*
2014	265.251	265.039	265.039	267.346	FY 14/15	266.1925	1.1364	13.6
2015	267.346	271.526	271.526	272.628	**FY 15/16**	272.077	*Source Quenzer Declaration, Section 11*	
2016	272.628	276.837	276.837	281.561	FY 16/17	279.199		
2017	**281.561**	**284.464**	**284.464**	**290.076**	**FY 17/18**	**287.27**	**Commission End Date of Reimbursement**	
2018	290.076	295.018	295.018	298.147	FY 18/19	296.5825	**12/31/2017**	
2019	298.147	300.718						

Notes:

Example CPI Calculation

xxxx *Recession Dec 2007 - June 2009*

(199.5 – 100.0)/100.0) x 100 = 99.5%

xxxx *Recovery 2015*

0.15367196 1.153671961

Did not recover to 5% until 2015, nearly eight years after the beginning of the recession. Real median household income did not recover to pre-recession levels until 2016

An index starts in a given year, the base year, at an index number of 100. In subsequent years, percentage increases push the index number above 100, and percentage decreases push the figure below 100. An index number of 102 means a 2% rise from the base year, and an index number of 98 means a 2% fall.

Source: US Bureau of Labor Statistics

Consumer Price Index for All Urban Consumers (CPI-U)
Original Data Value

Bureau of Labor Statistics

Series Id: CUURS49ESA0
Not Seasonally Adjusted
Series Title: All items in San Diego-Carlsbad, CA, all urban
Area: San Diego-Carlsbad, CA
Item: All items
Base Period: 1982-84=100
Years: 2005 to 2024

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	HALF1	HALF2
2005													220.6	218.3	222.9
2006													228.1	226.7	229.6
2007													233.321	231.870	234.772
2008													242.313	242.440	242.185
2009													242.270	240.885	243.655
2010													245.464	244.242	246.686
2011													252.910	252.451	253.368
2012													256.961	256.637	257.285
2013													260.317	258.955	261.679
2014													265.145	265.251	265.039
2015													269.436	267.346	271.526
2016													274.732	272.628	276.837
2017											285.961		283.012	281.561	284.464
2018	288.331		290.810		289.243		295.185		295.883		293.858		292.547	290.076	295.018
2019	295.761		297.226		300.303		299.333		301.033		301.520		299.433	298.147	300.718
2020	302.564		302.589		301.317		305.611		304.443		306.334		303.932	302.040	305.823
2021	307.688		315.035		317.141		323.906		324.138		326.422		319.761	314.282	325.241
2022	332.990		339.852		343.502		347.462		350.721		348.145		344.416	339.886	348.945
2023	354.453		358.026		361.339		362.412		367.185		366.343		362.022	358.515	365.529
2024	367.917		370.858		372.858		375.072		376.221					370.987	

Source: Bureau of Labor Statistics

Generated on: October 13, 2024 (03:31:27 PM)

U.S. BUREAU OF LABOR STATISTICS

Databases, Tables & Calculators by Subject

Special Notices 4/25/2024

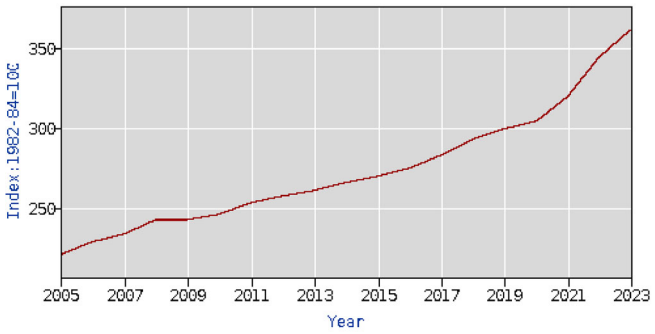
Change Output Options: From: 2005 To: 2024 GO

include graphs include annual averages More Formatting Options

Data extracted on: October 13, 2024 (3:30:05 PM)

Consumer Price Index for All Urban Consumers (CPI-U)

Series Id: CUURS49ESA0
Not Seasonally Adjusted
Series Title: All items in San Diego-Carlsbad, CA, all urban consumers, not seasonally adjusted
Area: San Diego-Carlsbad, CA
Item: All items
Base Period: 1982-84=100



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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements set forth in this Order.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

David W. Gibson
Executive Officer

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(Cont'd)

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water

discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on October 16, 2012 and it became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766).

