

**Report of Waste Discharge**

Signed Certified Statement

Executive Summary

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## EXECUTIVE SUMMARY

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The Orange County Stormwater Program (the Program) is a cooperative municipal regulatory compliance initiative focused on the management of urban and stormwater runoff for the protection and enhancement of Orange County's creeks, rivers, streams, and coastal waters. The main objective of the Program is to fulfill the commitment of Orange County's cities, the County of Orange and the Orange County Flood Control District to develop and implement a program that satisfies the requirements of area-wide municipal National Pollutant Discharge Elimination System (NPDES) permits (subsequently referred to as the Third Term Permits).

The purpose of this document is to comply with the requirement of the Third Term Permits, Regional Water Quality Control Board Orders R8-2002-0010 (Santa Ana Regional Board) and R9-2002-0001 (San Diego Regional Board) to submit a Report of Waste Discharge 180 days prior to permit expiration. This Report discusses the Permittees' Third Term Permit compliance activities and includes a description of accomplishments, an assessment of program effectiveness, and a proposed management program (a draft 2007 Drainage Area Management Plan) for the period 2007-2012.

The Program's accomplishments represent the culmination of the development and three years of implementation of a program that was substantially revised to meet the requirements of the Third Term NPDES Permits. Notable programmatic accomplishments include:

- Completion of the 2003 DAMP including 34 jurisdictional Local Implementation Plans (LIPs) (**DAMP Appendix A**), a formal training program (**DAMP Appendix B**) a program effectiveness assessment strategy (**DAMP Appendix C**), and 6 Watershed Action Plans (WAPs) (**DAMP Appendix D**) (**Section 2.0**);
- Establishment of 2 separate, but nonetheless similar and highly interdependent, planning processes targeting the control of pollutants in urban runoff and completion of studies to evaluate the effectiveness and applicability of various source control and treatment control Best Management Practices (**DAMP Appendix D**) (**Section 3.0**);
- Validation, through independent administrative and trial court review, of the robustness of the Permittees' local legal authority for DAMP implementation (**Section 4.0**);
- Development and implementation of (1) a Model Municipal Activities program at 2,302 municipal facilities, (2) Model Integrated Pest Management Guidelines which have reduced municipal fertilizer and pesticide use, and (3) an Established BMP performance reporting program that has indicated the increased effectiveness of street sweeping and trash and debris collection practices (**Section 5.0**);
- Development and implementation of a public education program that has created over 160,000,000 media impressions and produced measurable and positive changes in public awareness and behavior (**Section 6.0**);
- Development and implementation of a Model Water Quality Management Plan (WQMP) based program for new development, the approval of over 1,400 project WQMPs, and the creation and ongoing development of a web-based expert system to support coastal urban wetland management (**Section 7.0**);
- Development and implementation of a Model Construction Program under which 6,570 enforcement actions were taken within a pattern of increasing levels of compliance in the most recent annual reporting period (**Section 8.0**);
- Development and implementation of a Model Industrial/Commercial Program under which over 31,000 facilities have been subject to local regulatory review and 7,266

enforcement actions were taken within a pattern of increasing levels of compliance in the most recent annual reporting period (**Section 9.0**);

- The investigation of 8,866 complaints regarding illegal discharges or illicit connections, increased use of a telephone hotline for the reporting by the public of water quality concerns, and implementation of enhanced cooperative local agency procedures and practices for sewage spill response (**Section 10.0**);
- Development and approval of the Third Term Permit water quality monitoring program and development and implementation of a sophisticated environmental data management system (Labtrack) (**Section C-11.0**), and
- Implementation of the DAMP/Watershed Action Plans (WAPs) in the San Diego Regional Board area (**Section C-12.0**) and significant progress toward completion of WAPs for the Newport Bay and Santa Ana River watersheds.

In assessing the effectiveness of the Program, the Permittees evaluated a series of performance metrics termed Headline Measure, that are intended to confirm program implementation and validate achievement of outcomes. The basis of this approach draws on the hierarchical taxonomy of programmatic outcomes, being advocated by the California Stormwater Quality Association (CASQA), which creates a framework for defining the relationships between compliance actions and, ultimately, positive changes in water quality. In addition, the assessment has been informed by (1) the findings of the Countywide water quality monitoring programs, (2) a series of consultative workshops conducted with jurisdictional program coordinators, (3) reviews of audit reports and other Regional Water Quality Control Board (RWQCB) correspondence and meetings with RWQCB staff, and (4) the receiving water limitations provisions of the Permits.

In conducting the assessment, three major themes emerged during the review. These themes are:

Theme 1: Demonstrating the iterative management approach: Adapting the management program to more effectively address urban sources of pollutants that are causing or contributing to exceedances of water quality standards;

Theme 2: Enhancing Implementation: Improving program implementation through incorporation for auditable environmental management system concepts, and

Theme 3: Establishing watershed-based water quality planning: On a Countywide basis, creating 2 separate, but nonetheless highly inter-related, water quality planning processes, to address urban sources of pollutants.

The Program effectiveness assessment resulted in 2 types of programmatic recommendations, specifically (1) ROWD Commitments (New programmatic commitments to be developed and implemented over the period of the Fourth Term Permits) and (2) DAMP Modifications (Improvements to existing program commitments incorporated into the proposed 2007 DAMP). The ROWD Commitments comprise:

Iterative Management: Developing and implementing new BMP programs including Integrated Pest Management (IPM) approaches for pesticide toxicity, BMPs for the architectural use of copper and zinc in new development, and new BMPs and for municipal trash and debris

## EXECUTIVE SUMMARY

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control.

Enhancing implementation: Defining the expertise and competencies of staff with program implementation responsibilities and to develop staff skills and expertise through a strategic approach to training. Also, commitments to develop program guidance documentation and standards for source and treatment control BMPs.

Enhancing watershed-based water quality planning: Completing 11 Watershed Action Plans to establish countywide and watershed-based water quality planning processes across Orange County.

## 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.

## SECTION 1.0, INTRODUCTION

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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.

## SECTION 1.0, INTRODUCTION

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Urbanization creates rooftops, driveways, roads and parking lots (Schueler and Holland, 2000,<sup>1</sup> 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.

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<sup>1</sup> 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).<sup>2</sup>

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

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<sup>2</sup> 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](http://www.scvurppp-w2k.com/pdfs/0405/CASQA%20White%20Paper_An%20Introduction%20to%20Stormwater%20Program%20Effectiveness%20Assessment4.pdf).

## SECTION 1.0, INTRODUCTION

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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

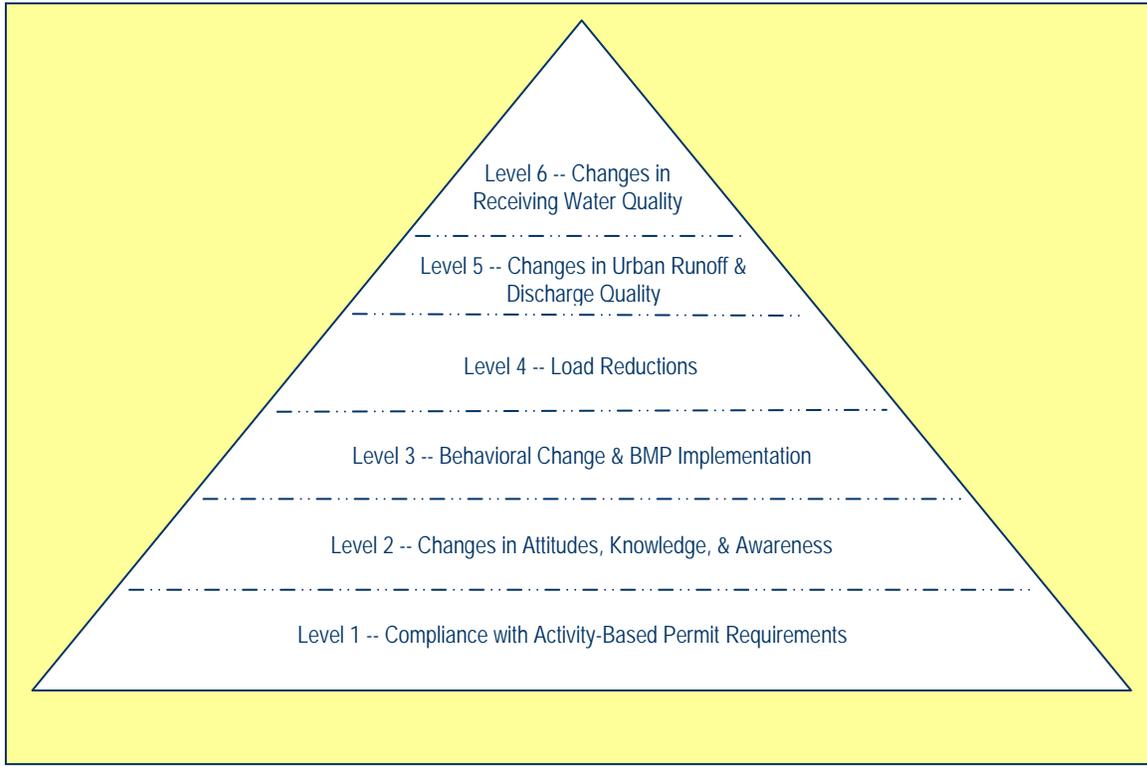
Table 1.2: Headline Measures

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**



### 2.0 PROGRAM MANAGEMENT

#### 2.1 Introduction

The key elements of program management comprise the Principal Permittee and Permittee relationship, the Implementation Agreement, the structure and hierarchy of committees (termed Management Framework), and policy and program documentation (i.e. the DAMP). At the inception of the Orange County Stormwater Program, the Permittees in both Regional Board areas agreed that the County of Orange would be the Principal Permittee and the cities and the Orange County Flood Control District would be Co-Permittees on the permit (all parties are now collectively referred to as Permittees). Principal Permittee and Permittee responsibilities are specified in the Permits and reiterated in the NPDES Stormwater Permit Implementation Agreement (referred to as Implementation Agreement) which also provides a funding mechanism for the shared costs (administration, program development, public education, and environmental monitoring) of the Orange County Stormwater Program. To further support the development and implementation of a coordinated countywide program, a management framework was created during the First Permit Term. With the Third Term Permits this framework has evolved into a four tier structure (Permittees, City Managers' Water Quality Committee, Technical Advisory Committee (TAC) and Program Committees/Task Forces). Concurrently, the DAMP was substantially revised to address the significant escalation in compliance requirements prescribed in the Third Term Permits.

#### 2.2 Accomplishments

##### 2.2.1 Implementation Agreement

The Implementation Agreement, originally entered into in December of 1990, was amended in October of 1993 to include two additional Permittees (Laguna Hills and Lake Forest) and formally establish the TAC.

- Implementation Agreement: On June 25, 2002, the Implementation Agreement was amended again and fully restated to include three additional Permittees (Aliso Viejo, Laguna Woods and Rancho Santa Margarita).

##### 2.2.2 Management Framework

The Permittees established (in early 2002) and maintained a tiered management framework consisting of committees, task forces, sub-committees and ad hoc work groups to direct the development and implementation of the Orange County Stormwater Program (**Figure 2.1**). A greater level of participation in all aspects of the program has been evident by high Permittee participation in the management framework. This framework is composed of:

- City Manager's Water Quality Committee
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## SECTION 2.0, PROGRAM MANAGEMENT

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The City Manager's Water Quality Committee meets as needed to provide budget and overall program review and governance direction.

- City Engineer's Technical Advisory Committee (TAC)

The TAC serves in a program advisory role and provides policy direction on program budget and program development and implementation. It is comprised of one Public Works Director/City Engineer, or selected representative, from each of the County Supervisor Districts and a representative from the County of Orange. It meets 4-6 times annually.

- General Permittee Committee

The General Permittee Committee is the principal forum for disseminating information for program coordinators. The Committee meets monthly (except November).

In 2004-05, thirty four (34) out of thirty five (35) Permittees reported 80% or higher participation in the General Permittee Committee.

- Task Forces/ Sub-Committees

The *Task Forces/ Sub-Committees* provide for the continued development of the program in a specified area of program responsibility and oversight. The Task Forces/ Sub-Committees which were active in 2004-05, are:

- Trash and Debris Task Force
    - Purpose: To foster and sustain partnership approaches to dealing with trash and debris in stormwater and urban runoff (quarterly meeting schedule). Recent products include a strategic assessment of Orange County's trash and debris control efforts.
  - Legal/Regulatory Authority Task Force
    - Purpose: To review the legal authorities that the Permittees have in complying with the permit requirements and recommend changes as needed and to track stormwater related litigation that may affect the Orange County Stormwater Program (quarterly meeting schedule).
  - Water Use Efficiency Task force
    - Purpose: To study and support a comprehensive effort to curb urban runoff through efficient water usage in Orange County (quarterly meeting schedule).
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## SECTION 2.0, PROGRAM MANAGEMENT

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- Data and Information Management Sub-Committee
    - Purpose: To oversee the development and implementation of information technology solutions to program data management and reporting requirements (monthly meeting schedule). Recent products include an internet-based system for preparation of the annual reports/Program Effectiveness Assessments (PEAs).
  - LIP/PEA Sub-Committee
    - Purpose: To provide oversight and technical direction to the management of core DAMP/Local Implementation Plan (LIP) programs (bi-monthly meeting schedule).
  - Public Education Sub-Committee
    - Purpose: To provide regional consistency and oversight for the stormwater public education program efforts (monthly meeting schedule). The sub-committee directs development and dissemination of all education and outreach materials.
  - Inspection Sub-Committee
    - Purpose: To provide a forum for the coordination, investigation, enforcement and training aspects of the existing development inspection program and Illegal Discharges/Illicit Connections (ID/IC) programs (bi-monthly meeting schedule). Recent products include the Investigative Guidance Manual and self-audit checklist.
  - Water Quality Sub-Committee
    - Purpose: To provide oversight and technical input for the revision of the water quality monitoring programs, ongoing water quality data evaluation, and special water quality investigations and BMP effectiveness studies (quarterly meeting schedule).
  - Ad-Hoc Group – Wastewater Disposal
    - Purpose: To develop a list of BMPs for the disposal of washwater/wastewater generated by mobile businesses. The Group was convened specifically to address wastewater disposal issues and worked cooperatively with the sewerage agencies to produce best management practice guidance (BMP Fact Sheet IC24). This ad-hoc group has now sunsetted.
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## SECTION 2.0, PROGRAM MANAGEMENT

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- Watershed Committees
  - Seven Watershed Committees (Newport Bay, Laguna Coastal streams, Aliso Creek, Dana Point Coastal Streams, San Juan Creek, San Clemente Coastal Streams, and San Mateo Creek) were established and have met regularly since their inception.
  - Other Watershed Committees/Work Groups

The Permittees have also participated in the Newport Bay Executive and Management Committees (the latter held jointly for a period with the Army Corp of Engineers (ACOE) Study Management Team), the Huntington Harbour Water Quality Task Force, the Dana Point Harbor Water Quality Task Force, the Coastal Coalition, and the Aliso Creek Tier I and Tier II stakeholder meetings. These watershed groups focus their activities and discussions on broader watershed issues of concern, such as habitat restoration and flood control in addition to water quality issues resulting from Total Maximum Daily Loads (TMDLs) and special directives.

- Other Representation/Participation

The Principal Permittee actively represents the Permittees on various advisory stormwater fora, including, California Stormwater Quality Association (CASQA), Southern California Coastal Water Research Project (SCCWRP) (the County, representing the Orange County Stormwater Program, joined SCCWRP in 2005-06), Plastic Debris - Rivers to Sea Project, Nitrogen and Selenium Management Program, and Waste Discharge Requirements (WDR) for Fats, Oils and Grease (FOG) Program.

### 2.2.3 Program Documentation

The completion of the 2003 DAMP marked the culmination of a major program documentation overhaul and revision that was initiated by the preparation of the Report of Waste Discharge submitted on September 1, 2000. In addition to the revised policy commitments and model programs, the DAMP was expanded through the addition of appendices to include 34 individual jurisdictional LIPs (the Permittees formally identified which departments have responsibility for implementation of each program element), an extensive compendium of training materials, regional and jurisdictional program effectiveness assessment and reporting, and six watershed management plans.

### 2.2.4 Watershed Mapping

To support the development of the DAMP/Watershed Chapters, GIS-based mapping was undertaken for the S. County area initially to define watershed boundaries. It will be completed for the entire County area by the end of 2006 and will, for the first time, establish definitive watershed and sub-watershed boundaries for Orange County.

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## SECTION 2.0, PROGRAM MANAGEMENT

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### Orange County Watersheds (See **Figure 12.1**)

Orange County – Santa Ana Region	South Orange – San Diego Region
San Gabriel / Coyote Creek Watershed (within Orange County)	Laguna Coastal Streams Watershed
Anaheim Bay/Huntington Harbour Watershed	Aliso Creek Watershed
Santa Ana River Watershed (within Orange County)	Dana Point Coastal Streams Watershed
Newport Bay Watershed	San Juan Creek Watershed
Newport Coastal Streams Watershed	San Clemente Coastal Streams Watershed
	San Mateo Creek Watershed (within Orange County)

### 2.2.5 Fiscal Analyses

Annual fiscal analyses have been conducted since the inception of the Program. Each analysis identifies *shared costs* and *individual costs*. Shared costs are those that fund activities performed by the Principal Permittee. These activities include administration, program development, public education, and environmental monitoring. The projected-shared cost expenditures for the 2005-06 fiscal year, as approved by the Permittees, were \$5,941,160.

Individual Costs are those incurred by each Permittee arising from its jurisdictional program implementation as documented in the LIPs and comprise capital and operation and maintenance costs. Capital Costs refers to expenditures for land, large equipment, and structures and Operations and Maintenance Costs refer to normal costs of operation including the cost of keeping equipment and facilities in working order. The total individual Permittee costs for the 2005-06 fiscal year were projected to be \$91,868,883.

The fiscal analysis also requires the identification of funding sources. The funding sources used by the Permittees include: General Fund, Utility Tax, Separate Utility, Gas Tax, and Special District Fund, Others (Sanitation Fee, Fleet Maintenance, Community Services District, Water Fund, Sewer & Storm Drain Fee, Grants, and Used Oil Recycling Grants). **Figure 2.2** shows that general funds continue to support over half the cost of program implementation across Orange County.

## 2.3 **Assessment**

### 2.3.1 Implementation Agreement

Since the inception of the Program the Implementation Agreement has been amended to provide for the incorporation of new cities and to formally recognize the role of the TAC. The structure of the Agreement has accommodated the expansion of the program and the significant escalation of shared costs with the adoption of the Third Term Permits. More recently, the Agreement has served as a model for cost sharing collaboration related to the Newport Bay TMDL compliance effort (including the Nitrogen Selenium Management Program), Regional Harbor Monitoring Program, and

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## SECTION 2.0, PROGRAM MANAGEMENT

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Aliso Creek 13255 Directive. Consequently, it is considered to be an effective basis for cooperation of the Program.

