# 1.0 INTRODUCTION

The cities of Anaheim, Brea, Buena Park, Costa Mesa, Cypress, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, Irvine, La Habra, La Palma, Laguna Hills, Laguna Woods, Lake Forest, Los Alamitos, Newport Beach, Orange, Placentia, Santa Ana, Seal Beach, Stanton, Tustin, Villa Park, Westminster, and Yorba Linda (collectively the Santa Ana Region Permittees) and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively the San Diego Region Permittees) operate municipal storm drain systems and discharge stormwater and urban runoff pursuant to National Pollutant Discharge Elimination System (NPDES) Permits.

These Permits require that the Permittees work together to:

- Effectively prohibit non-stormwater discharges to the stormdrain system, and
- Implement controls to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable (MEP).

The Permits were first adopted in 1990 and subsequently renewed in 1996 (Second Term) and 2002 (Third Term) (See **Table 1.1**). This **Report of Waste Discharge** has been prepared in anticipation of the expiration of the Third Term Permits in early 2007 and comprises:

- An evaluation of NPDES permit compliance over the period of the Third Term Permits;
- A proposed management program, the **2007 Drainage Area Management Plan (2007 DAMP)** (see **Appendix A**) for the Fourth Term Permits;
- A comparison of land use in Orange County in 2002 and 2005 (see **Appendix B**), and,
- A compendium of maps showing changes to the storm drain system infrastructure over the period of the Third Term Permits (see **Appendix C**).

## 1.1 Background

### 1.1.1 Drainage Area Management Plan

The **Drainage Area Management Plan (DAMP)** is the principal policy and program guidance document for the *Orange County Stormwater Program*, a cooperative municipal regulatory compliance initiative focused on the management and protection of Orange County's streams, rivers, creeks and coastal waters. The main objective of the DAMP is to fulfill the commitment of the Permittees to develop and implement a program that satisfies NPDES permit requirements.

The DAMP describes the agreements, structures and programs that:

- Provide the framework for the program management activities and plan development (**DAMP Section 2.0** and **Section 3.0**);

- Provide the legal authority for prohibiting unpermitted discharges into the storm drain system and for requiring BMPs in new development and significant redevelopment (**DAMP Section 4.0**);

- Improve existing municipal pollution prevention and removal best management practices (BMPs) to further reduce the amount of pollutants entering the storm drain system. (**DAMP Section 5.0**);

- Educate the public about the issues of urban stormwater and non-stormwater pollution and obtain their support in implementing pollution prevention BMPs (**DAMP Section 6.0**);

- Ensure that all new development and significant redevelopment incorporates appropriate Site Design, Source Control and Treatment Control BMPs to address specific water quality issues. (**DAMP Section 7.0**);

- Ensure that construction sites implement control practices that address control of construction related pollutants discharges including an effective combination of erosion and sediment controls and on-site hazardous materials and waste management (**DAMP Section 8.0**);

- Ensure that existing development addresses discharges from industrial facilities, selected commercial businesses, residential development and common interest areas/homeowner associations (note: the San Diego permit explicitly outlines a residential component, but the Santa Ana permit is more general about residential requirements). (**DAMP Section 9.0**);

- Detect and eliminate illegal discharges/illicit connections to the municipal storm drain system (**DAMP Section 10.0**);

- Identify urban impacts on receiving waters; produce environmental quality information to direct management activities, including prioritization of pollutants to support the development of specific controls to address these problems; and determine pollutant load reductions and changes in the quality of receiving waters (**DAMP Section 11.0**); and

- Assess watershed constituents of concern and manage urban runoff on a watershed basis (**DAMP Section 12.0**).

### 1.1.2 Runoff from Urban Areas

The Program is concerned with the imprint of urban development on the landscape.