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the

expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

    a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San

Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. Integrated Report and Clean Water Act Section 303(d) List. The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for

classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

33. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water

limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are

applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 1a, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 1b, became effective on April 1, 2015, after Order No. R9-2015-0001 was adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

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THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[4] - City of Temecula - City of Wildomar[4] - County of Riverside - County of San Diego - Riverside County Flood Control and Water Conservation District
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

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D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus (Purple Sea Urchin)	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

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(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. Alternative Watershed Monitoring Requirements

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or
[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or
[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or
[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. Wet Weather MS4 Outfall Discharge Monitoring

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 Outfall Discharges Assessments

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;
[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and
[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003(Order No. R9-2015-0013, as it may be amended or reissued) for discharges to surface waters within the San Diego Region:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the

corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees,

and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the

area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4

receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be

addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g.

mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project

site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including

but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that

contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of

concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to

incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. Water Quality Improvement Plan Updates

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the

Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional

Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the

proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

a. Names and addresses of the Copermittees;

b. Names and titles of the primary contacts of the Copermittees;

c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

e. Any other information necessary for the re-issuance of this Order;

f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

g. Any other information required by federal regulations for NPDES permit reissuance.

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by

the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1,

2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention ~~P~~lan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or

will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the dischargers shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special

Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the

discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in

more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be

completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water

Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

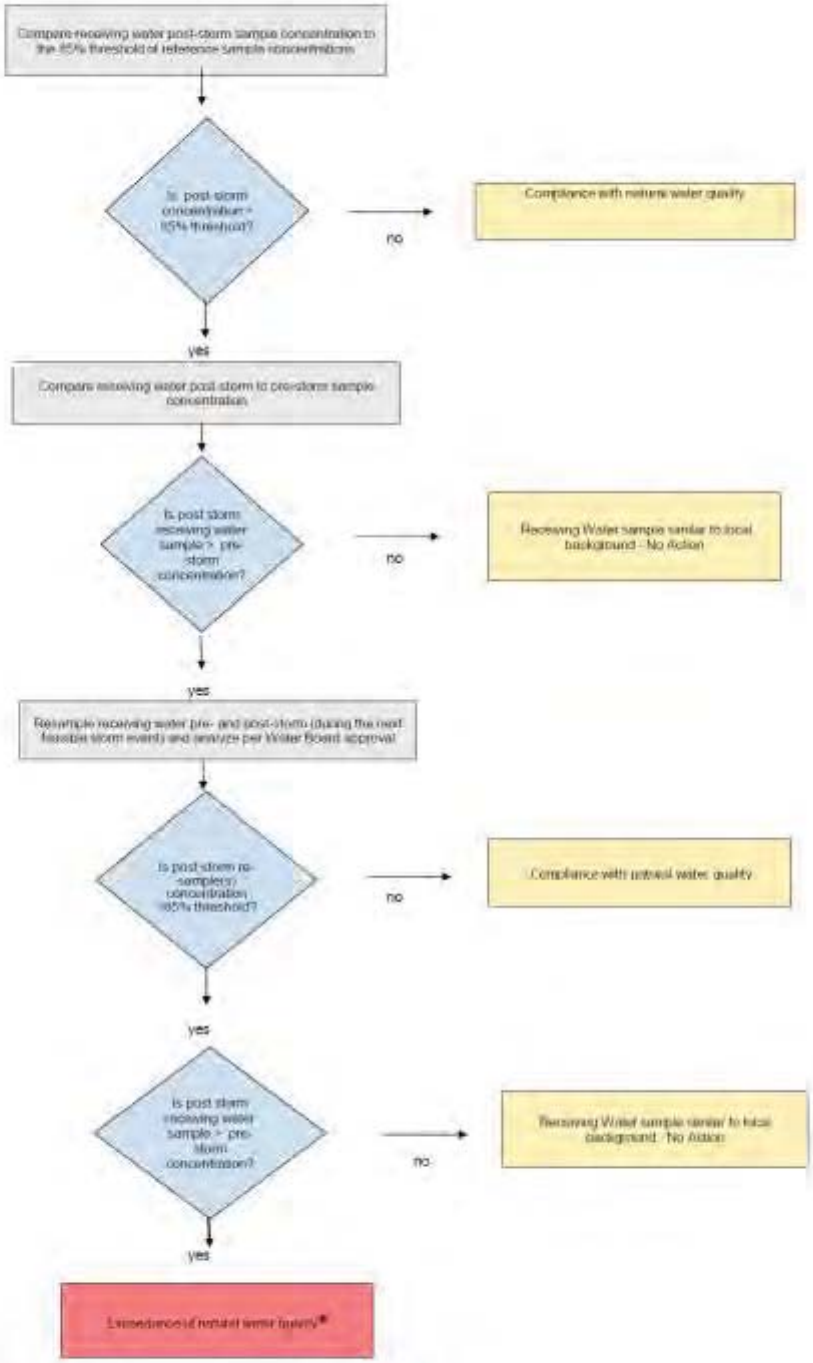
Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality



*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because

of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 1a and became effective on June 27, 2013. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 became effective April 1, 2015. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016.

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov.