### 2.3.2 Management Framework

USEPA defines a management framework *“as a lasting process for partners working together. It's a support structure making it easier to coordinate efforts--a structure made of agreed upon standard operating procedures, timelines, and forums for communicating with each other”*. On the basis of this definition, the current framework continues to effectively serve the Permittees. The Management Framework has enabled 36 local government entities to develop, implement and sustain coordinated regional and watershed-based approaches to water quality protection and management. The Framework provides a basis for all parties, including staff, management, executive management and elected officials to be informed and involved in the planning processes.

In addition to the established framework, an alternate management framework was conceived during the Third Permit Term by County senior management and the City Managers Association Water Quality Committee in the context of developing a countywide strategic approach to water quality protection based upon three watershed management areas. Conceptually endorsed by the County of Orange Board of Supervisors, this alternate structure will continue to be developed over the course of the Fourth Term Permits.

**Headline Indicator - Participation in General Permittee Committee:** In 2004-05, thirty four (34) out of thirty five (35) Permittees reported 80% or higher participation in the General Permittee Committee compared to thirty two (32) Permittees reporting 80% or higher participation in 2003-04.

The management framework is reviewed annually to ensure it meets program needs. All the committees/task forces have been effective in bringing forward initiatives to meet the requirements of the Third Term Permits and to address program needs under a consensus building production process.

While these outcomes point to the value and robustness of the current Framework, there has been significant turnover of staff in jurisdictional program manager positions. This has led to a regulatory agency perception that program managers lack the training and expertise necessary to effectively implement the “stormwater mandate.”

#### **ROWD Commitment:**

- Prepare a training schedule and define expertise and competencies for jurisdictional program manager positions.
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## SECTION 2.0, PROGRAM MANAGEMENT

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### 2.3.3 Program Documentation

International Organization for Standardization (ISO) 14000 provides criteria for evaluating the efficacy of management system documentation. The DAMP expresses the commitment of the Permittees to NPDES permit compliance and to addressing the adverse impacts of urban runoff on Orange County's creeks, rivers, streams and coastal waters. It establishes objectives, guides the participating organizations toward the development and implementation of BMPs, and commits the Permittees to an iterative process of improvement. It requires the designation of a program manager and assigns responsibilities (through the LIPs) for program implementation. Based upon these considerations, the DAMP meets formal environmental management system expectations for policy documentation. Moreover, the DAMP clearly identifies management procedures and provides for the internal and external communication of both policy and performance. The DAMP is also widely available to interested parties through its posting to [www.ocwatersheds.com](http://www.ocwatersheds.com).

While the comprehensive nature of the current documentation supports the implementation of the Program, it can be perceived as overwhelming in its complexity to both jurisdictional program coordinators who lack a long period of program association and outside constituencies seeking insights into the program. Moreover, the active consideration being given by regulators (e.g. the SWRCB's Blue Ribbon Panel) to possible future inclusion in NPDES permits of quantitative measures, including effluent limitations, underscores regulatory agency and environmental advocate perception of there being undue complexity and challenge with respect to establishing discharger accountability. It is possibly a perception which is being reinforced by overly comprehensive and complex program documentation. The Permittees started to address this issue of accessibility with the publication of the "popular format" *Orange County Stormwater Program Progress in 2002-2003* report and this document's subsequent acclaim points to the need for the more regular use of "popular" format reports. However, to address both the need for the DAMP to be more "accessible" and the Permittees' interest in validating a regulatory framework for stormwater predicated upon an auditable management system, the DAMP must more succinctly demonstrate to all constituencies that policies, objectives, and targets are properly identified and are being met, that regulatory compliance is being achieved, and that the planning processes provide for iterative improvement.

#### **DAMP Modification:**

- Revise the DAMP for greater consistency with established Environmental Management System (EMS) principles and improved accessibility to different constituencies and levels or readership.

### 2.3.4 Fiscal Analyses

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## SECTION 2.0, PROGRAM MANAGEMENT

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The significant year-to-year variability in reported program costs (**Figure 2.3**), which cannot be attributed to changes in program management, point to the clear need for an assessment of the fiscal reporting process.

### **ROWD Commitment:**

- Prepare a fiscal reporting strategy based upon a review of the fiscal analysis reporting section of the PEA, to better define the expenditure and budget line items included in the fiscal report.

**Figure 2.1: Orange County Municipal NPDES Management Framework**

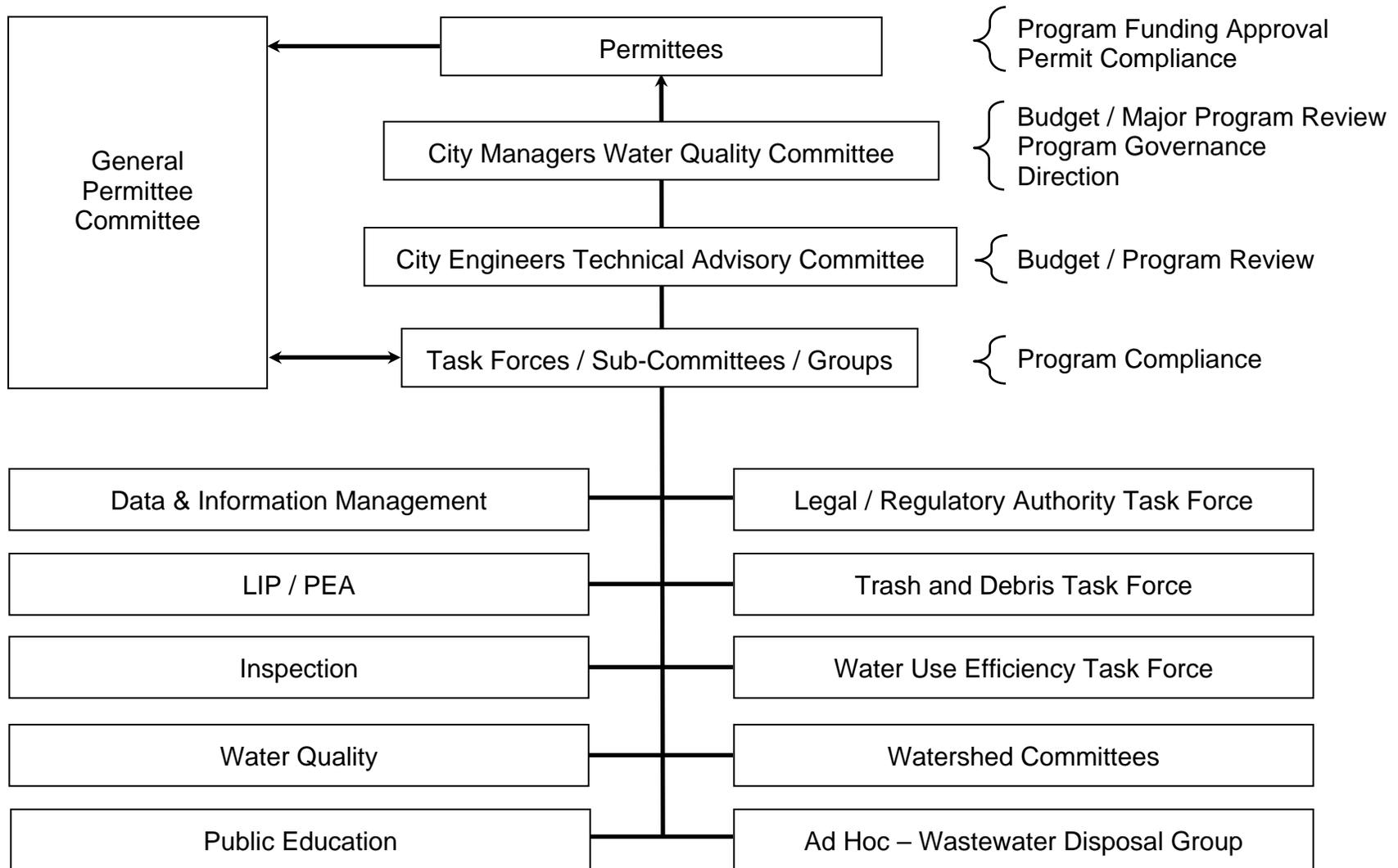


Figure 2.2: 2004-05 Funding Sources

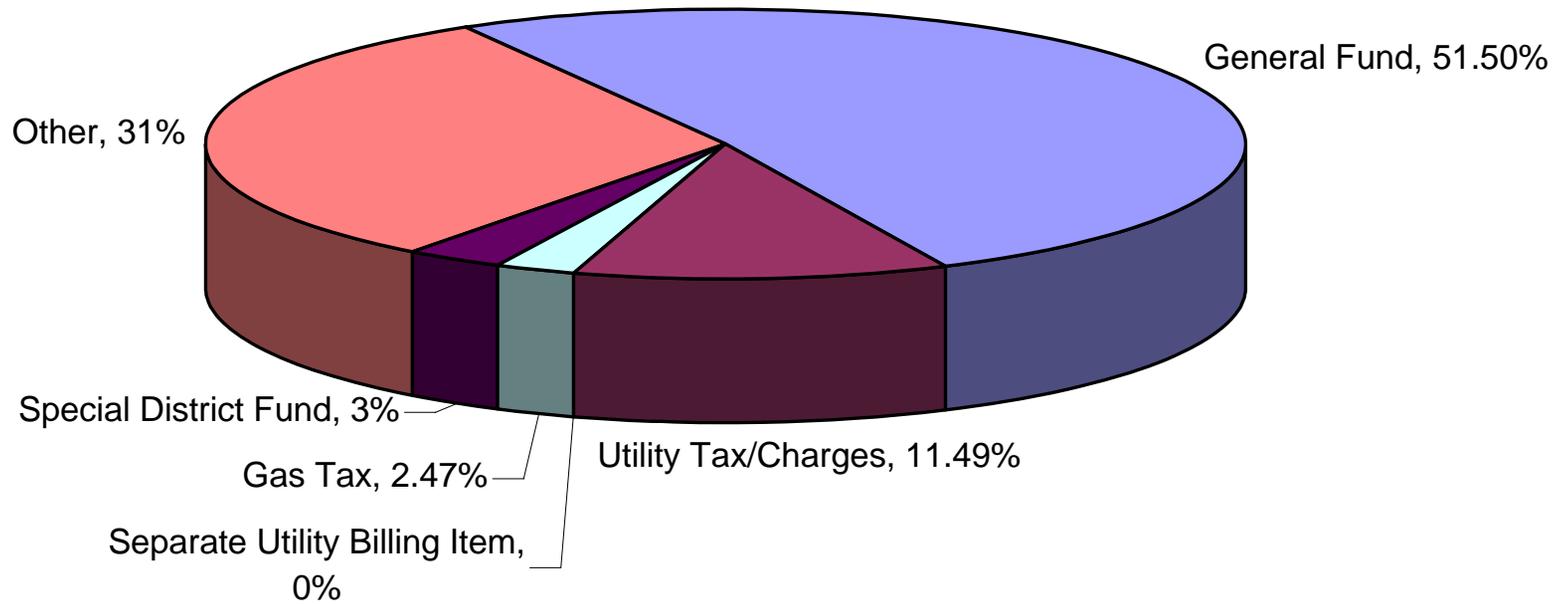
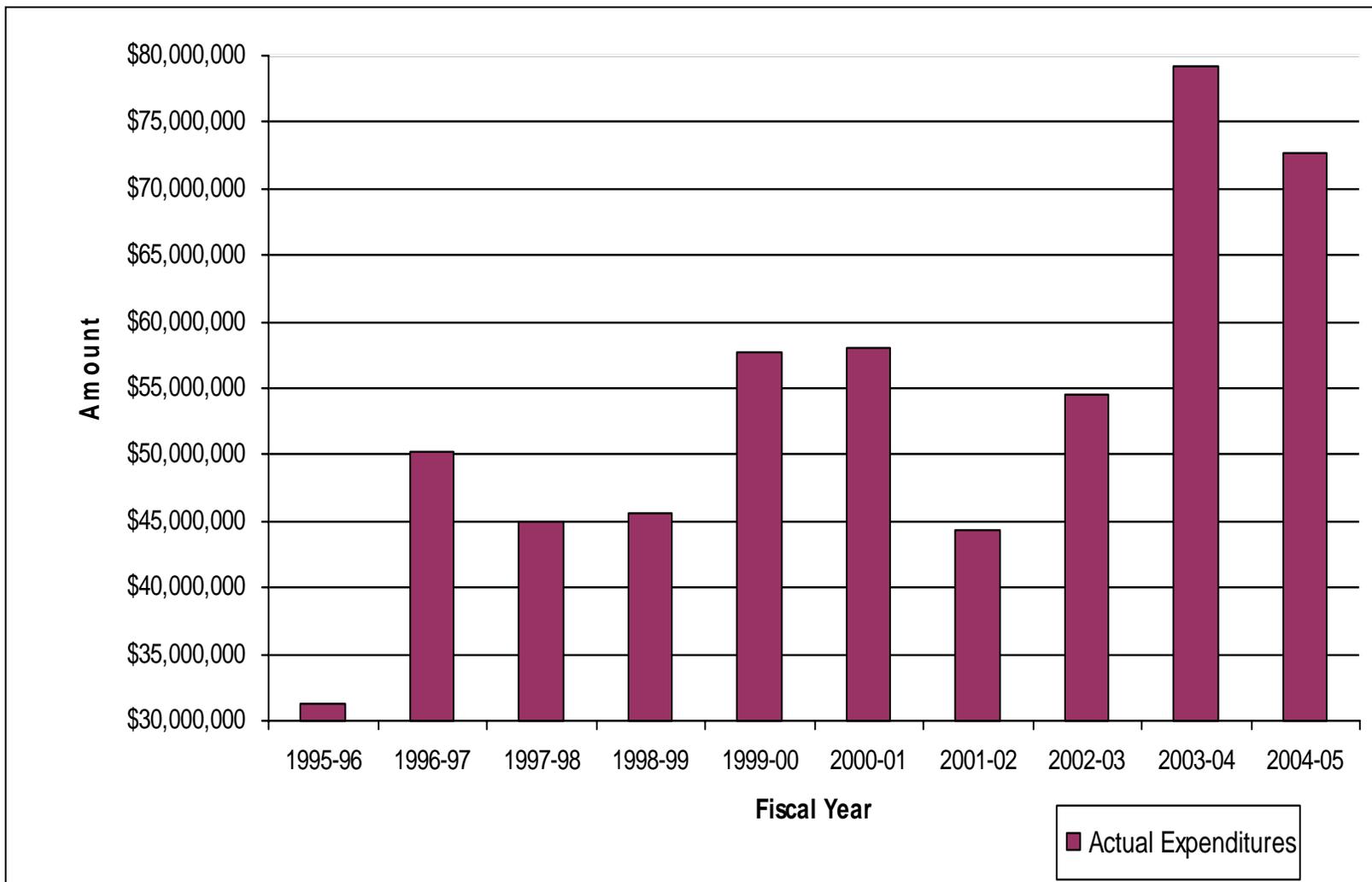


Figure 2.3: Historical Review of Total Individual Permittee Costs



## 3.0 PLAN DEVELOPMENT

### 3.1 Introduction

The DAMP sets forth a countywide approach for urban stormwater management by:

- Establishing a baseline set of BMPs that are applicable to all areas and that are proven and cost-effective;
- Monitoring water quality to assess progress and identify urban impacts on receiving water;
- Prioritizing waterbodies for corrective action, with those listed as impaired having a higher priority; and
- Focusing on enhanced BMPs for constituents of concern at a watershed or jurisdictional level, as appropriate.

The purpose of **DAMP Section 3.0** is to describe an iterative planning process, informed by programmatic BMP assessments and environmental monitoring, which support the progressive evolution attainment of water quality standards, as required by the NPDES Permits.

### 3.2 Accomplishments

#### 3.2.1 Enhancements to DAMP: Iterative Planning Processes

A defining feature of the iterative planning process is the continual analysis, measurement and improvement through the quality loop which is illustrated in a simplified form in **Figure 3.1**:

**Assessing:** Assessing environmental conditions and programmatic performance, establishing the goals and targets to be achieved, and determining the route to be taken and the measurements to track success;

**Planning:** Designing activities to achieve the goal, identifying the needed skills and expertise, and designating responsibility for achieving desired outcomes;

**Implementing:** Striving to bring the process into effect in an efficient and effective manner, and

**Monitoring:** Evaluating the effectiveness of the *Implementing* stage.

With the adoption of the Third Term Permits, the DAMP which previously had presented policy and programmatic guidance, was revised to incorporate greater individual accountability through jurisdictional Local Implementation Plans (LIPs) (see **DAMP Appendix B**). The LIPs provide a flexible jurisdiction-specific plan within the broader policy and model program framework of the DAMP.

With additional permit mandates to institute watershed-based planning, water quality

planning in the context of the DAMP is now evident as two separate, but nonetheless similar and highly interdependent, processes targeting the control of pollutants in urban runoff. These processes (**Table 3.1; Figure 3.1**) are now recognized in the DAMP as:

- DAMP/LIP – Directed by jurisdictional assessments completed individually by each Permittee and a countywide assessment through a Unified Annual Progress Report.; and
- DAMP/Watershed Action Plan (WAD) (See **DAMP Appendix D**) – Directed by watershed scale assessments in Watershed Annual Reports.

### 3.2.2 Enhancements to DAMP: Programs and BMPs

Assessment is the part of the planning cycle that involves either initial investigation of the environmental conditions that are being addressed by the management program or, in subsequent iterations of the planning cycle, re-assessment to determine program effectiveness (i.e. if the actions being implemented are contributing to programmatic goals). It encompasses programmatic (including technology evaluations) and environmental enhancements and is itself an evolving area of stormwater management.

#### *Programmatic Enhancements*

To assist the Permittees with reporting the status of LIP implementation and the performance of the individual jurisdictional stormwater quality management programs, a Program Effectiveness Assessment (PEA) reporting framework (**DAMP Appendix C**) was developed in 2002-03. The PEA:

- Facilitates the collection and compilation of specific stormwater program implementation data and progress validation indicators;
  - A PEA template was created in 2003 and has been the basis of the 2002-03, 2003-04, and 2004-05 Annual Reports. In 2005, the template was converted into an internet-based reporting system.
- Provides for program effectiveness assessment by the individual Permittees and the Principal Permittee on a jurisdictional, watershed and/or countywide basis;
  - The PEA identifies specific programmatic and environmental performance metrics including specified validation indicators titled, “Headline Indicators.” (See Section 1.2.2)
- Ensures that an evaluation and improvement process is applied on a jurisdictional, watershed and/or countywide level to determine where modifications within the DAMP, LIP or WAP may be necessary; and
- Provides a mechanism for the Permittee to identify and report modifications that have or will be made to their LIP.