Urbanization creates rooftops, driveways, roads and parking lots (Schueler and Holland, 2000,[1] use the term *Imperviousness* as the unifying theme for understanding the adverse hydrologic impacts of urbanization), which (1) increase the timing and volume of rainfall runoff (compared to pre-development conditions) and (2) provide a source of pollutants that are flushed or leached by rainfall runoff into aquatic systems. The environmental consequences of these impacts are loss or impairment of aquatic beneficial uses due to:

- Water quality degradation resulting from increased loadings of sediment nutrients, metals hydrocarbons, pesticides and bacteria;
- Stream channel instability and habitat loss resulting from increased severity and frequency of floods;
- Increased water temperatures resulting from solar energy absorption by urban surfaces and elimination of riparian shading; and
- Loss of groundwater recharge.

### 1.1.3 Regulatory History

The Orange County Stormwater Program was initiated in 1990 as a cooperative local government response to a 1987 amendment to the federal Clean Water Act (CWA). This amendment extended the provisions of CWA Section 402 (National Pollutant Discharge Eliminations System permitting) to municipal storm drain system operators thereby making local governments (and some industrial activities) responsible for the quality of their stormwater discharges. Permit application requirements were promulgated by US Environmental Protection Agency (EPA) in 1990 (40 CFR 122) and form the basis of the current program.

Orange County's first NPDES Permits were issued in 1990 with renewals in 1996 and 2002. There are separate NPDES Permits administered by the Santa Ana and San Diego Regional Water Quality Control Boards (RWQCBs). The Permits prescribe that surface water quality protection be addressed in local governments' oversight of construction and development, its regulation of industry and commerce, and in its construction, operation and maintenance of the public urban infrastructure.

Program managers maintain the compliance of their jurisdiction with the applicable permit (or permits) through implementation of a BMP-based environmental management system (i.e. the DAMP) that is subject to both annual self auditing and reporting and external regulatory compliance audits which, in the Santa Ana Regional Board are, is an enforceable part of the Third Term Permit.

[1] Thomas R. Schuler and Heather K. Holland. *The Practice of Watershed Protection: Techniques for protecting our nation's streams, lakes, rivers and estuaries* (Maryland: Center for Watershed Protection, 2000).

## 1.2 Approach to Preparing Report of Waste Discharge

### 1.2.1 Themes

The immediate objective of the ROWD is to fulfill the commitment of the Permittees to undertake a program assessment and propose revisions to the management program in response to the information learned. While compliance with the Third Term Permits is maintained by implementation of prescribed management actions, program assessment must be undertaken with regard to the Permits' receiving water limitations provisions which require adaptation of the Orange County Stormwater Program where urban sources are causing or contributing to exceedances of applicable water quality standards. The first of the major themes that has framed preparation of the ROWD is a focusing of management efforts on identified water quality constituents of concern identified by the environmental monitoring programs.

The Third Term Permits transformed the Orange County Stormwater Program developed under the First and Second Permit Terms. The major escalation in compliance obligations prescribed new requirements for local governments' oversight of construction and development, regulation of industry and commerce, and its construction, operation and maintenance of the public urban infrastructure. These new compliance obligations required a major realignment of the program implemented over two years with the consequence that program performance metrics are generally available for three years. Program effectiveness assessments over the limited period of full implementation have indicated positive programmatic impacts, as detailed in subsequent sections of this report. However, annual assessments have also indicated significant variability in performance reporting between jurisdictions. In addition, regulatory agency reviews have identified differences in regulatory agency and Permittee expectations in key areas of the Program, particularly with respect to regulation and oversight. The second major theme of the ROWD is therefore a focus on enhancing existing program implementation rather than the proposed development of major new program initiatives.

The third major theme is a focus on the watershed approach and specific water quality constituents of concern. The Third Term Permits required the Permittees under the jurisdiction of the San Diego RWQCB to develop Watershed Urban Runoff Management Plans (WURMPs) to address priority water quality constituents of concern, and similar plans are being developed for watersheds in the Santa Ana Region. The WURMPs, termed DAMP Watershed Action Plans, while continuing to evolve, provide a basis for both cooperative targeted actions that complement the countywide approach and optimizing management actions on a regional, sub-regional or jurisdictional basis.

**Major Themes of the ROWD**

- Demonstrating the Iterative Management Approach: Implementing policy shifts based upon the findings of the environmental monitoring programs.

- Enhancing Implementation: Focusing on program implementation through incorporation of environmental management system concepts.