(5) When hard copies are requested or required, the Copermittees must submit reports and provide notifications as required by this Order to:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 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. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – 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.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (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. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure. Replacement of impervious surfaces includes any activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES** ☐ **NO** ☐	
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES** ☐ **NO** ☐	

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES** ☐ **NO** ☐	
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES** ☐ **NO** ☐	

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES** ☐ **NO** ☐	

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES** ☐ **NO** ☐	
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES** ☐ **NO** ☐	
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES** ☐ **NO** ☐	

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES** ☐ **NO** ☐	

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES** ☐ **NO** ☐	

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES** ☐ **NO** ☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES** ☐ **NO** ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES** ☐ **NO** ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____ Date _____

Print Name _____ Title _____

Telephone Number _____ Email _____

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

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1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. Interim TMDL Compliance Requirements

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	2009	2013	2017	2009	2013	2017
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	**Dry Weather Final Effluent Limitation**	**Wet Weather Final Effluent Limitation**
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	**Dry Weather Final Effluent Limitation**	**Wet Weather Final Effluent Limitation**
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring
[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-

day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

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storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within

the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

San Diego Water Board

Eric Becker, P.E.
Senior Water Resource Control Engineer
619-521-3364
619-516-1994 (fax)
2375 Northside Drive, Suite 100
San Diego, CA 92108
email: Eric.Becker@waterboards.ca.gov

Christina Arias, P.E.
Water Resource Control Engineer
619-521-3361
619-516-1994 (fax)
2375 Northside Drive, Suite 100
San Diego, CA 92108
email: Christina.Arias@waterboards.ca.gov

Wayne Chiu, P.E.
Water Resource Control Engineer
619-521-3354
619-516-1994 (fax)
2375 Northside Drive, Suite 100
San Diego, CA 92108
email: Wayne.Chiu@waterboards.ca.gov

Laurie Walsh, P.E.
Senior Water Resource Control Engineer
619-521-3373
619-516-1994 (fax)
2375 Northside Drive, Suite 100
San Diego, CA 92108
email: Laurie.Walsh@waterboards.ca.gov

The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
- City of Aliso Viejo
- City of Dana Point
- City of Laguna Beach
- City of Laguna Hills
- City of Laguna Niguel
- City of Laguna Woods
- City of Lake Forest *
- City of Mission Viejo
- City of Ranch Santa Margarita
- City of San Clemente
- City of San Juan Capistrano
- Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
- City of Menifee**
- City of Murrieta
- City of Temecula
- City of Wildomar
- Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
- City of Carlsbad
- City of Chula Vista
- City of Coronado
- City of Del Mar
- City of El Cajon
- City of Encinitas
- City of Escondido
- City of Imperial Beach
- City of La Mesa
- City of Lemon Grove
- City of National City
- City of Oceanside
- City of Poway
- City of San Diego
- City of San Marcos
- City of Santee
- City of Solana Beach
- City of Vista
- San Diego County Regional Airport Authority
- San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information reported by the Copermittees was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This was an unsustainable course that would have continued to demand more resources

from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012. The Office of Administrative Law approved it on July 3, 2013. The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the

federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below:

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance

with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order

allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear “iterative process” for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees’ efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees’ MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees’ MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit*." The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region were phased in as their respective NPDES municipal storm water permits expired. Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar including the portions of the jurisdictions within the Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, footnotes to Table B-1 are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. Footnote 1 to Table B-1 specifies that the Cities of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities of Lake Forest and Menifee are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228.

The Cities of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge

into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively.

The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for*

potential cumulative effects."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1).

Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement

strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality

improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region.

[23] 40 CFR 130.7(b)(1)

According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid
[27] CWA section 502(19)

other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state*." In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design*

and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

> *authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

  The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

  "*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

  Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

  The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by prohibiting runoff from leaving the target landscape [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the previous MS4 permits to apply. However, under these circumstances the San Diego

Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the

functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at

construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to

the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant

sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm

water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent*

practicable" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and

from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to

review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal.

The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are

included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of

Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water

Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the

Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Provision F.5 requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5 also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

DECLARATION OF SERVICE BY EMAIL

I, the undersigned, declare as follows:

I am a resident of the County of Sacramento and I am over the age of 18 years, and not a party to the within action. My place of employment is 980 Ninth Street, Suite 300, Sacramento, California 95814.

On October 17, 2024, I served the:

- **Current Mailing List dated September 26, 2024**
- **Water Boards' Comments on the Draft Proposed Decision and Parameters and Guidelines (Volumes 1-3) filed October 14, 2024**

  San Diego Regional Water Quality Control Board Order No. R9-2007-0001, Permit CAS0108758, Parts D.3.a.(3)(b)(iii), D.5.a.(1), D.5.a.(2), D.5.b.(1)(a), D.5.b.(1)(b)(iii-vi), D.5.b.(1)(c), D.5.b.(1)(d), D.5.b.(2), D.5.b.(3), E.2.f., E.2.g., F.1., F.2., F.3., I.1., I.2., I.5., J.3.a.(3)(c)(iv)-(viii), (x)-(xv), the first sentence of L.1. as it applies to the newly mandated activities, and L.1.a.(3)-(6), 07-TC-09-R County of San Diego, Cites of Carlsbad, Del Mar, Imperial Beach, Lemon Grove, Poway, San Marcos, Santee, Solana Beach, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, San Diego, and Vista, Claimants

by making it available on the Commission's website and providing notice of how to locate it to the email addresses provided on the attached mailing list.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that this declaration was executed on October 17, 2024 at Sacramento, California.