### *Enhancements in BMP Knowledge*

A number of BMP evaluations, with countywide application, have been undertaken. These studies include the *BMP Effectiveness and Applicability for Orange County* (see **DAMP Appendix E1**); *Trash and Debris BMP Evaluation* (see **DAMP Appendix E2**); *Erosion Control BMP Effectiveness Study* (see **DAMP Appendix E3**); *Septic System Inventory and Assessment* (see **DAMP Appendix E4**); *Portable Toilet Pollution Prevention Program* (see **DAMP Appendix E5**), *Dry Weather Diversion Study* (see **DAMP Appendix E6**), *BMP Retrofit Opportunity Study* (see **DAMP Appendix E7**), and *Tustin Area Spill Containment Project* (see **DAMP Appendix E8**).

- *BMP Effectiveness and Applicability for Orange County*

This study was commissioned to review existing information on available structural BMPs and to organize and present specific information to facilitate the selection, siting, design, construction and maintenance of the most appropriate and cost-effective BMPs for a particular site in Orange County. The study recommended consideration be given to using extended detention basins, vegetated swales, vegetated buffer strips, bioretention, sand and organic filters, infiltration basins and infiltration trenches. In 2005, the study report was updated to include flow reduction BMPs developed in conjunction with the Nitrogen and Selenium Management Program.

- *Trash and Debris BMP Evaluation*

The objectives of the study were to review characterization information on trash and debris in Orange County and to identify candidate structural BMPs. The study concluded that site characteristics such as hydraulic head or footprint may be the principal determinants of BMP selection. During the reporting period the findings of this study were developed into a BMP selection guide for retrofit applications to modify an existing facility to provide a water quality (trash/debris removal) function. This guide will be finalized in 2006-07 and incorporated into **DAMP Appendix E**.

- *Erosion Control BMP Effectiveness Study*

The study was conducted to evaluate selected erosion methodologies for graded building pads with the goal of providing information on (1) the effect of time and weathering on product condition; (2) the frequency a product must be applied to be effective; (3) the maximum slope on which a product will perform effectively; and (4) how product performance is affected by soil types. The study comprised an evaluation of two types of hydraulic mulch (paper and wood based), two types of polyacrylimide (low and high molecular weights), and wood mulch (without a binding agent). The findings of the evaluation, which will be reported in the **2005-06 Unified Report** and incorporated into **DAMP Appendix E**, will be used to form the basis of a program recommendation on county pre-approved

BMPs.

- *Septic System Inventory and Assessment*

The objectives of this study were to develop an inventory/database of the septic systems in Orange County and to estimate the potential impact of septic systems on the quality of selected receiving waters. The final inventory/database compilation resulted in a list of over 2776 active septic systems which are widely dispersed throughout the County but are found in the highest concentrations in the Santa Ana River watershed. In the course of conducting eighty field surveys, one failed system was noted, representing a failure rate of 1.25% which was consistent with a similar finding in the literature. The study concluded that septic systems do not represent a significant source of constituents of concern (particularly fecal indicator bacteria and nutrients) for Orange County receiving waters.

- *Portable Toilet Pollution Prevention Program*

The objectives of the evaluation were to: (1) determine the nature of existing operational practices and regulatory oversight structure; (2) assess the extent to which the present practices associated with their use and maintenance were adversely impacting surface water quality; and (3) recommend appropriate revisions to current operational practices or regulatory oversight as warranted. The study determined that current standard industry practices for use, maintenance, transport and storage of portable toilets within Orange County are generally found to be sufficiently responsible to prevent impacts to receiving waters.

- *Dry Weather Diversion Study*

The dry weather diversion study was prepared to evaluate the diversions to the sanitary sewer that are in place or proposed within Orange County and to identify decision-making criteria to be used in selecting diversions as a preferred BMP. A recommended procedure for prioritizing implementation of diversion facilities was developed for the area of Orange County served by the Orange County Sanitation District.

- *BMP Retrofit Opportunities Study*

In 1997-98, the feasibility of incorporating BMP retrofits to optimize beneficial use attainment began to be addressed in the context of the long-term water quality planning initiatives being conducted within Orange County, a number of which were in cooperation with the Army Corps of Engineers. To supplement these earlier efforts, during 2003-04, a countywide evaluation was initiated using a GIS-based model to identify opportunities within the existing storm drain infrastructure for configuring/reconfiguring storm drains or channel segments in order to improve water quality and maintain the designated beneficial uses

## SECTION 3.0, PLAN DEVELOPMENT

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(see **DAMP Appendix E**). This effort was continued in 2005-06 with further use of the GIS-based model.

- *Tustin Area Spill Control (TASC) Demonstration Project*

To address the various regulatory, technical and coordination issues associated with preventing and planning for sanitary sewer overflows (SSOs), the County, as Principal Permittee, and the Orange County Sanitation District (OCSD) initiated a pilot project titled Tustin Area Spill Control (TASC) Demonstration Project. The project's accomplishments to date include:

- Development of SSO response procedures;
- Selection of primary and backup sewage spill response contractors for containment and recovery of sanitary sewer overflows;
- Conducting SSO desktop and hands-on field response training with the contractors; and,
- Development of a Memorandum of Understanding for delineating jurisdictional and financial responsibilities within the TASC project.

### *Enhancements in Technologies and Methodologies*

A number of important initiatives are being supported by the Permittees aimed at the development of assessment techniques and methodologies to support more informed and consistent decision making across Southern California and statewide, including projects being undertaken with the Southern California Stormwater Monitoring Coalition, University of California, Irvine (UCI) for the development of the California Sustainable Watershed/Wetland Information Manager (CalSWIM) - prototype database, and the California Stormwater Quality Association (CASQA) initiative on program effectiveness assessment.

Findings of the extensive water quality monitoring program during the reporting period are discussed in **Section 11.0**. However, concurrent with this data collection effort are a number of important initiatives, being supported by the Permittees, that are aimed at the development of assessment techniques and methodologies to support more informed and consistent decision making across Southern California. Notable amongst these initiatives are the Regional Research Monitoring Program (Stormwater Monitoring Coalition) and the Development of the California Sustainable Watershed/Wetland Information Manager (CalSWIM) - prototype Database.

- *Regional Research Monitoring Program (Stormwater Monitoring Coalition)*

The goal of the Southern California Stormwater Monitoring Coalition (SMC) is to identify region-specific research needs to better understand stormwater mechanisms and impacts, and to collectively sponsor the development of assessment techniques and methodologies that will enable more informed and consistent stormwater management decision-making across the region.

The SMC has initiated several of the 15 research projects identified in the research needs agenda, including: microbial source tracking method comparison,

development of standardized sampling and analysis protocols, implementation of a laboratory intercalibration program, peak flow impact assessment, and the development of a regional integrated freshwater stream bioassessment monitoring program.

- *Development of California Sustainable Watershed/Wetland Information Manager (CalSWIM) – Prototype Database*

In response to a commitment to develop a prototype watershed database for cumulative impact assessment, the County of Orange as Principal Permittee has worked with UCI in developing and implementing a prototype database called the California Sustainable Watershed/Wetland Information Manager (CalSWIM). CalSWIM is a web-based expert system and database focused, initially, on Newport Bay and the Newport Bay watershed and can be viewed at [www.calswim.org](http://www.calswim.org). The technical objective of CalSWIM is to provide an interactive platform for coastal wetland and watershed managers, planners, and engineers to explore alternative wetland and watershed management strategies.

- *CASQA Program Effectiveness Assessment White Paper*

The preliminary *White Paper* introduced and discussed key concepts and provided a standardized terminology related to the development of a comprehensive framework for assessing the effectiveness of stormwater management programs. It briefly defined and categorized potential outcomes, measures, and methods to be used in conducting assessments, and provided examples of how several programs are already utilizing these tools to assess their effectiveness. It also discussed the current needs of stormwater program managers with respect to program assessment. The issues addressed in this paper will form the basis for more detailed guidance on effectiveness assessment that is being developed by the CASQA Effectiveness Assessment Subcommittee during 2006.

### 3.3 Assessment

The Permittees recognize that knowledge in the field of stormwater quality is rapidly evolving and that the BMPs within the DAMP/LIP must be revised, deleted or added to in order for the program to stay current. In addition, water quality problems caused by urban stormwater that are identified either through environmental monitoring or regulatory interventions will elevate the need for additional or new BMPs to be implemented.

#### 3.3.1 Iterative Planning Processes

While the ROWD itself serves to identify new programmatic commitments (see **Sections 5.0 through 10.0**), and is thereby evidence of the iterative approach, the DAMP has not, to date, detailed a process for programmatic change in response to improved knowledge of water quality controls and best management practices.

**DAMP Modification:**

- Revise **DAMP Section 3.0** plan improvement process to detail the plan improvement process.

3.3.2 Programmatic Assessment

The PEA template created in 2003, and used as the basis of the 2002-03, 2003-04, and 2004-05 Annual Reports, has been helpful in establishing a series of metrics for spatial (i.e. jurisdictional comparisons) and temporal (i.e. year-to-year comparisons) assessments of program effectiveness. However, the reporting has highlighted significant inconsistencies in metric interpretation across the jurisdictions of the Orange County Stormwater Program that require further standardization.

**ROWD Commitment:**

- Prepare metric definitions and guidance to improve efficacy of the assessment process.

3.3.3 BMP Assessment

Over the course of the Third term Permits a number of BMP evaluations have been undertaken. The recommendations arising from these studies are presented as ROWD commitments or DAMP Modifications in the subsequent sections of this ROWD as appropriate.

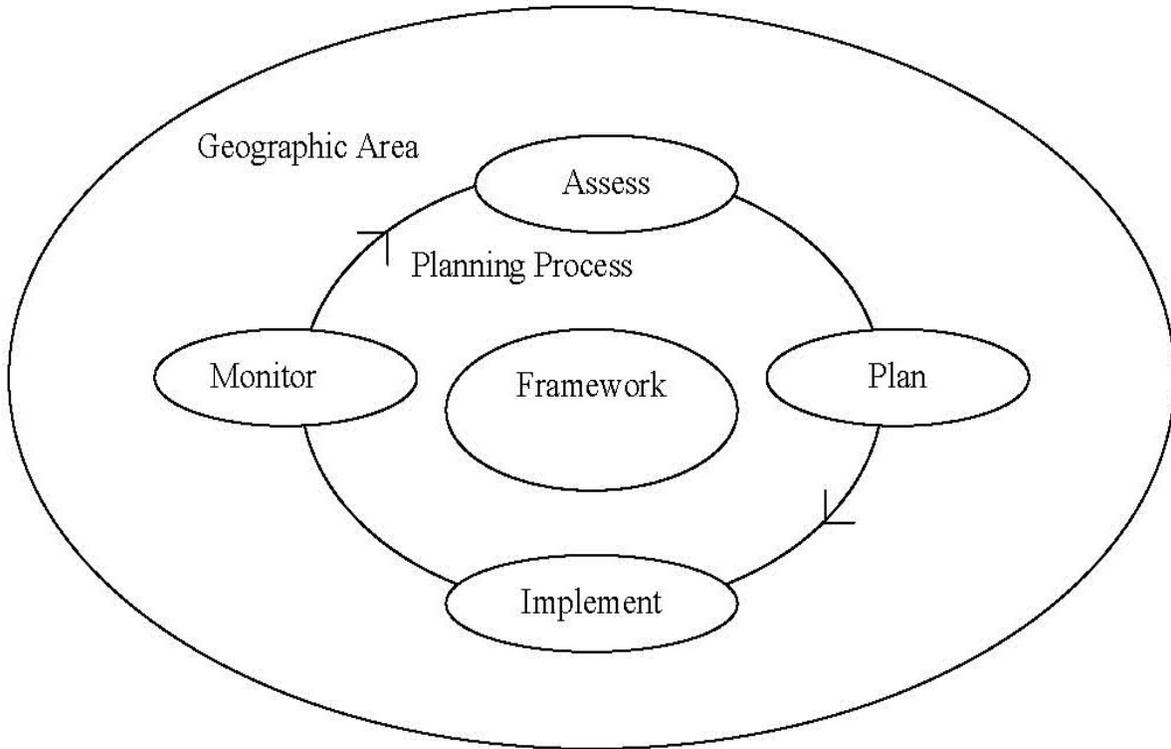
**3.4 Summary**

The Permittees consider **DAMP Section 3.0** to define the iterative planning processes, informed by programmatic and BMP assessments, that are the basis of the DAMP. Based upon this evaluation of the process, the principal finding is that the language of the DAMP can be revised to better define these processes at separate, but interrelated, jurisdictional, watershed and countywide levels. The Permittees have also identified a need to standardized annual reporting data further in order to enhance effectiveness assessment.

**Table 3.1: Comparison of Water Quality Planning Processes**

	<b>DAMP/LIP</b>	<b>Watershed Action Plan</b>
<i>Geographic Area Covered by Plan</i>	Defined by political (city/County) boundaries.	Defined by hydrologic boundaries.
<i>Planning Process</i>	Focused on reducing discharges of pollutants in urban runoff and stormwater pollution on a uniform countywide basis. Directed by DAMP/LIP in conformance with NPDES permits requirements.	Focused on improving local receiving water quality where it is adversely impacted by urban runoff and stormwater pollution. Directed by NPDES permits and 303(d) list.
<i>Framework</i>	Directed by Stormwater Program committee structure and Regional Board review. Public consultation principally through CEQA process/Regional Board review.	Directed by municipal and public agency stakeholders. Characterized by public participation.
<i>Assessment</i>	Based on countywide municipal and regional cooperative investigations of stormwater and receiving water quality. Assessments are undertaken annually (LIP) and every 5 year (DAMP).	Based on information from watershed specific investigations. Assessments are undertaken on an annual basis.
<i>Planning</i>	Broad based approach with emphasis on well established pollution prevention and source control measures.	Pollutant specific approach with emphasis on treatment controls and consideration of innovative regional solutions.
<i>Implementation</i>	Individually by Permittees.	Individually and collaboratively by Watershed Permittees and other agencies.
<i>Monitoring</i>	Considers pollutant load reduction.	Considers beneficial use attainment.

**Figure 3.1: Water Quality Planning Process**



## 4.0 LEGAL AUTHORITY

### 4.1 Introduction

The ability of the Permittees to comply with the requirements of the Third Term Permits is contingent upon the establishment, by each Permittee, of adequate legal authority to support control program implementation. **DAMP Section 4.0** discusses the development, starting in 1993, of a Model Water Quality Ordinance that was used by the Permittees as the basis of their local ordinances that were adopted by 1997. It also commits the Permittees to reviewing their ordinances to determine if any modifications are necessary in order to comply with new NPDES Permit requirements.

### 4.2 Accomplishments

With the adoption of the Third Term Permits in early 2002, the Permittees reviewed and verified the adequacy of their legal authority as the legal basis for the activities required for Third Term Permit compliance, primarily **DAMP Sections 7.0, 8.0, 9.0, and 10.0**. Following this initial review and verification, the responsibility for maintaining the efficacy of this key program element has rested with the Legal and Regulatory Task Force (see **Section 2.3.1**). During the reporting period, this Task Force has focused on a number of key areas including:

- Review and revision of legal authority as necessary regarding the stipulation of mandatory minimum BMPs in the San Diego Region;
- Review of inspection authority and “right of entry” at industrial/commercial facilities;
- Identification and resolution of overlap in legal authority within requirements of the WDR FOG program;
- Examination of the various Total Maximum Daily Load (TMDL) initiatives and their relationship to NPDES permits; and
- Perpetuation of BMP upkeep and maintenance in Water Quality Management Plans (WQMPs) for New Development/Significant Redevelopment.

Arising from the work of the Task Force have been continued findings of legal authority adequacy and the development of a model approach to WQMP recordation.

### 4.3 Assessment

The program effectiveness assessment outcome level for the **DAMP Section 4.0** is presented in **Table 4.1**. However, beyond confirming compliance with the Permits, the Permittees’ legal authority can also be assessed in the context of the sections of the DAMP that it primarily supports.

#### 4.3.1 Legal Authority to Implement Existing Development and ID/IC Programs

In 2005, an action taken under the Ordinance requiring a property owner to effect the removal of manure from a creek under the authority of the jurisdiction’s water quality

ordinance was formerly challenged under the ordinance's appeal provisions. The jurisdiction prevailed in the third party adjudicated appeal hearing and again at a subsequent trial in an action brought by the Orange County District Attorney. These results, in addition to the numerous successful administrative actions and citations detailed in **Sections 8.0, 9.0 and 10.0** of this report, validate the robustness of the Permittees' legal basis for implementing **DAMP Sections 9.0 and 10.0**.

### 4.3.2 Legal Authority to Implement New Development Program

The New Development/Significant Redevelopment component of the Program ends with permit close-out and the BMPs implemented in conformance with DAMP Section 7.0 transition to the Existing Development component. As noted in **Section 7.3.1**, the Permittees believe that the BMP approach to stormwater management could be more effectively sustained by ensuring the longevity and enforcement of the approved WQMP against subsequent property owners for ongoing responsibility for BMP maintenance. The ROWD Commitment in **Section 7** to develop guidance on the recordation process and appropriate documentation to enable such enforcement will be fulfilled under the aegis of the Legal and Regulatory Task Force.

## 4.4 Summary

The Permittees validated the legal basis for implementing the DAMP in early 2002 and over the balance of the period of the Third term Permit continued to review aspects their legal authority under the aegis of the Legal and Regulatory Task Force. This review and the formal legal challenge to this authority in late 2005 and early 2006 have served to affirm the basic robustness of the Permittees' water quality ordinances.

SECTION 4.0, LEGAL AUTHORITY

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**Table 4.1: Current and Potential Outcome Levels (Legal Authority)**

Legal Authority	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
<b>Water Quality Ordinance</b>	✓ Adopt and Maintain Adequate Legal Authority					
<b>Training</b>	✓ Track number/type of training sessions	<sup>P</sup> Surveys show improved knowledge				
<p><u>Key:</u>                      ✓ = Currently Achieved Outcome Level  <sup>P</sup> = Potentially Achievable Outcome Level</p>						

## 5.0 MUNICIPAL ACTIVITIES

### 5.1 Introduction

The Permittees own and operate facilities and build and maintain much of the transportation, drainage and recreational infrastructure of the urban environment. The primary purpose of **DAMP Section 5.0** is to ensure that, through a systematic process of evaluation, BMPs are incorporated into these activities. **DAMP Section 5.0** also requires a commitment to implement Integrated Pest Management (IPM) approaches. In addition, **DAMP Appendix C** requires performance reporting related to a number of Established BMPs that have been recognized, since the inception of the Program, as significant contributors to pollutant load reduction.