- Emphasizing the Watershed Approach: Establishing and enhancing watershed–based water quality planning on a countywide basis.

1.2.2 Assessment

The DAMP incorporates three separate but nonetheless related water quality planning processes which are identified as "countywide," "jurisdictional," and "watershed-based" water quality management. Each process is iterative and incorporates annual phases of assessment focused on determining whether programmatic outcomes are being achieved (See **DAMP Appendix C – Program Effectiveness Assessment**). These annual assessments have previously been reported (see Unified and jurisdictional Annual Progress Reports).

**DAMP Appendix C** also recognizes the additional phase of assessment required in the ROWD every five years. While the longer term perspective of the ROWD allows a focus on environmental outcomes, both the annual and ROWD assessments necessarily consider the same performance metrics, both programmatic and environmental. In addition to considering these metrics, preparation of effectiveness assessments in the ROWD were additionally informed by:

- A longer term (rather than annual) review of the findings of the countywide water quality monitoring programs;

- Review of audit reports and other regulatory correspondence regarding the Program and meetings with RWQCB staff;

- A series of facilitated consultation meetings with jurisdictional program coordinators, including in-depth interviews on key program areas; and

- Input from the public at workshops.

**The assessment has produced two types of programmatic recommendations:**

1. ROWD Commitments, and
2. DAMP Modifications.

ROWD commitments represent shifts in programs that will be implemented upon completion of a development process with the Permittees, and are identified at the end of each program section of the ROWD. DAMP Modifications are characterized as programmatic modifications for improving program implementation and have been incorporated into the proposed 2007 DAMP.

*Program Effectiveness*

An activity, program element, or overall program is effective if it is producing a desired outcome. **Figure 1.1** shows that outcomes can be construed in terms of six levels and illustrates the progression of each successive level toward the ultimate goal of environmental improvement. In general, Levels 1 to 3 can be considered *Implementation Outcomes*, Levels 5 and 6 *Water Quality Outcomes* and Level 4 a combination of the two. Each level has value in informing the management process. However, it bears emphasis that not all are necessary or possible in every instance (CASQA, 2005).[2]
Assessment measures may be variously categorized. In this ROWD, two categories are recognized, related to (1) the shorter term confirmation of BMP implementation (Implementation or Process Measures, also termed Programmatic Indicators), corresponding to Levels 1-3 in **Figure 1.1**, and (2) the longer term verification of environmental improvement (Validation or Results Measures, typically actual indicators of environmental change). In essence, the categorization of measures reflects two basic assessment questions:

- Are program elements being implemented correctly?
- Are environmental improvements being realized?

**Headline Indicators** are intended to be a sub-set of measures that reflect in simple terms how a stormwater program is progressing towards its goals and are easily understandable. The Orange County Stormwater Program Headline Indicators that have been reported over the Third Term Permits are presented in **Table 1.2**.

Effectiveness assessment requires the establishment of a set of baseline conditions. Thereafter effectiveness can be determined by comparisons of successive years of indicator information against the baseline data. Where the period of evaluation is characterized by the implementation of new program requirements, determinations of program effectiveness will be limited to confirmation of program implementation. Indeed, it must be recognized that evidence of positive environmental outcomes can be elusive because:

- Water quality changes in response to program implementation are likely to be very slow; and
- Establishing a link between receiving water condition and program activities is difficult at the watershed scale when programs are being implemented incrementally.

While program effectiveness assessment is a key step in the iterative process of program

[2] California Stormwater Quality Association (CASQA). 2005. "An Introduction to Stormwater Program Effectiveness Assessment." Available at: http://www.scvurppp-w2k.com/pdfs/0405/CASQA%20White%20Paper_An%20Introduction%20to%20Stormwater%20Program%20Effectiveness%20Assessment4.pdf.

implementation, it should be realized that effectiveness assessment tools are still evolving. Assessing program effectiveness is recognized as a challenge for program managers across California, and the Orange County Stormwater Program is supporting the effort of the California Stormwater Quality Association (CASQA) to develop guidance in this area at a statewide level.