David Chavez
Commission on State Mandates
980 Ninth Street, Suite 300
Sacramento, CA 95814
(916) 323-3562

COMMISSION ON STATE MANDATES

Mailing List

Last Updated: 9/26/24

Claim Number: 07-TC-09-R

Matter: San Diego Regional Water Quality Control Board Order No. R9-2007-0001 Permit CAS0108758 Parts D.1.d.(7)-(8), D.1.g., D.3.a.(3), D.3.a.(5), D.5, E.2.f, E.2.g, F.1, F.2, F.3, I.1, I.2, I.5, J.3.a.(3)(c)iv-viii & x-xv, and L.

Claimants: City of Carlsbad
City of Chula Vista
City of Del Mar
City of Encinitas
City of Escondido
City of Imperial Beach
City of La Mesa
City of Lemon Grove
City of National City
City of Oceanside
City of Poway
City of San Diego
City of San Marcos
City of Santee
City of Solana Beach
City of Vista

TO ALL PARTIES, INTERESTED PARTIES, AND INTERESTED PERSONS:

Each commission mailing list is continuously updated as requests are received to include or remove any party or person on the mailing list. A current mailing list is provided with commission correspondence, and a copy of the current mailing list is available upon request at any time. Except as provided otherwise by commission rule, when a party or interested party files any written material with the commission concerning a claim, it shall simultaneously serve a copy of the written material on the parties and interested parties to the claim identified on the mailing list provided by the commission. (Cal. Code Regs., tit. 2, § 1181.3.)

Adaoha Agu, *County of San Diego Auditor & Controller Department*
Projects, Revenue and Grants Accounting, 5530 Overland Avenue, Ste. 410 , MS:O-53, San Diego, CA 92123
Phone: (858) 694-2129
Adaoha.Agu@sdcounty.ca.gov

Tiffany Allen, Treasury Manager, *City of Chula Vista*
Claimant Contact
Finance Department, 276 Fourth Avenue, Chula Vista, CA 91910
Phone: (619) 691-5250
tallen@chulavistaca.gov

Rachelle Anema, Division Chief, *County of Los Angeles*
Accounting Division, 500 W. Temple Street, Los Angeles, CA 90012
Phone: (213) 974-8321
RANEMA@auditor.lacounty.gov

Donna Apar, Finance Director, *City of San Marcos*
Claimant Contact
1 Civic Center Drive, San Marcos, CA 92069
Phone: (760) 744-1050
dapar@san-marcos.net

Lili Apgar, Specialist, *State Controller's Office*
Local Reimbursements Section, 3301 C Street, Suite 740, Sacramento, CA 95816
Phone: (916) 324-0254
lapgar@sco.ca.gov

Socorro Aquino, *State Controller's Office*
Division of Audits, 3301 C Street, Suite 700, Sacramento, CA 95816
Phone: (916) 322-7522
SAquino@sco.ca.gov

Aaron Avery, Legislative Representative, *California Special Districts Association*
1112 I Street Bridge, Suite 200, Sacramento, CA 95814
Phone: (916) 442-7887
Aarona@csda.net

Ginni Bella Navarre, Deputy Legislative Analyst, *Legislative Analyst's Office*
925 L Street, Suite 1000, Sacramento, CA 95814
Phone: (916) 319-8342
Ginni.Bella@lao.ca.gov

Cindy Black, City Clerk, *City of St. Helena*
1480 Main Street, St. Helena, CA 94574
Phone: (707) 968-2742
ctzafopoulos@cityofsthelena.org

Jonathan Borrego, City Manager, *City of Oceanside*
Claimant Contact
300 North Coast Highway, Oceanside, CA 92054
Phone: (760) 435-3065
citymanager@oceansideca.org

Molly Brennan, Director of Finance, *City of National City*
Claimant Contact
1243 National City Blvd., National City, CA 91950
Phone: (619) 336-4330
finance@nationalcityca.gov

Serena Bubenheim, Assistant Chief Financial Officer, *City of Huntington Beach*
2000 Main Street, Huntington Beach, CA 92648
Phone: (714) 536-5630
serena.bubenheim@surfcity-hb.org

Guy Burdick, Consultant, *MGT Consulting*
2251 Harvard Street, Suite 134, Sacramento, CA 95815
Phone: (916) 833-7775
gburdick@mgtconsulting.com

Allan Burdick,
7525 Myrtle Vista Avenue, Sacramento, CA 95831
Phone: (916) 203-3608
allanburdick@gmail.com

Shelby Burguan, Budget Manager, *City of Newport Beach*
100 Civic Center Drive, Newport Beach, CA 92660
Phone: (949) 644-3085
sburguan@newportbeachca.gov