### 5.2 Accomplishments

#### 5.2.1 Model Municipal Activities Program

The Model Municipal Activities Program was developed and implemented in 2002-03 and replaced the environmental performance reporting program of the Second Term Permits. It establishes a framework for conducting a systematic program of evaluation and BMP implementation targeting fixed facilities, field programs and drainage facilities. The Model Municipal Activities Program requires the Permittees to:

- Compile facility and program inventories:

2,302 facilities have been reported as inventoried (2004-05 reporting period) and are subject to the program (**Table 5.2; Figure 5.1**).

- Prioritize facilities and programs based upon water quality threat and receiving water sensitivity:

There are a reported 1,070 high priority, 126 medium priority, and 1,106 low priority municipal facilities (**Table 5.2; Figure 5.1**)

- Establish model maintenance procedures:

Sets of BMP factsheets were produced for Fixed Facilities (13 factsheets), Field Programs (7 fact sheets) and Drainage Facilities (1 fact sheet). The factsheets are available at

[http://www.ocwatersheds.com/StormWater/documents\\_damp\\_lip.asp](http://www.ocwatersheds.com/StormWater/documents_damp_lip.asp)

(Section 5 of the County of Orange/Orange County Flood Control District 2005-06 Local Implementation Plan).

- Conduct inspections:

Standard general and activity specific inspection forms have been developed for Fixed Facilities, Field Programs and Drainage Facilities. In addition, by the end

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## SECTION 5.0, MUNICIPAL ACTIVITIES

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of 2006, 2,326 municipal facilities were reported as having been inspected for stormwater issues (**Table 5.3**).

- Implement BMPs:

At the end of the 2004-05 reporting period, 1,968 municipal facilities were determined to have full BMP implementation (**Table 5.3**).

- Undertake training:

Three training modules have been developed, specifically, Municipal Activities program Training, Fixed Facility Model Maintenance Procedure Training and Field Program Model Maintenance Procedure Training.

### 5.2.2 Model Integrated Pest Management, Pesticide and Fertilizer Guidelines

Landscaping is best managed using an integrated system of tactics that include biological, mechanical, physical, cultural, and chemical control. This system, known as IPM, relies on careful monitoring of the plants to identify when a chemical or other control action should be taken. In June 2001, the Principal Permittee entered into a five-year agreement with the University of California Cooperative Extension (UCCE) to conduct water quality monitoring studies and implement water quality improvement programs in areas where the University has special expertise, particularly related to fertilizer and pesticide applications (Note: On May 10, 2005, the agreement was revised and extended for up to six additional years). In close cooperation with the UCCE, Model IPM, Pesticide and Fertilizer Guidelines were completed in 2002-03. The Guidelines require the Permittees to:

- Conduct IPM self-audits:

With oversight and assistance from UCCE, the Permittees have completed self-audits of the Model IPM, Pesticide and Fertilizer Management Guidelines implementation. Audits have been conducted annually as part of annual progress reporting.

- Implement the Model IPM, Pesticide and Fertilizer Management Guidelines based upon IPM principles:

Fifty-seven percent (57%) of the Permittees are able to report that they operate under a formal written IPM policy.

Thirty-five (35) Permittees reported that approximately 363,146 pounds of nitrogen were applied to 6,862 acres of public land during the 2004-05 reporting period representing a third consecutive year of reduction (the 2005-06 figure represents a 2% decrease from the pounds per acre of nitrogen usage in 2003-04; a decrease of 27% from 2002-03; and a 12% decrease from 2001-02) (**Table 5.4**).

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## SECTION 5.0, MUNICIPAL ACTIVITIES

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During the 2004-05 reporting period, approximately 19,227 pounds of active ingredients (AI) of pesticides were applied by the Permittees representing a 30% reduction in use since the inception of the program (**Table 5.3**).

- Undertake Training:

Training has been provided annually.

### 5.2.3 Established BMPs

Performance indicators for certain Established BMPs have been tracked since the inception of the Model Municipal Activities Program. These BMPs are street sweeping, solid waste collection, catch basin stenciling, drainage facility maintenance, trash & debris Control (formerly litter control), household hazardous waste collection, and used oil grant participation.

- Street Sweeping:

All Permittees maintain street sweeping programs in residential, commercial and/or industrial areas. In 1993 the Permittees compiled information regarding their existing street sweeping schedules and practices and have subsequently changed elements of their programs such as the types of sweepers purchased, the frequency of sweeping, and the use of parking restrictions in order for the street sweeping program to aid in water quality improvements.

85,516 tons of material was removed from the streets and gutters during the 2004-05 reporting period. This effort appears to represent a 12% increase for weight of material collected over the previous reporting period and a 25% increase over the tons of material reported in 2002-03. This amount represents a 87% increase in the weight of material collected over the 2001-02 total, indicating a marked increase in effort in this area of infrastructure maintenance in the Third Term Permit cycle. (**Table 5.5; Figure 5.2**).

- Solid Waste Collection:

The Permittees have solid waste collection programs for public, residential, commercial and industrial areas.

3,959,590 tons of solid waste was collected during the 2004-05 reporting period. This effort appears to represent a 9.1% increase in the amount of solid waste collected over the previous reporting period, an 8.8% increase over the reported total in 2002-03, and a 7.0% increase over the reported total in 2001-02 (**Table 5.6; Figure 5.3**).

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- Catchbasin Stenciling:

Over 37,000 stormdrain inlets have been stenciled. Each year 6,000 – 9,000 inlets are re-stenciled.

- Drainage Facility Maintenance:

The Permittees inspect the drainage system within their jurisdictions annually and clean out accumulated debris on an as needed basis. Removal of accumulated debris and sediment is carried out either manually or by mechanical methods using flushing – in emergency situations only – in accordance with established maintenance procedures (Model Maintenance Procedure DF-1). By removing this material from the catch basin inlets and stormdrain system, the Permittees make a significant contribution in preventing the passage of these materials in downstream receiving waters.

5,612 tons of debris was removed from drainage facilities in 2004-05. This amount represents a 43% decrease in the amount of debris collected from drainage facilities when compared to the previous reporting period, a 77% decrease in the amount collected in 2002-03 and a 6.5% decrease in the amount collected in 2001-02 (The 2002-03 reported total suggests inconsistent reporting of this Indicator or other environmental factors such as Santa Ana winds) (**Table 5.7; Figure 5.2; Figure 5.3**).

- Trash & Debris Control:

Trash and debris control is an important element in the diversion of litter and other solid materials from the storm drain system. Although most Permittees historically viewed litter control as a public service program (i.e., preventing visual blight, etc.), rather than as a pollution control problem, it is now considered important as a visual indicator of water quality and an aspect of the recreational use of a waterbody.

Eleven (11) trash and debris booms have been installed in flood control channels and harbors to recover floatable material.

Inner-Coastal and Watershed Cleanup Day, which engages the public directly in the cleanup of trash and debris, has been heavily promoted by the Orange County Stormwater Program. In 2002, 1,722 volunteers joined in and collected 29,503 pounds of trash and 5,350 pounds of recyclables. In 2003, 2,473 volunteers collected 52,474 pounds of trash and 5,447 pounds of recyclables at 37 sites. In 2004, 6,001 volunteers collected 78,390 pounds of trash and 9,563 pounds of recyclables at 38 sites. In 2005 the number of clean-up sites increased to 43.

The Permittees have participated in the preparation of a number of strategic assessments of litter control efforts including *A Review Of Current Trash Pollution and Mitigation Efforts in Orange County: Final Report January 2006* prepared under

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the auspices of the Trash & Debris Task Force and the Algalita Marine Foundation/California Coastal Commission *Plastic Debris: Rivers To Sea* initiative in which the Principal Permittee was represented on the advisory board.

- Household Hazardous Waste Collection:

Orange County has a household hazardous waste collection program administered by the Integrated Waste Management Department (IWMD). The program comprises four sites (Anaheim, Huntington Beach, San Juan Capistrano, and Irvine).

A total of 6,303,938 pounds of household hazardous waste was collected in the 2004-05 reporting period representing a 9.8% increase from the previous reporting period, a 48.7% increase from the 2002-03 reporting period, and 68.7% increase from the 2001-02 reporting period (**Table 5.8; Figure 5.6**).

- Used Oil Grant Participation:

Most of the Permittees, as well as the County's Health Care Agency, currently implement used oil recycling programs. These programs involve comprehensive public outreach including television and newspaper advertising, displays at community events, and the distribution of used oil containers at no cost to residents.

Twenty seven (27) Permittees reported having a Used Oil Grant participation program for 2004-05, 28 Permittees in 2003-04 and 27 Permittees in 2002-03 (**Table 5.9; Figure 5.7**).

### 5.3 Assessment

The current and potential program effectiveness assessment outcome levels for the Municipal Activities Program are presented in **Table 5.1a** (Model Municipal Activities Program) and **Table 5.1b** (Model IPM and Fertilizer Guidelines).

#### 5.3.1 Model Municipal Activities Program

The Model Municipal Activities Program superceded the Environmental Performance Reporting (EPR) program of the Second Term Permits. Nonetheless, elements of the EPR program were carried over into the **2003 DAMP**. The **ROWD** is therefore recognized by the Permittees as an opportunity to eliminate the redundant vestiges of the prior inspection and oversight program.

The fixed facility inventory has fluctuated significantly over the reporting period (see **Table 5.2**) pointing to the need for the better definition of key program terms.

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**Indicator – Prioritization of Facilities:** For 2004-05, 2,302 industrial facilities were prioritized, 46% of which were ranked as high priority; for 2003-04, 2,418 industrial facilities were prioritized, 49% of which were ranked as high priority; and for 2002-03, 2,380 industrial facilities were prioritized, 46% of which were ranked as high priority (**Table 5.2**).

Level 1: Implement Program

Level 3: Behavior Change

In addition, the number of designated “high priority” facilities has remained at approximately 1,100 annually (**Table 5.2**) despite the initial intention for the program to be risk-based and the significant level of BMP implementation (i.e. risk mitigation) that has occurred over the period of the Third Term Permits. It is also apparent that the application of a “high priority” designation has varied significantly between the Permittees, reflecting both different SAR and SDR Permit requirements and individual Permittee interpretations of the prioritization process.

### **DAMP Modification:**

- Eliminate Environmental Performance Reporting (EPR) program (which is duplicative of Model Municipal Activities Program).
- Define “fixed facilities,” “field programs,” and “drainage facility sites.”

### **ROWD Commitment:**

- Standardize SDR and SAR definitions of “high priority” and develop prioritization process that is better predicated on the threat (diminished by BMP implementation) posed by the facility, and considers the presence of “constituents of concern.”

### 5.3.2 Model Integrated Pest Management, Pesticide and Fertilizer Guidelines

The majority of fertilizers are applied to turfgrass with a smaller amount utilized on landscape material (trees, shrubs, groundcovers, and vines). Countywide, municipal fertilizer use has declined. However, other indicators of a shift toward more of an IPM-

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oriented approach show little change; e.g. utilization of slow-release fertilizers, timing of fertilizer applications, and use of soil analyses.

**Headline Indicator -Reduction in Total Fertilizer Usage (Nitrogen):** Thirty-five Permittees (35) reported that approximately 363,146 pounds of nitrogen were applied to 6,862 acres of public land during the 2004-05 reporting period (53 lbs/acre). This figure represents a 2% decrease from the pounds per acre of nitrogen usage in 2003-04; a decrease of 27% from 2002-03; and a 12% decrease from 2001-05.

Level 3: Behavior Change

**Headline Indicator - Reduction in Total Fertilizer Application (Phosphorus):** Thirty-five Permittees reported that 81,600 pounds of phosphorus were applied to 6,862 acres of public land during the 2004-05 reporting period (12 lbs/acre). This figure represents a 20% decrease from the pounds per acre of phosphorus applied in 2003-04; a decrease of 33% from 2002-03; and an 8% decrease from 2001-05.

Level 3: Behavior Change

There also appears to have been an overall reduction in pesticide use. However, as with fertilizer use, other indicators (e.g. equipment calibration, clean-up of overspray, use of non-chemical pest control methods) show little change. The absence of a trend in these indicators shows that factors other than the adoption of IPM approaches (e.g. budgetary constraints) may be the more significant in explaining the overall reduction in pesticide use. Indeed, toward the end of the current Permit term, only fifty-seven percent (57%) of the Permittees are able to report that they operate under a formal written IPM policy.

**Headline Indicator - Reduction in Pesticide Application:** During the 2004-05 reporting period, approximately 19,227 pounds of active ingredient of pesticides was applied by Permittees. This represents an approximately 30% decrease in pounds of pesticide applied compared to 25,022 pounds of active ingredient pesticides applied in 2003-04, and 24,750 pounds of active ingredient applied in 2002-03.

Level 3: Behavior Change

### **ROWD Commitment:**

- Develop Model Integrated Pest Management, Pesticide and Fertilizer Guidelines into a Model Program (rather than guidelines) with implementation goals and including model contract language.
  - Redefine IPM (pesticide use) indicators.
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### 5.3.3 Established BMPs

An annual evaluation of the routine preventive maintenance activities is conducted and, where appropriate, improvements or new practices are implemented to further reduce the amount of pollutants discharged into the storm drain system. An important component of this evaluation process is the documentation and collection of data related to these selected activities.

#### *Trash and Debris Controls (formerly Litter Control)*

There are currently three aspects to trash and debris control that have been reported over the period of the Third Term Permits, specifically, the deployment of trash and debris booms, public participation in Inner-Coastal and Watershed Cleanup Day, and an enhanced program of catchbasin cleaning.

Currently, eleven (11) trash and debris booms have been installed in flood control channels and harbors to recover floatable material. However, the Permittees recognize that the stormdrain infrastructure provides for retrofit opportunities in other areas. Indeed, a number of recent technical reports prepared by the Permittees and Coastal Commission examining technologies for trash and debris control, as well as extensive independent jurisdictional experience with inlet devices, establish a basis for the development of policy recommendations in this area.

#### **ROWD Commitment:**

- Develop recommendations for the selection and installation of drain inlet screens.

Every year the California Coastal Commission and Trails-4-All sponsor the Inner-Coastal and Watershed Cleanup Day to help cleanup the trash and debris that accumulates along the coastline, fouling the beaches and tidal zone. This event has been sponsored and heavily promoted by the Orange County Stormwater Program. In 2002, 1,722 volunteers joined in and collected 29,503 pounds of trash and 5,350 pounds of recyclables. In 2003, 2,473 volunteers collected 52,474 pounds of trash and 5,447 pounds of recyclables. In 2004, 6,001 volunteers collected 78,390 pounds of trash and 9,563 pounds of recyclables. In 2005, the number of clean-up sites increased to 43. The sustained year-to-year increases in public participation and material recovery point to the effectiveness of the Permittees' efforts in promoting this event.

Catchbasins are inspected annually and cleaned as appropriate. In the 2004-05 reporting period 86% of the catchbasin inventory in Orange County was cleaned, the highest level in the first three years of the Third Term Permits.

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### *Solid Waste Collection*

During the last reporting period, 35 Permittees reported the collection of nearly 4.0 million tons of solid waste. This effort compares to the total of 3.62 million tons of solid waste reported by 30 Permittees in 2003-04, 3.64 million tons of solid waste reported by 26 Permittees in 2002-03, and 3.70 million tons of solid waste reported by 33 Permittees in 2001-05. While the Permittees encourage the public, through education and outreach, to properly dispose of their trash, and this encouragement may be contributing to the increased level of collection in the most recent reporting period, there are significant discrepancies in the year-to-year reporting of individual jurisdictions.

**Headline Indicator - Solid Waste Collection:** 3,959,590 tons of solid waste was collected during the 2004-05 reporting period. This effort appears to represent a 9.1% increase in the amount of solid waste collected over the previous reporting period, an 8.8% increase over the reported total in 2002-03, and a 7.0% increase over the reported total in 2001-05.

In addition to education, the Permittees have considered the extent to which the cradle-to-grave management of solid waste can be improved to increase the effectiveness of collection efforts. This consideration has identified municipal oversight of contract solid waste collection and disposal as another area for possible improvements in service effectiveness.

### **ROWD Commitment:**

- Develop model language for municipal trash collection and haulage contracts that addresses water quality protection issues.

### *Drainage Facility Maintenance*

Drainage facilities are an integral component of the Model Municipal Activities Program and, as high priority facilities, subject to annual inspection. While the reported total length of drainage facilities has increased over successive years, the amount of material recovered has decreased. This reduction may reflect the increasing effectiveness of source controls and the impact of changing management practices such as street sweeping on concrete channels. However, both inconsistent year-to-year reporting and the profound influence of environmental variables (e.g. prevalence of Santa Ana wind conditions and severity of the wet season) may also be explanatory factors.

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**Headline Indicator - Drainage Facility Maintenance:** 5,612 tons of debris was removed from drainage facilities during the 2004-05 reporting period. This amount represents a 43% decrease in the amount of debris collected from drainage facilities when compared to the previous reporting period, a 77% decrease in the amount collected in 2002-03 and a 6.5% decrease in the amount collected in 2001-02.

### *Street Sweeping*

The year-to-year increases in the amount of material recovered from the urban environment by street sweeping suggest success regarding the Permittees' efforts to continue to improve the effectiveness (e.g. increasing use of drain inlet screens, regenerative air sweepers, parking controls etc.) of this maintenance practice.

**Headline Indicator - Street Sweeping:** 85,516 tons of material was removed from the streets and gutters during the 2004-05 reporting period. This effort appears to represent a 12% increase for weight of material collected over the previous reporting period and a 25% increase over the tons of material reported in 2002-03. This amount represents an 87% increase in the weight of material collected over the 2001-02 total, indicating increasing effectiveness in this area of infrastructure maintenance in the Third Term Permit cycle.