*Environmental Assessment*

A summary of the major findings of the water quality monitoring program is presented in **Section 11**. This summary has identified a number of water quality constituents of concern, specifically, metals (copper and zinc) and pesticides, based upon frequent exceedances of water quality standards and the occurrence of toxicity, respectively. In addition, Total Maximum Daily Loads (TMDL) and 13225 and 13267 Directives (see **Section 12**) for pathogen indicator bacteria and regulatory interventions regarding trash and debris require that these constituents also be considered water quality constituents of concern that will be the focus of targeted management efforts over the period of the Fourth Term Permits.

*Regulatory Assessment*

Over the period of the Third Term Permits, most of the municipal entities have been the subject of compliance audits which have served to highlight the successes (national recognition by USEPA) and shortcomings (three instances of administrative civil liabilities) of the Program. Since the primary objective of the DAMP is to fulfill the commitment of the Permittees to develop and implement a program that satisfies NPDES permit requirements, regulatory agency findings regarding permit compliance and the performance of the Orange County Stormwater Program must be considered in effectiveness assessments. Indeed, many of the commitments made in the subsequent sections follow from regulatory findings. In addition, current Total Maximum Daily Load (TMDL) development in the South County area and a regulatory intervention regarding trash and debris in the north County area, elevate fecal indicator bacteria and trash and debris to the status of Orange County Stormwater Program water quality constituents of concern.

*Permittee Assessment*

The Permittees have undertaken a comprehensive review of the current programs, identifying areas that are ineffective and require modification, and ones requiring additional emphasis. This assessment, coupled with the environmental and regulatory assessments, are the foundational underpinnings for this ROWD.

**Table 1.1: Permit History**

| Permit Term | Santa Ana Regional Board | | | San Diego Regional Board | | |
|---|---|---|---|---|---|---|
| | Order No. | NPDES No. | Date Adopted | Order No. | NPDES No. | Date Adopted |
| First (1990-1996) | 90-71 | CA 8000180 | July 1990 | 90-38 | CA 0108740 | July 1990 |
| Second (1996-2002) | 96-31 | CAS618030 | March 1996 | 96-03 | CAS0108740 | August 1996 |
| Third (2002-2007) | R8-2002-0010 | CAS618030 | January 2002 | R9-2002-0001 | CAS0108740 | February 2002 |

**Table 1.2: Headline Measures**

| Program Element | Headline Measure | Process Measure | Result Measure | |
|---|---|---|---|---|
| | | | Indirect | Direct |
| 2.0 Program Management | Participation in General Permittee Committee | X | | |
| 5.0 Municipal Activities | Solid Waste Collected | | X | |
| | Drainage Facility Maintenance - Solid Waste Collected | | X | |
| | Catchbasin Stenciling | X | | |
| | Street Sweeping - Solid Waste Collected | | X | |
| | Household Hazardous Waste Collected | | X | |
| | Used Oil Collected | | X | |
| | # of Facilities Inspected | X | | |
| | Prioritization (High, Medium, Low) of Facilities | | X | |
| | Reduction in Total Pesticide Application | | X | |
| | Reduction in Total Fertilizer (Nitrogen) Application | | X | |
| | Reduction in Total Fertilizer (Phosphorus) Application | | X | |
| 6.0 Public Education | # of Impressions | X | | |
| | Changes in Public Awareness and Behavior | | X | |

**Table 1.2: Headline Measures**

| Program Element | Headline Measure | Process Measure | Result Measure | |
|---|---|---|---|---|
| | | | Indirect | Direct |
| 7.0 New Development | # of WQMPs processed | X | | |
| | Area (Acreage) to which BMPs have been Applied | | X | |
| | # of BMPs Implemented | | X | |
| 8.0 Construction | # of Sites Inspected | X | | |
| | Extent of Compliance | | X | |
| | # and Level of Enforcement Actions | X | | |
| 9.0 Existing Development | # of BMPs Implemented | | X | |
| | Prioritization of Facilities | | X | |
| | # and Level of Enforcement Actions | X | | |
| 10.0 ID/IC | # of Complaints | | X | |
| | # and Level of Enforcement Actions | X | | |
| 11.0 Water Quality | Monitoring | | | X |

**Figure 1.1: General Classification of Outcome Types**