Rica Mae Cabigas, Chief Accountant, *Auditor-Controller*
Accounting Division, 500 West Temple Street, Los Angeles, CA 90012
Phone: (213) 974-8309
rcabigas@auditor.lacounty.gov

Evelyn Calderon-Yee, Bureau Chief, *State Controller's Office*
Local Government Programs and Services Division, Bureau of Payments,
3301 C Street, Suite 740, Sacramento, CA 95816

Phone: (916) 324-5919
ECalderonYee@sco.ca.gov

Sheri Chapman, General Counsel, *League of California Cities*
1400 K Street, Suite 400, Sacramento, CA 95814
Phone: (916) 658-8267
schapman@calcities.org

Annette Chinn, *Cost Recovery Systems, Inc.*
705-2 East Bidwell Street, #294, Folsom, CA 95630
Phone: (916) 939-7901
achinncrs@aol.com

Carolyn Chu, Senior Fiscal and Policy Analyst, *Legislative Analyst's Office*
925 L Street, Suite 1000, Sacramento, CA 95814
Phone: (916) 319-8326
Carolyn.Chu@lao.ca.gov

Michael Coleman, *Coleman Advisory Services*
2217 Isle Royale Lane, Davis, CA 95616
Phone: (530) 758-3952
coleman@muni1.com

Erika Cortez, Administrative Services Director, *City of Imperial Beach*
Claimant Contact
825 Imperial Beach Boulevard, Imperial Beach, CA 91932
Phone: (619) 423-8303
ecortez@imperialbeachca.gov

Eric Dargan, Chief Operating Officer, *City of San Diego*
Claimant Contact
City Hall, 202 C Street, Suite 901A, San Diego, CA 92101
Phone: (858) 236-5587
Edargan@sandiego.gov

Thomas Deak, Senior Deputy, *County of San Diego*
Claimant Representative
Office of County Counsel, 1600 Pacific Highway, Room 355, San Diego, CA 92101
Phone: (619) 531-4810
Thomas.Deak@sdcounty.ca.gov

Margaret Demauro, Finance Director, *Town of Apple Valley*
14955 Dale Evans Parkway, Apple Valley, CA 92307
Phone: (760) 240-7000
mdemauro@applevalley.org

Tracy Drager, Auditor and Controller, *County of San Diego*
Claimant Contact
1600 Pacific Highway, Room 166, San Diego, CA 92101
Phone: (619) 531-5413
tracy.drager@sdcounty.ca.gov

Eric Feller, *Commission on State Mandates*
980 9th Street, Suite 300, Sacramento, CA 95814
Phone: (916) 323-3562
eric.feller@csm.ca.gov

Donna Ferebee, *Department of Finance*
915 L Street, Suite 1280, Sacramento, CA 95814
Phone: (916) 445-8918
donna.ferebee@dof.ca.gov

Tim Flanagan, Office Coordinator, *Solano County*
Register of Voters, 678 Texas Street, Suite 2600, Fairfield, CA 94533
Phone: (707) 784-3359
Elections@solanocounty.com

Jennifer Fordyce, Assistant Chief Counsel, *State Water Resources Control Board*
Office of Chief Counsel, 1001 I Street, 22nd floor, Sacramento, CA 95814
Phone: (916) 324-6682
Jennifer.Fordyce@waterboards.ca.gov

David Gibson, Executive Officer, *San Diego Regional Water Quality Control Board*
9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340
Phone: (858) 467-2952
dgibson@waterboards.ca.gov

Juliana Gmur, *Commission on State Mandates*
980 9th Street, Suite 300, Sacramento, CA 95814
Phone: (916) 323-3562
juliana.gmur@csm.ca.gov

Catherine George Hagan, Senior Staff Counsel, *State Water Resources Control Board*
c/o San Diego Regional Water Quality Control Board, 2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone: (619) 521-3012
catherine.hagan@waterboards.ca.gov

Shawn Hagerty, *Best Best & Krieger, LLP*
San Diego Office, 655 West Broadway, 15th Floor, San Diego, CA 92101
Phone: (619) 525-1300
Shawn.Hagerty@bbklaw.com

Heather Halsey, Executive Director, *Commission on State Mandates*
980 9th Street, Suite 300, Sacramento, CA 95814
Phone: (916) 323-3562
heather.halsey@csm.ca.gov

Chris Hill, Principal Program Budget Analyst, *Department of Finance*
Local Government Unit, 915 L Street, 8th Floor, Sacramento, CA 95814
Phone: (916) 445-3274
Chris.Hill@dof.ca.gov

Tiffany Hoang, Associate Accounting Analyst, *State Controller's Office*
Local Government Programs and Services Division, Bureau of Payments, 3301 C Street, Suite 740, Sacramento, CA 95816
Phone: (916) 323-1127
THoang@sco.ca.gov

Christina Holmes, Director of Finance, *City of Escondido*
Claimant Contact
201 North Broadway, Escondido, CA 92025
Phone: (760) 839-4676
cholmes@escondido.org