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**Table 5.1a: Current and Potential Outcome Levels (Municipal Activities)**

Model Municipal Activities Program	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
<b>Inventory</b>	✓ Maintain Inventory					
<b>Prioritization</b>	✓ Assign Priorities		✓ Change in prioritization level			
<b>Inspection</b>	✓ Conduct and track # of inspections		✓ # BMPs implemented	<sup>P</sup> Load reduction associated with BMPs		
<b>Training</b>	✓ Track number/type of training sessions	<sup>P</sup> Surveys show improved knowledge				
<p><u>Key:</u>                      ✓ = Currently Achieved Outcome Level  <sup>P</sup> = Potentially Achievable Outcome Level</p>						

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**Table 5.1b: Current and Potential Outcome Levels (Municipal Activities)**

Model IPM and Fertilizer Guidelines	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
<b>Model IPM</b>	✓ Formal Policy		✓ Reduction in pesticide use			
<b>Fertilizer Guidelines</b>	<sup>P</sup> Formal Policy		✓ Reduction in fertilizer use			
<b>Training</b>	✓ Track number/type of training sessions	<sup>P</sup> Surveys show improved knowledge				
<p><u>Key:</u>                      ✓ = Currently Achieved Outcome Level  <sup>P</sup> = Potentially Achievable Outcome Level</p>						

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## SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.2: Countywide Permittees' Fixed Facility Inventory and Prioritization

Permittee	Low 2002-03	Low 2003-04	Low 2004-05	Medium 2002-03	Medium 2003-04	Medium 2004-05	High 2002-03	High 2003-04	High 2004-05	Total 2002-03	Total 2003-04	Total 2004-05
Aliso Viejo	0	1	0	0	0	0	1	0	1	1	1	1
Anaheim	99	63	0	0	0	0	15	0	62	114	63	62
Brea	27	30	31	0	0		1	1		28	31	31
Buena Park	3	14	14	15	0	0	2	5	5	20	19	19
Costa Mesa	51	51	51	0	0		10	10	10	61	61	61
Cypress	17	14	14	8	8	8	1	1	1	26	23	23
Dana Point	14	13	13	0	0	0	8	9	10	22	22	23
Fountain Valley	28	28	28	0	0		1	1		29	29	28
Fullerton	90	94	94	0	0		1	1	1	91	95	95
Garden Grove	55	55	55	1	1	1	0	0		56	56	56
Huntington Beach	66	78	79	2	7	7	12	8	8	80	93	94
Irvine	39	39	44	12	12	12	1	3	3	52	54	59
La Habra	39	31	31	0	15	15	3	7	7	42	53	53
La Palma	1	1	2	1	1	1	2	2	1	4	4	4
Laguna Beach	46	46	46	48	45	46	73	75	74	167	166	166
Laguna Hills	0	0	0	0	0	0	20	20	20	20	20	20
Laguna Niguel	15	15	18	0	0		19	19	39	34	34	57
Laguna Woods	3	3	3	0	0		1	34	1	4	37	4
Lake Forest	7	0	0	0	0	0	0	8	9	7	8	9
Los Alamitos	14	14	14	NA	0	0	116	127	0	130	141	14
Mission Viejo	40	40	40	2	2	2	25	23	22	67	65	64
Newport Beach	20	21	21	1	1	1	4	4	4	25	26	26
Orange	27	26	29	25	29	29	2	2	2	54	57	60
Placentia	25	35	35	9	0		1	1	1	35	36	36
R S Margarita	3	0	4	0	0		669	669	669	672	669	673
San Clemente	73	20	73	0	19	0	17	51	17	90	90	90
S J Capistrano	18	18	18	0	0	0	38	38	38	56	56	56
Santa Ana	108	112	116	1	1	1	1	1	1	110	114	118
Seal Beach	32	32	39	0	0	0	3	3	5	35	35	44
Stanton	NA	19	19	NA	0	0	NA	1	1	NA	20	20
Tustin	24	22	22	0	0	0	4	4	4	28	26	26
Villa Park	0	1	1	0	0	0	2	1	1	2	2	2
Westminster	28	28	28	0	0	0	1	1	1	29	29	29
Yorba Linda	34	29	29	0	3	3	3	2	2	37	34	34
County of Orange	102	101	95	0	0	0	50	48	50	152	149	145
<b>TOTALS</b>	<b>1,148</b>	<b>1,094</b>	<b>1,106</b>	<b>125</b>	<b>144</b>	<b>126</b>	<b>1,107</b>	<b>1,180</b>	<b>1,070</b>	<b>2,380</b>	<b>2,418</b>	<b>2,302</b>

NA = Not Available

SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.3: BMP Implementation

PERMITTEE	FULLY Implemented 2002-03	FULLY Implemented 2003-04	FULLY Implemented 2004-05	PARTIALLY Implemented 2002-03	PARTIALLY Implemented 2003-04	PARTIALLY Implemented 2004-05	No BMPs Implemented 2002-03	No BMPs Implemented 2003-04	No BMPs Implemented 2004-05
Aliso Viejo	5	11	9	NA	0	0	NA	0	
Anaheim	147	52	65	NA	9	13	NA	0	
Brea	18	NA		0	NA	1	0	NA	
Buena Park	756	16	151	0	2	102	0	0	29
Costa Mesa	7	8	8	3	2	2	0	0	
Cypress	21	0		2	1	1	NA	0	
Dana Point	NA	NA	19	NA	NA	4	NA	NA	
Fountain Valley	79	51	53	2	0		2	0	
Fullerton	84	95	95	NA	0		NA	0	
Garden Grove	6	53	55	0	3	1	0	0	
Huntington Bch.	69	4	79	5	9	19	1	5	3
Irvine	54	54	59	0	0		0	0	
La Habra	0	1	29	4	2	26	NA	0	16
La Palma	1	1	1	3	3	3	0	0	
Laguna Beach	NA	NA	74	NA	NA		NA	NA	
Laguna Hills	16	20	35	2	0		0	0	
Laguna Niguel	NA	6	7	NA	12	29	NA	0	
Laguna Woods	3	6	3	1	7	3	NA	0	
Lake Forest	7	8	9	0	0		0	0	
Los Alamitos	NA	140	141	NA	1		NA	0	
Mission Viejo	23	23	28	26	44	25	18	0	
Newport Beach	8	19	19	0	7	7	0	0	
Orange	39	58	63	0	0		0	0	
Placentia	28	0		7	34	32	NA	0	
R S Margarita	672	669	673	0	0		0	0	
San Clemente	NA	NA		NA	NA		NA	NA	
S J Capistrano	54	56	37	0	0		0	0	
Santa Ana	NA	114	117	NA	0	1	NA	0	
Seal Beach	NA	NA		NA	NA		NA	NA	
Stanton	NA	20	19	NA	0	1	NA	0	
Tustin	NA	12	20	NA	31	23	NA	0	
Villa Park	0	0	0	2	2	0	0	0	1
Westminster	28	29	29	1	0		0	0	
Yorba Linda	2	29	14	0	15		0	0	
County of Orange	9	19	57	7	57	16	0	5	0
<b>TOTALS</b>	<b>2,136</b>	<b>1,574</b>	<b>1,968</b>	<b>65</b>	<b>241</b>	<b>309</b>	<b>21</b>	<b>10</b>	<b>49</b>

NA = Not Available

SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.4: 2004-05 Fertilizers and Amounts Applied By Permittee

Permittee	2002-03					2003-04					2004-05				
	Acres	Total N	Total P	N/acre	P/acre	Acres	Total N	Total P	N/acre	P/acre	Acres	Total N	Total P	N/acre	P/acre
Aliso Viejo	6.0	0.0	0.0			6.0	220.0	30.0	36.7	5.0	6.0	220.0	30.0	36.7	5.0
Anaheim	771.0	19,197.6	3,826.0	3,199.6	637.7	609.0	16,895.6	3,977.9	27.7	6.5	311.0	13,852.0	3,429.4	44.5	11.0
Brea	75.0	1,955.4	692.4	325.9	115.4	84.0	808.7	205.9	9.6	2.5	118.7	1,049.3	247.5	8.8	2.1
Buena Park	162.0	160.0	60.0	26.7	10.0	125.0	4,405.0	855.0	35.2	6.8	55.0	23,505.0	855.0	427.4	15.5
Costa Mesa	200.0	11,340.0	3,780.0	1,890.0	630.0	200.0	23,450.8	5,700.0	117.3	28.5	200.0	12,127.0	1,878.0	60.6	9.4
Cypress	69.0	420.0	140.0	70.0	23.3	69.0	23,450.8	5,700.0	339.9	82.6	9.0	210.0	70.0	23.3	7.8
Dana Point	50.0	4,800.0	720.0	800.0	120.0	50.0	4,800.0	720.0	96.0	14.4	50.0	960.0	360.0	19.2	7.2
Fountain Valley	200.0	1,017.5	405.0	169.6	67.5	200.0	2,441.0	1,183.0	12.2	5.9	200.0	2,441.0	1,183.0	12.2	5.9
Fullerton	50.0	3,397.5	1,672.5	566.3	278.8	120.0	4,911.5	1,408.5	40.9	11.7	NA	3,414.0	1,303.5	NA	NA
Garden Grove	160.0	2,771.8	1,343.4	462.0	223.9	170.0	4,095.0	1,335.0	24.1	7.9	170.0	5,265.0	1,712.5	31.0	10.1
Huntington Beach	596.0	25,178.6	4,932.6	4,196.4	822.1	606.0	25,133.6	4,887.6	41.5	8.1	606.0	25,133.6	4,887.6	41.5	8.1
Irvine	736.5	70,139.5	14,755.5	11,689.9	2,459.2	773.0	74,070.6	24,712.2	95.8	32.0	846.6	61,240.4	14,516.2	72.3	17.1
La Habra	108.0	3,080.0	1,030.0	513.3	171.7	108.0	2,943.5	889.5	27.3	8.2	108.0	2,474.0	942.0	22.9	8.7
La Palma	30.0	1,280.0	480.0	213.3	80.0	15.0	640.0	240.0	42.7	16.0	15.0	640.0	240.0	42.7	16.0
Laguna Beach	42.0	1,350.0	525.0	225.0	87.5	42.0	881.4	330.9	21.0	7.9	50.0	1,000.6	375.6	20.0	7.5
Laguna Hills	125.0	8,170.8	2,181.4	1,361.8	363.6	125.0	8,125.8	2,181.4	65.0	17.5	125.0	8,155.7	2,196.4	65.2	17.6
Laguna Niguel	151.0	33,079.5	11,461.1	5,513.2	1,910.2	151.0	37,929.2	18,528.2	251.2	122.7	151.0	20,737.5	5,763.7	137.3	38.2
Laguna Woods	15.0	642.5	145.5	107.1	24.3	5.0	497.5	142.5	99.5	28.5	5.0	510.0	210.0	102.0	42.0
Lake Forest	187.0	7,680.0	2,880.0	1,280.0	480.0	72.0	8,040.0	3,015.0	111.7	41.9	71.8	13,803.0	4,803.0	192.2	66.9
Los Alamitos						15.0	100.0	20.0	6.7	1.3	14.3	100.0	20.0	7.0	1.4
Mission Viejo	975.0	100,678.1	17,453.1	16,779.7	2,908.9	975.0	76,503.0	9,042.0	78.5	9.3	702.0	78,611.0	7,995.0	112.0	11.4
Newport Beach	300.0	5,967.0	2,837.0	994.5	472.8	170.0	4,095.0	1,335.0	24.1	7.9	300.0	4,800.0	2,760.0	16.0	9.2
Orange	243.4	21,479.0	3,646.0	3,579.8	607.7	190.0	6,233.5	1,560.3	32.8	8.2	243.0	6,506.2	1,478.5	26.8	6.1
Placentia	140.0	2,340.0	580.0	390.0	96.7	40.0	1,510.0	330.0	37.8	8.3	108.0	2,760.0	580.0	25.6	5.4
Rancho Santa Margarita						NA	NA	NA	NA	NA	0.2	8.0	3.0	40.0	15.0
San Clemente	151.0	13,217.5	3,132.5	2,202.9	522.1	305.0	16,492.5	3,990.0	54.1	13.1	180.0	10,200.0	2,800.0	56.7	15.6
San Juan Capistrano	173.0	6,562.0	1,704.4	1,093.7	284.1	176.0	4,771.1	1,079.0	27.1	6.1	176.0	3,606.0	1,072.5	20.5	6.1
Santa Ana	400.0	8,022.5	2,476.5	1,337.1	412.8	400.0	9,766.8	2,985.0	24.4	7.5	400.0	9,754.3	2,985.0	24.4	7.5
Seal Beach	10.0	0.0	0.0	0.0	0.0	55.0	320.0	120.0	5.8	2.2	55.0	320.0	120.0	5.8	2.2
Stanton						NA	NA	NA	0.0	NA	10.0	471.0	228.0	47.1	22.8
Tustin	160.0	5,679.5	1,022.5	946.6	170.4	160.0	3,105.0	612.5	19.4	3.8	184.0	1,065.0	75.0	5.8	0.4
Villa Park						2.0	0.0	0.0	0.0	0.0	10.0	400.0	200.0	40.0	20.0
Westminster	15.0	675.0	375.0	112.5	62.5	15.0	605.0	305.0	40.3	20.3	15.0	605.0	305.0	40.3	20.3
Yorba Linda	722.0	22,524.6	7,604.0	3,754.1	1,267.3	722.0	22,511.5	11,636.0	31.2	16.1	699.0	34,325.3	10,661.8	49.1	15.3
County of Orange	967.6	30,283.3	10,471.4	5,047.2	1,745.2	819.5	17,025.8	6,274.0	20.8	7.7	667.0	12,875.8	5,312.4	19.3	8.0
<b>Totals</b>	<b>7,990.5</b>	<b>413,089.2</b>	<b>102,332.8</b>	<b>68,848.2</b>	<b>17,055.5</b>	<b>7,574.5</b>	<b>406,778.9</b>	<b>115,331.5</b>	<b>1,898.1</b>	<b>566.2</b>	<b>6,861.6</b>	<b>363,145.6</b>	<b>81,599.5</b>	<b>1,896.3</b>	<b>462.6</b>

NA = Not Available

## SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.5: Volume of Street Sweeping Material Collected

PERMITTEE	Total Weight of Material Collected (Tons)* FY 2002-03	Total Weight of Material Collected (Tons)* FY 2003-04	Total Weight of Material Collected (Tons)* FY 2004-05
Aliso Viejo	96	120	110
Anaheim	4,500	4,500	4,500
Brea	800	800	1,179
Buena Park	1,830	1,475	1,475
Costa Mesa	1,730	1,810	1,846
Cypress	526	525	525
Dana Point	465	984	160
Fountain Valley	2,104	2,000	2,000
Fullerton	15,925	19,102	12,832
Garden Grove	NA	NA	2,940
Huntington Beach	3,282	3,434	3,516
Irvine	2,500	2,500	2,700
La Habra	7	5	5
La Palma	375	384	1,170
Laguna Beach	684	675	771
Laguna Hills	194	NA	315
Laguna Niguel	449	NA	423
Laguna Woods	3	62	14
Lake Forest	550	1,044	630
Los Alamitos	NA	3,500	
Mission Viejo	1,192	1,503	1,502
Newport Beach	4,044	4,150	28,800
Orange	11,880	12,000	3,000
Placentia	104	572	531
Rancho Santa Margarita	NA	12	92
San Clemente	1,164	1,177	523
San Juan Capistrano	525	605	676
Santa Ana	6,825	6,825	6,825
Seal Beach	2,085	2,084	
Stanton	NA	843	2,529
Tustin	874	904	1,025
Villa Park	89	134	135
Westminster	1,749	1,041	1,175
Yorba Linda	608	690	720
County of Orange/OCFCD	996	834	873
<b>Totals</b>	<b>68,155</b>	<b>76,294</b>	<b>85,516</b>

NA = Not Available

\*Tons=3 cubic yards per Michigan Department of Environmental Quality,  
Waste and Hazardous Materials Division

SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.6: Solid Waste Collection

PERMITTEE	Total Quantity of Solid Waste Collected 2002-03 (Tons)	Total Quantity of Solid Waste Collected 2003-04 (Tons)	Total Quantity of Solid Waste Collected 2004-05 (Tons)
Aliso Viejo	41,000	43,723	38,063
Anaheim	453,015	460,000	460,000
Brea	406,000	407,543	86,877
Buena Park	NA	80	100,000
Costa Mesa	287,090	279,850	186,753
Cypress	45,197	46,197	52,673
Dana Point	52,480	79,909	32,348
Fountain Valley	63,743	53,702	59,376
Fullerton	177,555	NA	187,385
Garden Grove	NA	NA	197,550
Huntington Beach	274,853	272,836	286,717
Irvine	295,000	292,600	287,500
La Habra	NA	31,043	37,000
La Palma	16,000	NA	18,000
Laguna Beach	48,390	58,550	47,700
Laguna Hills	43,783	39,803	56,031
Laguna Niguel	81,046	79,655	82,059
Laguna Woods	NA	23,000	25,000
Lake Forest	103,000	86,200	89,612
Los Alamitos	NA	NA	NA
Mission Viejo	105,600	108,000	108,252
Newport Beach	NA	39,992	40,000
Orange	234,040	210,836	215,400
Placentia	58,861	NA	63,000
Rancho Santa Margarita	NA	NA	63,356
San Clemente	85,339	85,339	88,956
San Juan Capistrano	68,417	76,166	81,652
Santa Ana	258,408	354,000	474,350
Seal Beach	45,292	45,000	26,136
Stanton	NA	35,004	41,500
Tustin	80,629	80,000	84,024
Villa Park	NA	10,200	10,500
Westminster	94,750	85,372	93,294
Yorba Linda	88,680	88,680	83,233
County of Orange/OCFCD	132,584	153,707	155,293
<b>Total tons of solid waste collected</b>	<b>3,640,752</b>	<b>3,626,987</b>	<b>3,959,590</b>

NA = Not Available

SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.7: Drainage Facility Maintenance

PERMITTEE	Total Length of Channel/Pipe Cleaned (in Miles)			Number of Catchbasins Within Jurisdiction			Number of Catchbasins Cleaned Within Jurisdiction			Percentage of Catchbasins Cleaned			Total Volume From Facilities (Tons)		
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
Aliso Viejo	0.23	0.24	0.24	625	625	625	625	625	625	100%	100%	100%	60.0	111.0	82
Anaheim	37.06	36.00	36	3,500	3,500	3,500	3,500	3,500	3,500	100%	100%	100%	1500.0	1500.0	1500
Brea	NA	NA	2.93	1,158	965	965	1,158	965	965	100%	100%	100%	50.5	50.0	50
Buena Park	0.01	2.25	2.25	20	857	758	20	28	949	100%	3%	125%	1.0	2.4	10.3
Costa Mesa	0.60	0.60	0.6	1,165	1,165	1,165	1,165	1,165	1,165	100%	100%	100%	25.0	25.0	20
Cypress	0.39	0.37	0.37	567	567	569	430	48	194	75%	8%	34%	2.0	0.5	1.5
Dana Point	0.03	0.00	0.29	430	555	526	386	446	459	90%	80%	87%	13.6	508.0	26.04
Fountain Valley	1.50	0.40	0.44	1,965	750	750	1,965	750	750	100%	100%	100%	422.0	217.0	281
Fullerton	7.82	5.90	6.5	1,255	1,322	3,424	3,268	2,216	3,424	50%	100%	100%	1697.0	1629.0	2.1
Garden Grove	0.01	0.01	0.01	907	907	936	907	907	936	100%	100%	100%	108.5	108.5	94
Huntington Beach	8.00	8.40	8.4	1,706	1,706	1,715	1,706	1,706	1,715	100%	100%	100%	934.4	894.9	687
Irvine	0.56	0.60	0.3	3,300	3,300	3,840	1,574	1,584	1,430	100%	48%	37%	14174.8	91.5	74.4
La Habra	NA	2.50	2.5	NA	545	545	NA	542	545	NA	99%	100%	NA	10.0	18
La Palma	5.00	4.70	5.2	201	201	201	201	201	201	100%	100%	100%	15.5	15.7	16
Laguna Beach	0.20	0.20	0.10	633	910	910	633	633	910	75%	70%	100%	227.9	NA	192
Laguna Hills	0.02	0.20	NA	521	515	487	481	304	472	92%	60%	97%	13.6	68.0	5.7
Laguna Niguel	0.73	0.20	0.6	NA	1,209	1,350	1,035	1,197	1,300	80%	99%	96%	1133.0	388.0	124
Laguna Woods	0.02	NA	NA	17	17	17	18	18	17	100%	100%	100%	0.2	NA	0.5
Lake Forest	0.00	0.00	0.03	438	483	1,082	200	331	1,042	47%	76%	96%	15.5	20.8	3.9
Los Alamitos	NA	NA		114	114	114	114	114	114	100%	100%	100%	DNR	15.5	15.5
Mission Viejo	0.02	0.02	3.63	1,800	1,830	1,830	360	651	781	10%	100%	43%	18.2	27.7	4.88
Newport Beach	1.45	3.33	3.33	2,853	3,057	3,087	2,551	2,733	3,087	89%	89%	100%	963.0	834.0	860
Orange	3.33	4.00	1.33	1,625	1,625	1,625	76	147	91	5%	9%	6%	1.9	2.0	12
Placentia	0.10	0.00	0	240	447	447	200	175	175	83%	39%	39%	7.8	0.5	0.5
Rancho Santa Margarita	NA	0.00	41.6	669	669	669	669	669	669	100%	100%	100%	NA	7.0	181.35
San Clemente	10.25	1.50	3.42	1,236	1,236	1,239	1,104	620	1,606	95%	50%	130%	NA	3.0	3
San Juan Capistrano	0.18	0.09	0.26	1,200	1,200	1,200	500	99	150	41%	9%	13%	37.0	28.0	45
Santa Ana	NA	2.10	10.1	1,500	1,270	1,665	129	1,175	1,586	9%	92%	95%	3058.0	3058.0	1042
Seal Beach	0.02	0.02	0.02	195	195	195	195	195	195	100%	100%	100%	4.5	16.8	32
Stanton	DNR	1.30	1.42	DNR	NA	145	DNR	142	145	DNR	99	100%	DNR	19.3	19.3
Tustin	NA	0.20	0.2	942	942	962	1,258	1,034	962	100%	>100%	100%	64.0	114.0	76
Villa Park	1.00	0.90	0.9	150	150	80	150	150	25	100%	100%	31%	NA	NA	70
Westminster	0.83	0.83	0.83	622	622	622	622	622	622	100%	100%	100%	6.0	5.0	5
Yorba Linda	1.06	1.06	0.8	1,550	1,575	1,728	1,500	1,575	1,728	97%	98%	100%	56.3	70.5	21
County of Orange/OCFCD	46.00	29.00	78	2,325	2,353	2,353	2,133	1,485	1,835	91%	63%	78%	52.0	36.0	36
Totals	126	107	213	35,429	37,384	41,326	30,833	28,752	34,370	83% (Ave.)	80% (Ave.)	86% (Ave.)	24,663	9,878	5,612

NA = Not Available  
DNR = Did Not Report

SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.8: 2004-05 Integrated Waste Management Household Hazardous Waste Program Collection Totals

Category	Type Of Waste	Collection Center Waste Volumes Collected (pounds)											
		Anaheim			Huntington Beach			Irvine			San Juan Capistrano		
		2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
<b>1. Flammable &amp; Poison</b>	Flammable Solid/Liquid	202,451	218,456	247,962	236,740	282,013	279,665	99,074	151,510	170,366	70,550	99,450	99,050
	Bulked Flammable Liquids	0	800	0	0	1,600	0	0	800	0	0	0	0
	Oil-Base Paint	346,307	395,469	512,372	327,172	347,123	387,257	213,166	247,271	249,331	162,400	245,700	221,260
	Poison (Excl aerosols)	38,301	50,713	64,974	47,496	53,486	58,972	27,172	39,395	41,169	16,650	16,650	27,720
	Reactive & Explosive	0	200	360	0	318	171	0	160	160	0	0	0
	<b>Subtotal</b>	<b>587,059</b>	<b>665,638</b>	<b>825,668</b>	<b>611,408</b>	<b>684,540</b>	<b>726,065</b>	<b>339,412</b>	<b>439,136</b>	<b>461,026</b>	<b>249,600</b>	<b>361,800</b>	<b>348,030</b>
<b>2. Acid</b>	Inorganic Acid	5,400	4,649	8,443	6,564	7,992	6,014	2,740	4,143	4,266	2,520	2,520	2,520
	Organic Acid	5,191	5,597	5,514	7,560	7,173	7,790	3,908	6,372	7,281	2,310	2,970	2,970
	<b>Subtotal</b>	<b>10,591</b>	<b>10,246</b>	<b>13,957</b>	<b>14,124</b>	<b>15,165</b>	<b>13,804</b>	<b>6,648</b>	<b>10,515</b>	<b>11,547</b>	<b>4,830</b>	<b>5,490</b>	<b>5,490</b>
<b>3. Base</b>	Inorganic Base	1,260	1,889	2,380	3,136	2,296	4,111	796	1,819	2,120	0	1,260	720
	Organic Base	7,555	10,117	4,070	10,168	12,282	13,802	3,810	6,896	7,462	2,640	4,950	2,310
	<b>Subtotal</b>	<b>8,815</b>	<b>12,006</b>	<b>6,450</b>	<b>13,304</b>	<b>14,578</b>	<b>17,913</b>	<b>4,606</b>	<b>8,715</b>	<b>9,582</b>	<b>2,640</b>	<b>6,210</b>	<b>3,030</b>
<b>4. Oxidizer</b>	Neutral Oxidizer	1,055	2,243	1,977	2,076	2,733	2,207	1,276	1,665	3,164	400	1,000	800
	Organic Peroxides	20	0	10	45	0	0	10	0	20	20	0	10
	Oxidizing Acid	0	94	136	1,240	504	1,186	10	29	30	0	0	0
	Oxidizing Base	0	171	115	0	414	1,167	136	421	166	0	0	0
	<b>Subtotal</b>	<b>1,075</b>	<b>2,508</b>	<b>2,238</b>	<b>3,361</b>	<b>3,651</b>	<b>4,560</b>	<b>1,432</b>	<b>2,115</b>	<b>3,380</b>	<b>420</b>	<b>1,000</b>	<b>810</b>
<b>5. PCBs (Containing)</b>	PCB Containing Paint	0	0	0	0	0	0	0	0	0	0	0	0
	Other PCB Waste	0	1,300	1,000	200	200	4,000	100	200	500	0	0	500
	<b>Subtotal</b>	<b>0</b>	<b>1,300</b>	<b>1,000</b>	<b>200</b>	<b>200</b>	<b>4,000</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>0</b>	<b>0</b>	<b>500</b>
<b>6. Aerosol</b>	Corrosive Aerosols	400	1,232	3,066	3,584	3,145	2,955	236	693	805	200	0	400
	Flammable Aerosols	22,760	28,106	35,258	35,741	39,875	48,539	16,101	24,101	26,364	10,450	11,525	14,250
	Poison Aerosols	1,810	4,033	5,592	7,196	5,903	7,685	2,128	4,338	5,161	800	1,200	100
	<b>Subtotal</b>	<b>24,970</b>	<b>33,371</b>	<b>43,916</b>	<b>46,521</b>	<b>48,923</b>	<b>59,179</b>	<b>18,465</b>	<b>29,132</b>	<b>32,330</b>	<b>11,450</b>	<b>12,725</b>	<b>14,750</b>

## SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.8: 2004-05 Integrated Waste Management Household Hazardous Waste Program Collection Totals (continued)

Category	Type Of Waste	Collection Center Waste Volumes Collected (pounds)											
		Anaheim			Huntington Beach			Irvine			San Juan Capistrano		
		2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
7. Reclaimable	Antifreeze	31,461	35,675	19,453	31,620	25,995	21,098	13,667	16,851	6,525	7,360	3,017	0
	Car Batteries	130,500	135,450	147,595	71,280	98,440	175,280	41,765	72,200	73,465	24,255	39,720	42,605
	Fluorescent Bulbs	3,000	3,800	3,400	4,400	4,600	4,600	1,200	3,200	3,400	600	1,200	1,800
	Latex Paint	268,300	349,243	379,840	315,558	358,846	410,495	159,584	269,382	294,413	135,090	97,470	182,400
	Motor Oil/Oil Products	157,833	169,939	179,892	131,309	123,238	123,193	72,121	88,387	93,325	43,275	49,062	39,975
	Oil Filters	5,000	4,600	5,800	4,600	4,000	4,000	2,200	2,600	2,600	1,000	1,400	1,000
	Mercury (Metallic)	80	120	100	78	100	200	54	80	250	0	40	150
	<b>Subtotal</b>	<b>596,174</b>	<b>698,827</b>	<b>736,080</b>	<b>558,845</b>	<b>615,219</b>	<b>738,866</b>	<b>290,591</b>	<b>452,700</b>	<b>473,978</b>	<b>211,580</b>	<b>191,909</b>	<b>267,930</b>
8. Other	Medical Waste	0	0	0	0	0	0	0	0	0	0	0	-
	Household Batteries	2,370	3,750	6,871	2,556	3,108	6,571	2,700	3,630	8,858	600	3,035	4,631
	Other	316,052	567,729	22,254	178,783	387,154	27,682	80,394	273,493	12,785	36,858	171,835	7,650
	<b>Subtotal</b>	<b>318,422</b>	<b>571,479</b>	<b>29,125</b>	<b>181,339</b>	<b>390,262</b>	<b>34,253</b>	<b>83,094</b>	<b>277,123</b>	<b>21,643</b>	<b>37,458</b>	<b>174,870</b>	<b>12,281</b>
9. Propane	Propane	NR	NR	28,060	NR	NR	36,613	NR	NR	94,039	NR	NR	5164
	CRT	NR	NR	427,976	NR	NR	323,695	NR	NR	273,539	NR	NR	190,971
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>456,036</b>	<b>0</b>	<b>0</b>	<b>360,308</b>	<b>0</b>	<b>0</b>	<b>367,578</b>	<b>0</b>	<b>0</b>	<b>196,135</b>
<b>Collection Center Totals</b>		<b>1,547,106</b>	<b>1,995,375</b>	<b>2,114,470</b>	<b>1,429,102</b>	<b>1,772,538</b>	<b>1,958,948</b>	<b>744,348</b>	<b>1,219,636</b>	<b>1,381,564</b>	<b>517,978</b>	<b>754,004</b>	<b>848,956</b>
Grand Total Collected for FY 2002-03 = 4,238,534													
Grand Total Collected for FY 2003-04 = 5,741,553													
Grand Total Collected for FY 2004-05 = 6,303,938													

NR = Not Reported

SECTION 5.0, MUNICIPAL ACTIVITIES

Table 5.9: Used Oil Grant Participation

PERMITTEE	Has or Participates in a Used Oil Grant	Amount Collected As a Result of the Used Oil Grant FY 2002-03		Amount Collected As a Result of the Used Oil Grant FY 2003-04		Amount Collected As a Result of the Used Oil Grant FY 2004-05	
		Motor Oil/Oil Products (Gallons)	Oil Filters (Units)	Motor Oil/Oil Products (Gallons)	Oil Filters (Units)	Motor Oil/Oil Products (Gallons)	Oil Filters (Units)
Aliso Viejo	X			NA	NA	63,647	27,109
Anaheim	No	135	74	0	0	NA	NA
Brea	X	900	165	720	144	31,680	3,867
Buena Park	X	NA	NA	9,495	NA	12,289	220
Costa Mesa	X	7,869	90	8,886	101	473	59
Cypress	X	NA	NA	43,000	0	75,000	NA
Dana Point	X	624	NA	28,930	NA	5,610	NA
Fountain Valley	X	1,834	27	74	15	147	28
Fullerton	X	15,840	35	50,856	132	79,942	NA
Garden Grove	X	31,837	1,154	19,471	NA	3,170	809
Huntington Beach	X	1,499	368	702	203	887	239
Irvine	X	71,784	NA	71,784	NA	59,645	NA
La Habra	X	NA	NA	7,630	NA	NA	NA
La Palma	No						
Laguna Beach	X	41	0	1,014	0	153	NA
Laguna Hills	X	DNR	DNR	NA	NA	44,800	11,000
Laguna Niguel	No	DNR	DNR	NA	NA	NA	NA
Laguna Woods	X	14,400	3,000	84	NA	25	6
Lake Forest	X	9,297	NA	NA	NA	63,614	NA
Los Alamitos	No						
Mission Viejo	X	12,145	147	14,280	NA	14,372	55
Newport Beach	X	NA	NA	19,471	NA		
Orange	X	2,966	NA	418	NA	2,158	554
Placentia	X	707	209	91	18	148	160
R S Margarita	X	NA	NA	NA	NA	33,544	133
San Clemente	X	19,455	2,500	19,455	2,500		
S J Capistrano	X	5,770	667	1,620	1,296	98,000	13,500
Santa Ana	X	5,804	3,815	12,037	3,698	12,583	4,004
Seal Beach	NA	NA	NA	NA	NA	NA	NA
Stanton	No	NA	NA	NA	NA	NA	NA
Tustin	X	NA	NA	NA	NA	NA	NA
Villa Park	No						
Westminster	X	64,100	NA	7,620	3,000	34,442	1,000
Yorba Linda	NA	NA	NA	NA	NA	NA	NA
County of Orange/OCFCD*	X	259,000	1,333	61,330	49,064	653,848	57,817
NA = Not Available		<b>526,007</b>	<b>13,584</b>	<b>378,967</b>	<b>60,171</b>	<b>1,290,177</b>	<b>93,451</b>

\* The number of gallons of used oil collected dropped in 2003-04 and then dramatically increased for 2004-05 due to CIWMB regulations in 2003-04 when the CIWMB stated that only the used oil turned in by do-it-yourselfers could be counted. However, for the 2004-05 reporting year, the CIWMB reversed their decision and allowed all used oil to be counted, including oil from HHCs and certified collectors (Jiffy Lube, etc.).