Rachel Jacobs, Finance Director/Treasurer, *City of Solana Beach*
Claimant Contact
635 South Highway 101, Solana Beach, CA 92075-2215
Phone: (858) 720-2463
rjacobs@cosb.org

Heather Jennings, Director of Finance, *City of Santee*
Claimant Contact
10601 Magnolia Avenue, Building #3, Santee, CA 92071
Phone: (619) 258-4100
hjennings@cityofsanteeca.gov

Jason Jennings, Director, *Maximus Consulting*
Financial Services, 808 Moorefield Park Drive, Suite 205, Richmond, VA 23236
Phone: (804) 323-3535
SB90@maximus.com

Angelo Joseph, Supervisor, *State Controller's Office*
Local Government Programs and Services Division, Bureau of Payments,
3301 C Street, Suite 740, Sacramento, CA 95816
Phone: (916) 323-0706
AJoseph@sco.ca.gov

Anita Kerezsi, *AK & Company*
2425 Golden Hill Road, Suite 106, Paso Robles, CA 93446
Phone: (805) 239-7994
akcompanysb90@gmail.com

Joanne Kessler, Fiscal Specialist, *City of Newport Beach*
Revenue Division, 100 Civic Center Drive , Newport Beach, CA 90266
Phone: (949) 644-3199
jkessler@newportbeachca.gov

Zach Korach, Finance Director, *City of Carlsbad*
Claimant Contact
1635 Faraday Ave., Carlsbad, CA 92008
Phone: (442) 339-2127
zach.korach@carlsbadca.gov

Kari Krogseng, Chief Counsel, *Department of Finance*
1021 O Street, Suite 3110 , Sacramento, CA 95814
Phone: (916) 322-0971
Kari.Krogseng@dof.ca.gov

Lisa Kurokawa, Bureau Chief for Audits, *State Controller's Office*
Compliance Audits Bureau, 3301 C Street, Suite 700, Sacramento, CA 95816
Phone: (916) 327-3138
lkurokawa@sco.ca.gov

Michael Lauffer, Chief Counsel, *State Water Resources Control Board*
1001 I Street, 22nd Floor, Sacramento, CA 95814-2828
Phone: (916) 341-5183
michael.lauffer@waterboards.ca.gov

Eric Lawyer, Legislative Advocate, *California State Association of Counties (CSAC)*
Government Finance and Administration, 1100 K Street, Suite 101,
Sacramento, CA 95814
Phone: (916) 650-8112
elawyer@counties.org

Kim-Anh Le, Deputy Controller, *County of San Mateo*
555 County Center, 4th Floor, Redwood City, CA 94063

Phone: (650) 599-1104
kle@smcgov.org

Fernando Lemus, Principal Accountant - Auditor, *County of Los Angeles*
Auditor-Controller's Office, 500 West Temple Street, Room 603, Los Angeles, CA 90012
Phone: (213) 974-0324
flemus@auditor.lacounty.gov

Erika Li, Chief Deputy Director, *Department of Finance*
915 L Street, 10th Floor, Sacramento, CA 95814
Phone: (916) 445-3274
erika.li@dof.ca.gov

Diego Lopez, Consultant, *Senate Budget and Fiscal Review Committee*
1020 N Street, Room 502, Sacramento, CA 95814
Phone: (916) 651-4103
Diego.Lopez@sen.ca.gov

Everett Luc, Accounting Administrator I, Specialist, *State Controller's Office*
3301 C Street, Suite 740, Sacramento, CA 95816
Phone: (916) 323-0766
ELuc@sco.ca.gov

Jill Magee, Program Analyst, *Commission on State Mandates*
980 9th Street, Suite 300, Sacramento, CA 95814
Phone: (916) 323-3562
Jill.Magee@csm.ca.gov

Darryl Mar, Manager, *State Controller's Office*
3301 C Street, Suite 740, Sacramento, CA 95816
Phone: (916) 323-0706
DMar@sco.ca.gov

Tim McDermott, Director of Finance, *City of Poway*
13325 Civic Center Drive, Poway, CA 92064
Phone: (858) 668-4411
tmcdermott@poway.org

Tina McKendell, *County of Los Angeles*
Auditor-Controller's Office, 500 West Temple Street, Room 603, Los Angeles, CA 90012
Phone: (213) 974-0324
tmckendell@auditor.lacounty.gov

Michelle Mendoza, *MAXIMUS*
17310 Red Hill Avenue, Suite 340, Irvine, CA 95403

Phone: (949) 440-0845
michellemendoza@maximus.com

Monica Molina, Finance Manager/Treasurer, *City of Del Mar*
Claimant Contact
1050 Camino Del Mar, Del Mar, CA 92014
Phone: (858) 755-9354
mmolina@delmar.ca.us

Jill Moya, Financial Services Director, *City of Oceanside*
300 North Coast Highway, Oceanside, CA 92054
Phone: (760) 435-3887
jmoya@oceansideca.org