Figure 5.1: Countywide Permittees' Fixed Facility Inventory and Prioritization

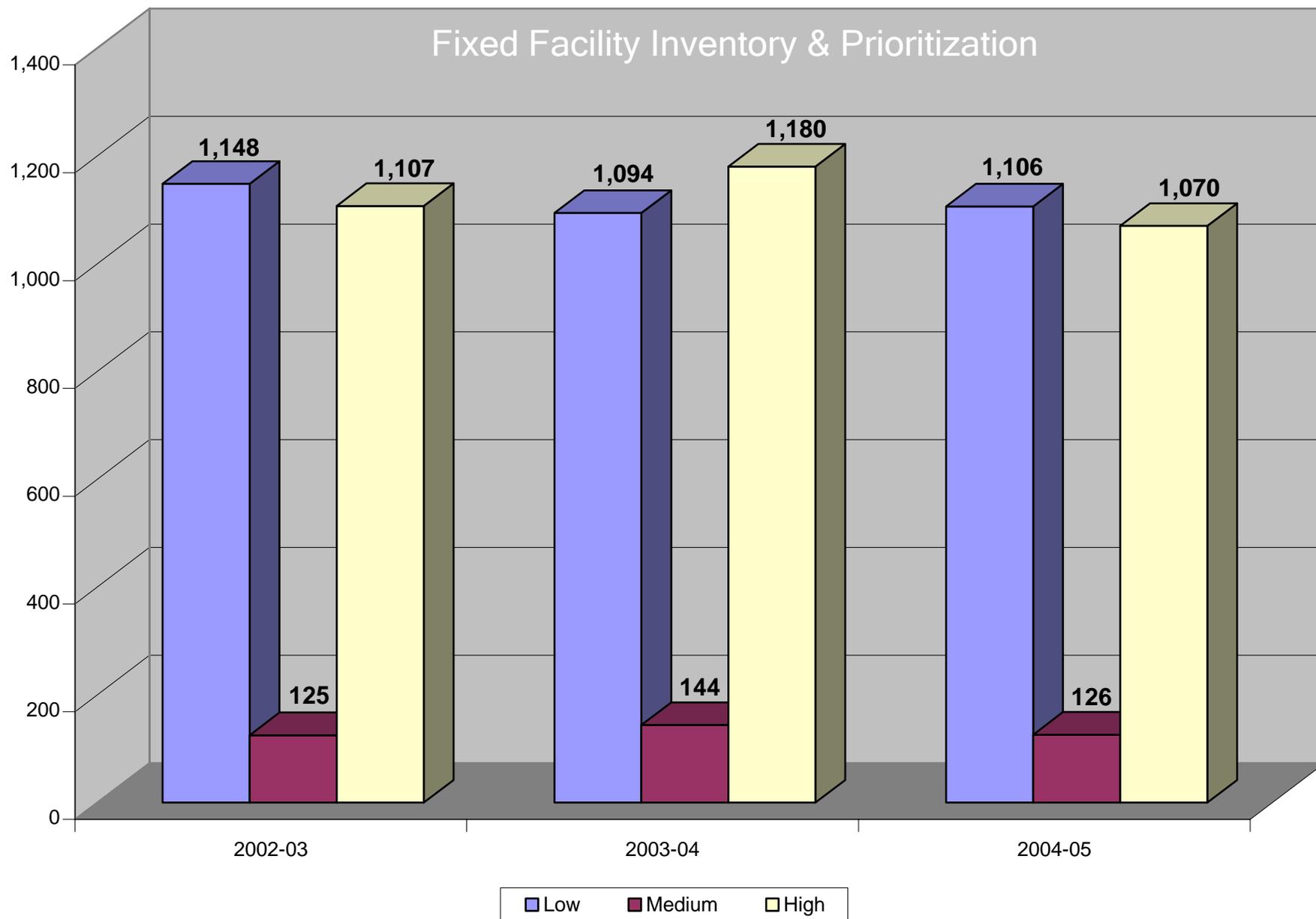


Figure 5.2: Volume of Street Sweeping Material Collected

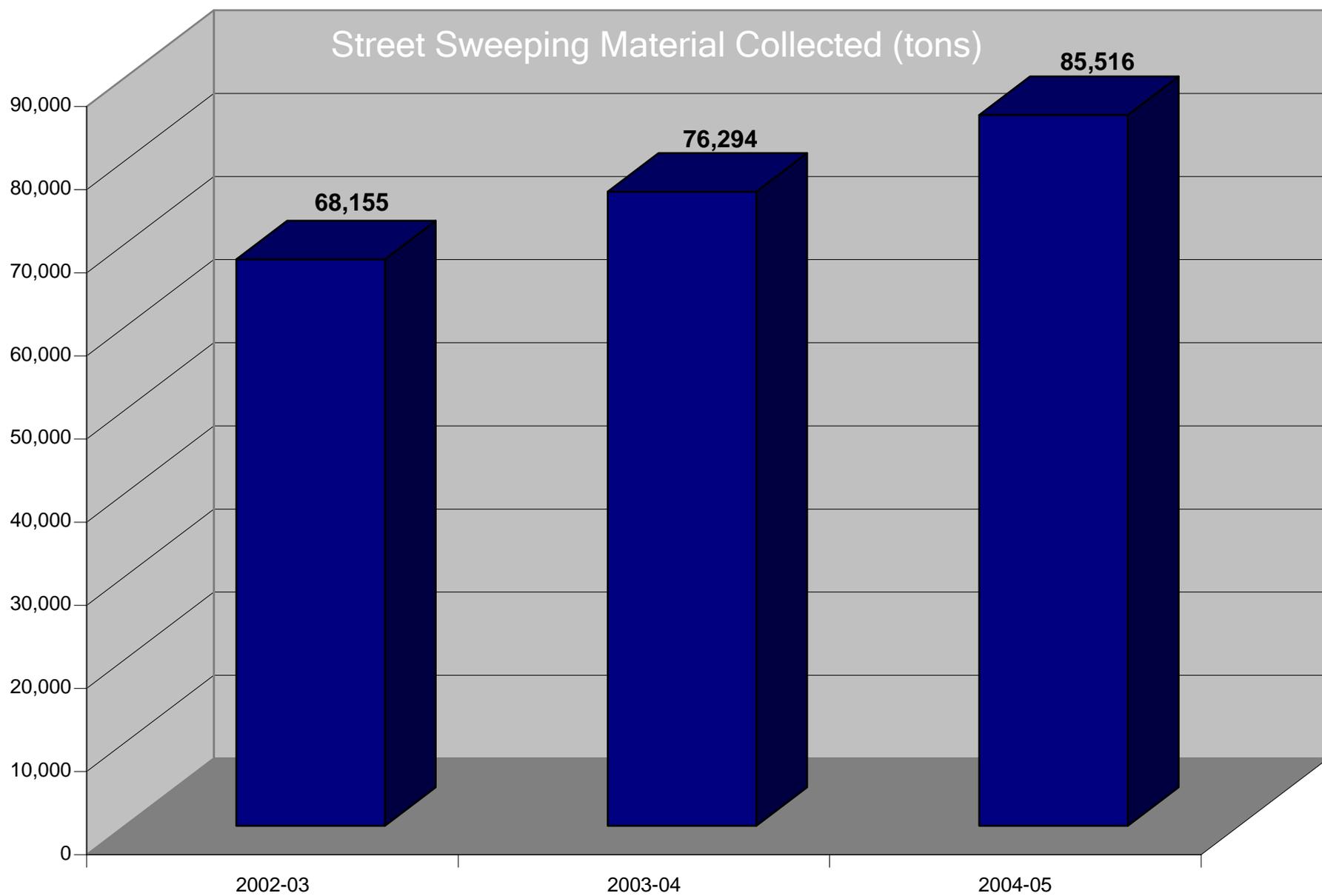


Figure 5.3: Solid Waste Collection (tons)



Figure 5.4: Drainage Facility Maintenance - Miles of Pipe Cleaned

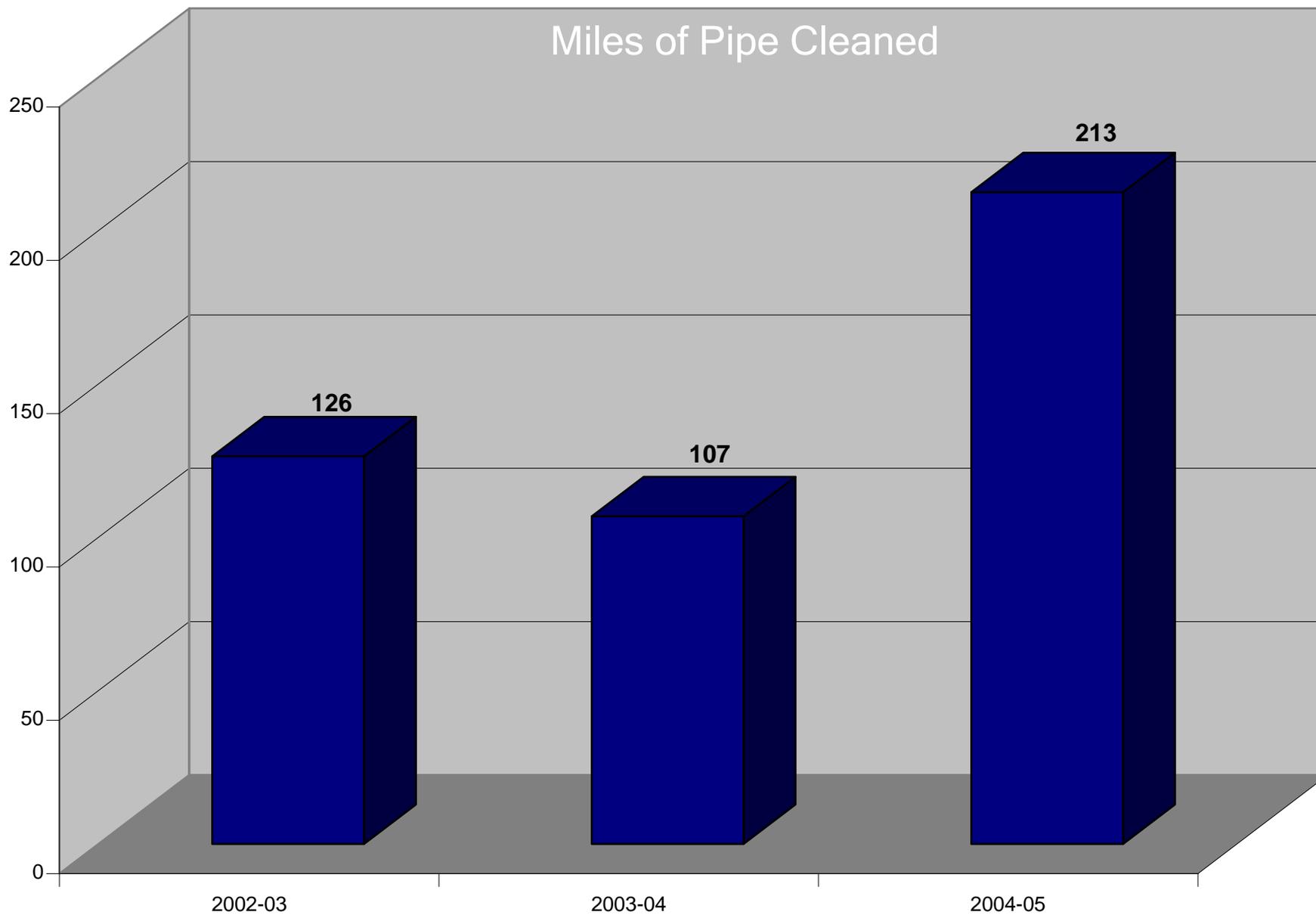
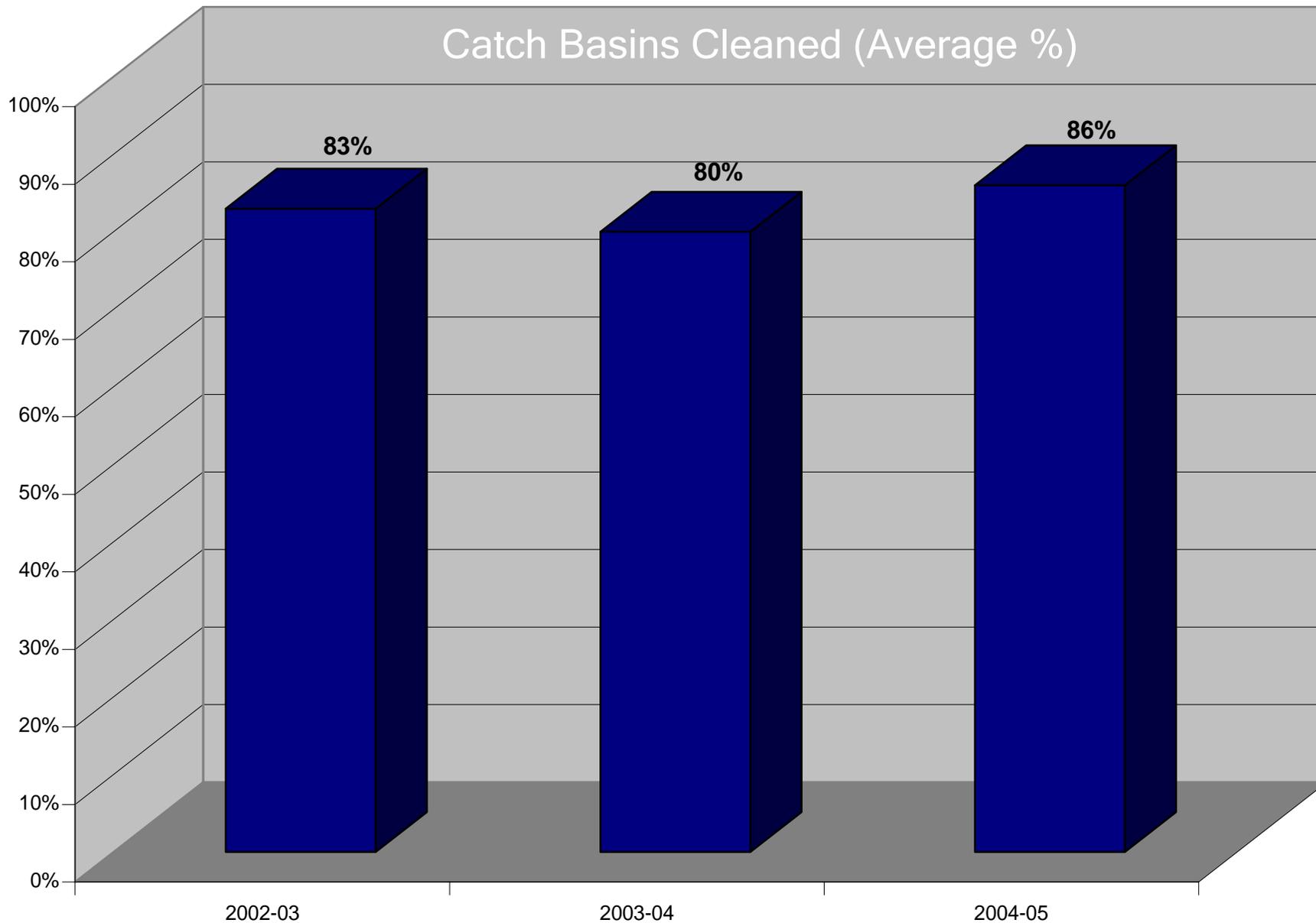


Figure 5.5: Drainage Facility Maintenance - Percentage of Catch Basins Cleaned



SECTION 5.0, MUNICIPAL ACTIVITIES

Figure 5.6: 2004-05 Integrated Waste Management Household Hazardous Waste Program Collection Totals

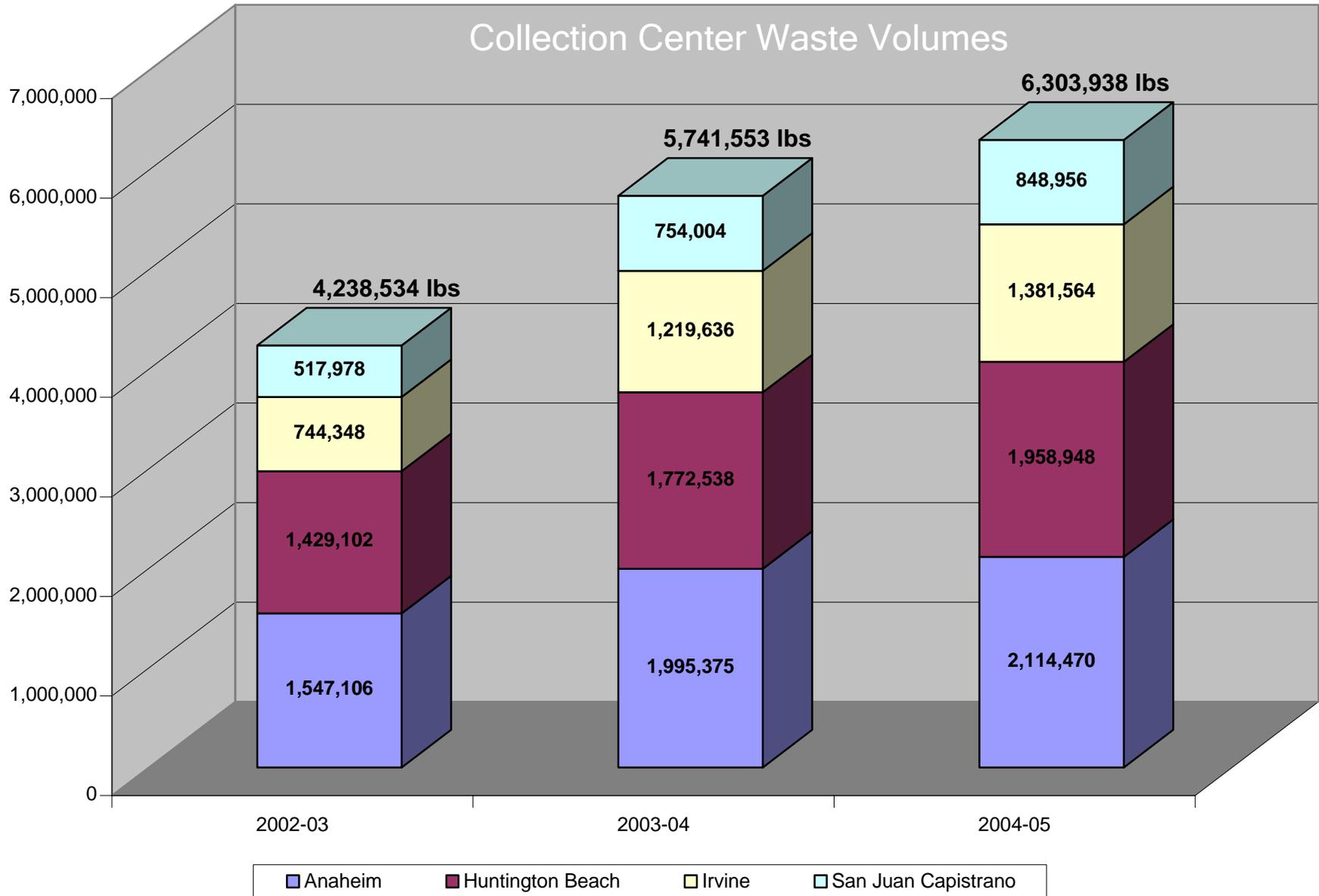
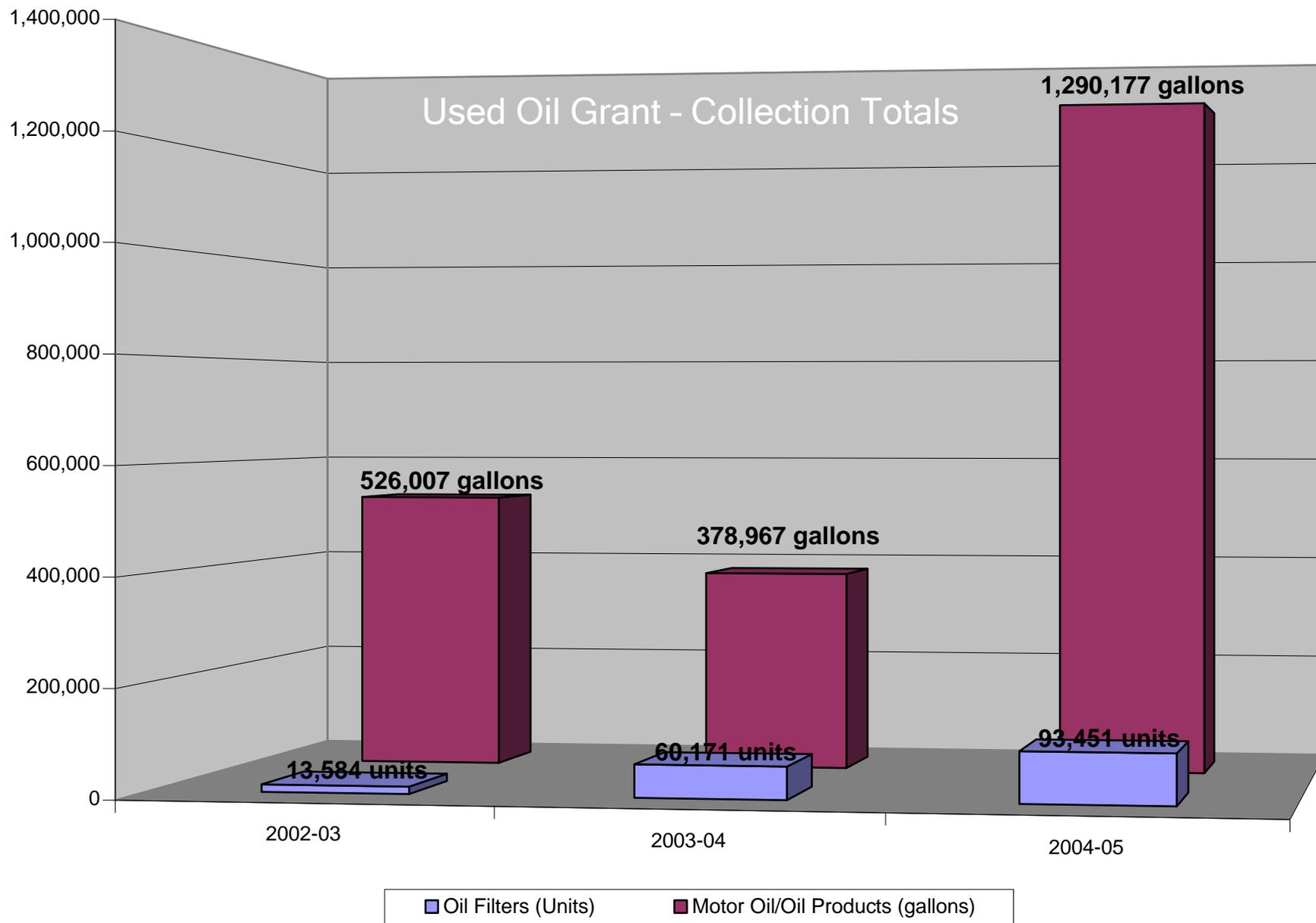


Figure 5.7: Used Oil Grant Participation



## 6.0 PUBLIC EDUCATION

### 6.1 Introduction

In 2002, the Permittees created a public and business outreach strategy - "Orange County Stormwater Public Education Program Recommendations." This strategy, which was updated in 2004, established a long-term, cost-effective approach to educate the public and targeted business groups about the effects of stormwater pollution and encourages their participation in the protection of surface waters. Key aspects of the strategy included conducting a survey to define the level of general knowledge held by people in Orange County, utilizing the survey results to develop campaign goals, determining the key messages, defining specific community outreach activities and approaches, preparing a master timeline, and creating a "brand" name for the Orange County Stormwater Program ("Project Pollution Prevention").