Marilyn Munoz, Senior Staff Counsel, *Department of Finance*
915 L Street, Sacramento, CA 95814
Phone: (916) 445-8918
Marilyn.Munoz@dof.ca.gov

Tim Nash, Director of Finance, *City of Encinitas*
Claimant Contact
505 S Vulcan Avenue, Encinitas, CA 92054
Phone: N/A
finmail@encinitasca.gov

Kaleb Neufeld, Assistant Controller, *City of Fresno*
2600 Fresno Street, Fresno, CA 93721
Phone: (559) 621-2489
Kaleb.Neufeld@fresno.gov

Andy Nichols, *Nichols Consulting*
1857 44th Street, Sacramento, CA 95819
Phone: (916) 455-3939
andy@nichols-consulting.com

Dale Nielsen, Director of Finance/Treasurer, *City of Vista*
Claimant Contact
Finance Department, 200 Civic Center Drive, Vista, CA 92084
Phone: (760) 726-1340
dnielsen@ci.vista.ca.us

Adriana Nunez, Staff Counsel, *State Water Resources Control Board*
Los Angeles Regional Water Quality Control Board, 1001 I Street, 22nd Floor, Sacramento, CA 95814
Phone: (916) 322-3313
Adriana.Nunez@waterboards.ca.gov

Eric Oppenheimer, Executive Director, *State Water Resources Control Board*
1001 I Street, 22nd Floor, Sacramento, CA 95814-2828
Phone: (916) 341-5615
eric.oppenheimer@waterboards.ca.gov

Frederick Ortlieb, Senior Deputy City Attorney, *City of San Diego*
1200 Third Avenue, 11th Floor, San Diego, CA 92101
Phone: (619) 236-6318
fortlieb@sandiego.gov

Patricia Pacot, Accountant Auditor I, *County of Colusa*
Office of Auditor-Controller, 546 Jay Street, Suite #202 , Colusa, CA 95932
Phone: (530) 458-0424
ppacot@countyofcolusa.org

Arthur Palkowitz, *Law Offices of Arthur M. Palkowitz*
12807 Calle de la Siena, San Diego, CA 92130
Phone: (858) 259-1055
law@artpalk.onmicrosoft.com

Kirsten Pangilinan, Specialist, *State Controller's Office*
Local Reimbursements Section, 3301 C Street, Suite 740, Sacramento, CA 95816
Phone: (916) 322-2446
KPangilinan@sco.ca.gov

Helen Holmes Peak, *Lounsbery Ferguson Altona & Peak, LLP*
960 Canterbury Place, Ste. 300, Escondido, CA 92025
Phone: (760) 743-1201
hhp@lfap.com

Brian Pierik, *Burke,Williams & Sorensen,LLP*
2310 East Ponderosa Drive, Suite 25, Camarillo, CA 93010-4747
Phone: (805) 987-3468
bpierik@bwslaw.com

Johnnie Pina, Legislative Policy Analyst, *League of Cities*
1400 K Street, Suite 400, Sacramento, CA 95814
Phone: (916) 658-8214
jpina@cacities.org

Jai Prasad, *County of San Bernardino*
Office of Auditor-Controller, 222 West Hospitality Lane, 4th Floor, San Bernardino, CA 92415-0018
Phone: (909) 386-8854
jai.prasad@sbcountyatc.gov

Jonathan Quan, Associate Accountant, *County of San Diego*
Projects, Revenue, and Grants Accounting, 5530 Overland Ave, Suite 410, San Diego, CA 92123
Phone: 6198768518
Jonathan.Quan@sdcounty.ca.gov

Roberta Raper, Director of Finance, *City of West Sacramento*
1110 West Capitol Ave, West Sacramento, CA 95691
Phone: (916) 617-4509
robertar@cityofwestsacramento.org

David Rice, *State Water Resources Control Board*
1001 I Street, 22nd Floor, Sacramento, CA 95814
Phone: (916) 341-5161
david.rice@waterboards.ca.gov

Marco Rodriguez, Accounting Analyst, *City of Lemon Grove*
3232 Main Street, Lemon Grove, CA 91945
Phone: (619) 825-3822
mrodriguez@lemongrove.ca.gov

Lydia Romero, City Manager, *City of Lemon Grove*
Claimant Contact
3232 Main Street, Lemon Grove, CA 91945
Phone: (619) 825-3819
lromero@lemongrove.ca.gov

Tammi Royales, Director of Finance, *City of La Mesa*
Claimant Contact
8130 Allison Avenue, PO Box 937, La Mesa, CA 91944-0937
Phone: (619) 463-6611
findir@cityoflamesa.us

Jessica Sankus, Senior Legislative Analyst, *California State Association of Counties (CSAC)*
Government Finance and Administration, 1100 K Street, Suite 101, Sacramento, CA 95814
Phone: (916) 327-7500
jsankus@counties.org

Alex Sauerwein, Attorney, *State Water Resources Control Board*
San Diego Regional Water Quality Control Board, 1001 I Street, 22nd Floor, Sacramento, CA 95814
Phone: (916) 327-8581
Alex.Sauerwein@waterboards.ca.gov

Cindy Sconce, Director, *Government Consulting Partners*
5016 Brower Court, Granite Bay, CA 95746
Phone: (916) 276-8807
cindysconcegcp@gmail.com

Carla Shelton, Senior Legal Analyst, *Commission on State Mandates*
980 9th Street, Suite 300, Sacramento, CA 95814
Phone: (916) 323-3562
carla.shelton@csm.ca.gov

Camille Shelton, Chief Legal Counsel, *Commission on State Mandates*
980 9th Street, Suite 300, Sacramento, CA 95814
Phone: (916) 323-3562
camille.shelton@csm.ca.gov

Wayne Shimabukuro, *County of San Bernardino*
Auditor/Controller-Recorder-Treasurer-Tax Collector, 222 West Hospitality Lane, 4th Floor, San Bernardino, CA 92415-0018
Phone: (909) 386-8850
wayne.shimabukuro@atc.sbcounty.gov

Natalie Sidarous, Chief, *State Controller's Office*
Local Government Programs and Services Division, 3301 C Street, Suite 740, Sacramento, CA 95816
Phone: 916-445-8717
NSidarous@sco.ca.gov

Paul Steenhausen, Principal Fiscal and Policy Analyst, *Legislative Analyst's Office*
925 L Street, Suite 1000, , Sacramento, CA 95814
Phone: (916) 319-8303
Paul.Steenhausen@lao.ca.gov

Julie Testa, Vice Mayor, *City of Pleasanton*
123 Main Street PO Box520, Pleasanton, CA 94566
Phone: (925) 872-6517
Jtesta@cityofpleasantonca.gov

Jolene Tollenaar, *MGT Consulting Group*
2251 Harvard Street, Suite 134, Sacramento, CA 95815
Phone: (916) 243-8913
jolenetollenaar@gmail.com

Brian Uhler, Principal Fiscal & Policy Analyst, *Legislative Analyst's Office*
925 L Street, Suite 1000, Sacramento, CA 95814

Phone: (916) 319-8328
Brian.Uhler@LAO.CA.GOV

Matthew Vespi, Chief Financial Officer, *City of San Diego*
202 C Street, 9th Floor, San Diego, CA 92101
Phone: (619) 236-6218
mvespi@sandiego.gov

Emel Wadhwani, Senior Staff Counsel, *State Water Resources Control Board*
Office of Chief Counsel, 1001 I Street, Sacramento, CA 95814
Phone: (916) 322-3622
emel.wadhwani@waterboards.ca.gov

Ada Waelder, Legislative Analyst, Government Finance and Administration, *California State Association of Counties (CSAC)*
1100 K Street, Suite 101, Sacramento, CA 95814
Phone: (916) 327-7500
awaelder@counties.org

Renee Wellhouse, *David Wellhouse & Associates, Inc.*
3609 Bradshaw Road, H-382, Sacramento, CA 95927
Phone: (916) 797-4883
dwa-renee@surewest.net

Adam Whelen, Director of Public Works, *City of Anderson*
1887 Howard St., Anderson, CA 96007
Phone: (530) 378-6640
awhelen@ci.anderson.ca.us

Colleen Winchester, Senior Deputy City Attorney, *City of San Jose*
200 East Santa Clara Street, 16th Floor, San Jose, CA 95113
Phone: (408) 535-1987
Colleen.Winchester@sanjoseca.gov

R. Matthew Wise, Supervising Deputy Attorney General, *Department of Justice*
Attorney General's Office, 1300 I Street, Suite 125, PO Box 944255, Sacramento, CA 94244-2550
Phone: (916) 210-6046
Matthew.Wise@doj.ca.gov

Yuri Won, Attorney, Office of Chief Counsel, *State Water Resources Control Board*
San Francisco Bay Regional Water Quality Control Board, 1001 I Street, 22nd Floor, Sacramento, CA 95814
Phone: (916) 327-4439
Yuri.Won@waterboards.ca.gov

Jacqueline Wong-Hernandez, Deputy Executive Director for Legislative Affairs, *California State Association of Counties (CSAC)*
1100 K Street, Sacramento, CA 95814
Phone: (916) 650-8104
jwong-hernandez@counties.org

Elisa Wynne, Staff Director, *Senate Budget & Fiscal Review Committee*
California State Senate, State Capitol Room 5019, Sacramento, CA 95814
Phone: (916) 651-4103
elisa.wynne@sen.ca.gov

Kaily Yap, Budget Analyst, *Department of Finance*
Local Government Unit, 915 L Street, Sacramento, CA 95814
Phone: (916) 445-3274
Kaily.Yap@dof.ca.gov

Helmholst Zinser-Watkins, Associate Governmental Program Analyst, *State Controller's Office*
Local Government Programs and Services Division, Bureau of Payments, 3301 C Street, Suite 700, Sacramento, CA 95816
Phone: (916) 324-7876
HZinser-watkins@sco.ca.gov