### 6.2 Accomplishments

The primary elements of the Third Term Permits public education program were a series of "Plans" that guided the program implementation, specifically:

- A "Materials Plan" that prioritized the educational materials necessary for revision/development and defined the common look and theme;
- A "Media Plan" that identified advertisement purchases in major publications, on Orange County Transit Authority buses and shelters, in movie theaters, on radio, and on cable television;
- A "Non-media Plan" which included the develop of a tool box for local outreach and building relationships with businesses, trade associations, chambers of commerce, utilities, and organizations that provided key opportunities for outreach;
- A "School Education Plan" to reach K-12 students in Orange County with pollution prevention messages; and
- An outreach plan for the approximate 10,000 food service facilities in Orange County.

Additional elements of the program include:

- An initial and follow-up public opinion/education survey (completed in 2003 and late 2005 respectively);
- Assistance with governmental and regulatory agency relations;
- Translation of all materials into Spanish and the creation of a Spanish webpage;
- Translation of key materials into Vietnamese;
- A "tool box" of materials for Permittee program coordinators to conduct local outreach efforts, based upon a quarterly "Quad Approach" including press releases, newsletter articles, fact sheets and billing inserts; and
- An employee-training program ("Stormwater 101") to educate all municipal employees about general stormwater principals.

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### 6.2.1 Countywide Public and Business Education Materials Plan

A Materials Plan was developed that prioritizes the outreach materials necessary for revision/development and defined a common look and theme. Pursuant to this plan, the following materials were produced:

- Forty-three brochures; 22 in English, 18 in Spanish and four in Vietnamese.
- Sixteen print advertisements; eight in English, seven in Spanish and one in Vietnamese.
- Ten radio public service announcements; five in English and five in Spanish.
- Four movie/cable PSAs; three in English and one in Spanish.
- Three bus advertisements.
- Six quad outreach kits including a newsletter, press release, billing insert and fact sheet.
- Outreach kit for food service establishments including a BMP poster, four stickers, a PowerPoint presentation, fact sheet and CD-ROM.
- Stormwater 101 training kit including a pre/post training evaluation, fact sheet, PowerPoint presentation and 7-½ minute video.
- A municipal vehicle magnet.
- A door hanger notice for residential pollution problem correction.

### 6.2.2 Media Outreach Plan

A strategic media relations campaign was developed and implemented that included advertisements in major publications, on Orange County Transit Authority buses and shelters, in movie theaters, on radio, on cable television and online. The Permittees collectively purchased the following media during 2002-06:

Newspaper advertisements generated 46.5 million impressions

- Seven full-color ads in the Sunday *Orange County Register*
- Three full-color ads in the Sunday *Los Angeles Times* (Orange County Edition)
- Twenty-two full-page ads in 17 of the *Register's* community papers
- Fourteen full-page ads in four of the *Register's* community papers
- Eleven ¾-page ads in the *Los Angeles Times'* three Orange County community papers: the *Daily Pilot*, *Huntington Beach Independent* and *Laguna Beach Coastline Pilot*
- Nine full-page ads in the *News-Enterprise*
- Fourteen full-page ads in *OC Metro*
- Eleven full-page ads in *OC Weekly*
- Seventeen full-page ads in *Miniondas* (Spanish language)
- Fifteen full-page ads in *Excelsior* (Spanish language)

Radio advertising generated 27.6 million impressions

- Twenty 60-second spots on KLAC AM 570. The spots generated more than 120,000 impressions.
- One hundred and twenty- 60-second spots ran on JACK FM 93.1 generating 25 million impressions.

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- One hundred and sixty 60-second spots ran on Sonido (Spanish language radio station) generating 2.5 million impressions.

OCTA bus advertising generated 71.5 million impressions

- Fifty-seven bus sides
- Fifty bus backs
- Fifty outdoor bus shelters

Movie theater advertising generated 11 million impressions

- The 30-second public service announcement ran on screen and in lobby kiosks for twenty weeks at 22 Edwards/Regal Cinemas, San Clemente's Krikorian Theater, twelve weeks at the Long Beach Town Center Theater and twelve weeks at AMC theaters.
- The sad fish poster was displayed at all 24 Orange County theaters.

Cable television advertising generated 1.4 million impressions on four cable stations (Adelphia, AT&T/Comcast, Time Warner and Cox Communications)

On-line banner advertising generated 2.35 million impressions

- Banner display on [www.931jackfm.com](http://www.931jackfm.com) for three months.
- Banner display on [www.ocregister.com](http://www.ocregister.com) for two months.

**Headline Indicator - Number of Media Impressions:** The public education program generated over 160,000,000 media impressions over the period 2002-06.

### **ROWD Commitment**

- Continue to "fine tune" the multi-media approach.
- Re-evaluate audiences & key messages for targeted behaviors.
- Pursue opportunities for regional collaboration.

### 6.2.3 Non-Media Outreach Plan

A Non-Media Outreach Plan was developed and implemented to complement the paid advertising media campaign. The plan utilized existing resources and partnerships to produce free or low-cost exposure for the program.

*Outreach to Permittees*

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The plan included the development of a “tool box” of materials to enable the Permittees to conduct local outreach both directly and indirectly through businesses, trade associations, chambers of commerce, utilities, restaurants and other organizations.

Specifically, the “tool box” included:

- Outreach Materials - Artwork was created for use on outdoor locations such as bus shelters, streetlight banners, mouse pads and beach towels.
- The Quad - A series of newsletters, press releases, fact sheets and billing inserts were created that focused on seasonal stormwater themes. Six seasonal quads were created.
  - Spring Into Cleaning – Household Hazardous Waste
  - What’s Summer Without The Beach
  - When It Rains It Pours Pollutants Into Our Storm drains
  - A Pollution Fix for 2006
  - Green Thumb Blue Ocean
  - Keeping Your Car and the Environment Sparkling Clean
- An Events Listing - Lists of upcoming utility, restaurant, city and organization sponsored events were developed where stormwater information could be provided to event participants.
- Employee Training Materials - Stormwater training materials were developed to educate all municipal employees about general stormwater pollution prevention principles.

### *Outreach to Businesses*

The plan’s proposed implementation of programs is based on relationships and partnerships that had been developed with groups who may have been receptive to partnering with the program..

- A list of key Orange County businesses that the Stormwater Program could potentially foster relationships with was developed. The list included top businesses and major Orange County employers. These businesses were contacted and the following is a list of the business partnerships developed:
- Point of Purchase - Partnerships with stores that sell auto supplies, hardware, pet supplies and gardening supplies were developed. The program has fostered relationships with:
  - PetsMart Inc.
  - Home Depot, Inc.,
  - Orchard Supply Hardware (OSH)
  - Wal-Mart,

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- The Pet Pantry
  - Huntington Garden Center
  - Flowerdale
  - De Nault's Hardware
- A list of major Orange County events such as the Orange County Auto Show and Southern California Home & Garden Show was created. Event coordinators were contacted with a letter introducing the program and asking for the opportunity to participate and/or distribute Orange County Stormwater Program materials.

### *Outreach to Utilities*

Major non-city utilities providing water, electricity, cable and refuse services were contacted and provided sample newsletters for use in their publications. Several utilities printed stormwater education materials in their newsletters and billing inserts and posted information on their websites including:

- Rainbow Disposal
- Waste Management
- Southern California Edison
- Sempra Energy/The Gas Company
- Orange County Water District
- Orange County Fire Authority

The four major refuse companies in Orange County agreed to place a 12" x 24" Stormwater magnet on their trucks. More than 500 refuse trucks displayed the magnet during the 2002-06 reporting period.

### *Outreach to Organizations*

A list of key Orange County organizations that the Stormwater Program could foster relationships with was developed. The list included organizations such as chambers of commerce, rotary clubs, and environmental groups.

- Chambers of Commerce - Several chambers provided Stormwater information to their members including the Brea Chamber of Commerce, Fountain Valley Chamber of Commerce, the Black Chamber of Commerce and the South Orange County Chambers of Commerce.
- Welcome Express - Welcome Express provides welcome packets to new homeowners in various communities throughout Orange County. Welcome Express provides the Household Tips brochure within their new homeowner's packet.

### *Media Relations Campaign*

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The media relations campaign centered on fostering relationships with reporters. Local newspapers are considered one of the most credible sources of information for Orange County residents and reach a large audience. Therefore, media relations were an invaluable component of the public education campaign.

The media relations campaign utilized the seasonal stormwater press releases created as part of "the Quad" to contact the media on a quarterly basis. The program also updated its media distribution lists quarterly.

**Indicator - Number of Non-Media Impressions:** The public education program generated 25 million non-media impressions during 2002-06.

### *Outreach to Restaurants*

A specific outreach plan for the approximate 10,000 food service facilities in Orange County was developed and implemented. The outreach plan included the following efforts:

- The inspection and distribution of educational materials to the approximately 10,000 existing food facilities (the inventory is updated annually) countywide. Over 36,000 inspections for NPDES stormwater related issues were conducted.
- A focused public education outreach component was developed and implemented. This effort included:
  - A mass mailing to all corporate and food service facilities within Orange County. Over 9,000 letters were mailed.
  - Distribution of focused educational brochures, posters, stickers and CD-ROMs were distributed during inspections.
  - Presentation was given to the Food Sanitation Advisory Council.

**Indicator - Number of Food Facility Outreach Impressions:** The public education program generated over 45,000 food facility outreach impressions during the 2002-06.

### **ROWD Commitment**

- Continue to foster new relationships and partnerships.

### 6.2.4 School Education Outreach Program

During the 2002-03, reporting period extensive meetings took place with representatives from

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various educational programs and agencies throughout Orange County. A school education outreach plan was developed and implemented that included the following partnerships:

### *Orange County Department of Education (OCDE)*

*Inside the Outdoors* is an environmental education program administered by the OCDE. There are three types of programs within *Inside the Outdoors* which are the:

- Outdoor Science School - This program includes information on sources of water for southern California, pollution prevention, and watershed information. 14,000 students participated in this program.
- School Program - A traveling scientist visits school sites providing the "Drip Drop" program - a 60-minute presentation about water quality. 3,000 students participated in this program.
- Field Program - Fifth grade students move into the real world of science and social science. During the "Where Do I Flow" program students learn about water pollution and prevention. 12,803 students participated in this program.

Approximately 30,000 students participated in the *Inside the Outdoors* Science Programs.

### *Municipal Water District of Orange County (MWDOC)/Discovery Science Center (DSC)*

The partnership with MWDOC/DSC is focused on the Elementary Water Science Education Program, a water education course for teachers, and a public program for general visitors.

- Elementary Water Science Education Program – This program presents grade-specific science lessons, which incorporate water sources, water conservation, and water/trash pollution themes complementary to the science content standards.

*5th Grade Student Assemblies:* This element of the program presents lessons to elementary school students in an assembly format. 17,200 fifth grade students and 500 fifth grade teachers participated in this program.

*5th Grade Students Attending the DSC Field Trip Program* - For 5<sup>th</sup> grade students attending the DSC, field trip instructors screen the Project Pollution Prevention video entitled "Go With the Flow" and distribute the Project Pollution Prevention water education-based booklet. 25,827 fifth grade students and 2,000 fifth grade teachers participated in this program.

- Water Education Course for Middle and High School Teachers - The Water Education Course provides fifth through twelfth grade teachers Professional Development classes complete with curriculum and a kit of scientific equipment to conduct water-focused and pollution awareness activities in their classrooms. The Water Education Course was provided to 24 teachers reaching approximately 792

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students.

- Public Program for General Visitors to the DSC - A demonstration and learning station for the general public visitors and students on field trips to the DSC was developed to further communicate the importance of water, water conservation, urban pollutants, and stormwater/urban runoff pollution. An estimated 76,000 visitors saw the station annually.

### *Project WET (Water Education for Teachers)*

The Project WET (<http://www.projectwet.org/index.html>) is a water science and education program for teachers that provide classroom ready teaching aids including the Project WET Curriculum and Activity Guide. The guide is a collection of hands-on, innovative, interdisciplinary activities. Project WET developed curriculum specifically for the stormwater program.

Nearly two hundred teachers have participated in Stormwater Program sponsored workshops reaching 7,000 students per year.

### *California Regional Environmental Educational Community (CREEC) Network*

The California Regional Environmental Education Community (CREEC) Network is an educational project whose mission is "to develop a communication network which provides educators with access to "high quality" environmental education resources to enhance the environmental literacy of California Students." It is an educational project supported by the California Department of Education, Environmental Education Program, in collaboration with state, regional and local partners. The CREEC Network provides information on all Orange County environmental school education outreach programs. To further publicize this information, links between the Permittees' website and CREEC were established.

<p><b>Indicator - Number of School Outreach Impressions:</b> The public education program generated 188,846 school outreach impressions during the 2002-06.</p>
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### 6.2.5 Other Countywide Initiatives

The Principal Permittee conducted a number of countywide public education initiatives on behalf of the Permittees. These initiatives included:

- Provision of brochures, magnets, bookmarks, manual, and posters to the Permittees, general public, businesses, schools, and other agencies. During 2002-06 over 450,000 educational materials were distributed.
- Management of the countywide 24-hr bilingual water pollution reporting hotline number, (714) 567-6363. During the 2002-06 the hotline received 927 water pollution calls. Water pollution complaints are also received through the County website.
- Advertisement of the 24-hour water pollution hotline number and web address, [www.ocwatersheds.com](http://www.ocwatersheds.com), in all SBC Regional Phone Directories.
- Management of the County website, [www.ocwatersheds.com](http://www.ocwatersheds.com). During 2002-06 the website received over 10,000,000 hits.

**Indicator - Number of Other Countywide Initiative Impressions:** The public education program generated 10,450,927 other impressions during the 2002-06.

**Headline Indicator - Public Education Program Impressions:** The public education program created over 195,684,773 impressions during the 2002-06 permit cycle. One of the goals of the public education program is to target 100% of the residents of Orange County. Orange County has a population of approximately 3 million people. Therefore, it can be deduced that every resident of Orange County received thousands of impressions during the reporting period. This achievement also far exceeds a Third Term Permit requirement to deliver a minimum of 10 million impressions per year within the Santa Ana Regional Board Area.

### 6.3 **Assessment**

In an effort to better understand the public's awareness regarding water quality issues, several surveys have been conducted. The surveys have incorporated a number of questions relating to pesticide, herbicide and fertilizer use, the sewer and storm drain system and the public's overall awareness of the County's public outreach campaign. Surveys conducted since the inception of the Orange County Stormwater Program include:

- 1994 Stormwater Pollution Prevention and Flood Awareness Survey
- 2000 County of Orange Fair Survey

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- 2000 Orange County Sanitation District Fair Survey
- LA Times In Education Survey
- 2001 Public Awareness Survey
- 2003 Public Awareness Survey
- 2005 Public Awareness Survey

### 6.3.1 Public Awareness Surveys

In May 2003, the Permittees conducted a large sample (1,500 respondents) public awareness survey to measure the current level of knowledge held by residents of Orange County. In November 2005, after 30 months of the public education campaign, a follow-up to the baseline survey was conducted. The purpose of the second survey was to assess the extent to which public opinion and knowledge about urban runoff issues have changed and whether Orange County residents have made any behavioral changes as a result of the public education campaign.

The findings indicate that the public information campaign on stormwater and urban runoff has made initial inroads towards increasing awareness. In the majority of questions, awareness of the program and or its elements increased one to three percentage points.

#### *Effectiveness of Educating on the Environmental Issue*

Consistent with findings from 2003, education, traffic congestion, safety and employment continue to rank higher than pollution as top issues of concern with Orange County residents. In the last 30 months, residents concern regarding pollution of the ocean, rivers, creeks and bays increased 1%. When asked specifically about ocean, bay and harbor pollution, concern remained consistent with the baseline data with 85% to 87% concerned. However, the intensity of concern regarding pollution of creeks and rivers increased 6% (from 39% very concerned in 2003 to 45% in 2005).

During the 30-month stormwater outreach campaign, information never focused on the actual quality of Orange County water or the severity of the issues. Most elements of the program focused on particular activities that would “protect our creeks, rivers, bays and ocean.” The result of the survey is consistent with the amount of prominence placed on this subject. If a greater emphasis was placed on this subject in the campaign, the numbers could have been higher.

#### *Effectiveness of Educating on the Storm Drain System*

Knowledge about urban runoff and storm drains has increased. In fact, 90% of residents know that water flowing in the street enters a storm drain and goes directly to a waterway. This is up six percentage points from 2003. However, there still is a lack of understanding regarding the storm drain system. When asked if water in the storm drains is tested and filtered, 4% more answered the question correctly in 2005, however, it was still less than half (46%) of the respondents. Similarly, when asked if sewer water and storm drain water

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enter the same system, 3% more answered the question correctly, however, it was still less than half (44%) of the respondents.

During the education campaign, nearly all materials created mentioned that objects in the street flow through storm drains directly to the nearest waterway. However, only the brochures, fact sheets and newsletter articles went into depth regarding the difference between the sewer and storm drain system. The use of this information in all the materials shows in the increased level of awareness. Had the differences between the sewer system and storm drain system been illustrated in every piece, these numbers may have been higher.

Also, men tend to be very knowledgeable regarding the storm drain system while women were less knowledgeable according to the 2005 survey; therefore, materials targeted at women may be considered.

### *Effectiveness of Educating on Key Pollutants*

The survey asked respondents if the following items contributed to polluting urban runoff: oil, toxic waste, Styrofoam cups, gardening products, cigarette butts, paint, dirty water/detergent, cleaning products, trash, pet waste, water from hoses, lawn clippings/dirt/leaves and pool water. In every case, respondents were very likely to say these items contributed to polluted runoff with nine of them increasing beyond the margin of error (oil, Styrofoam cups, cigarette butts, paint, cleaning products, trash, pet waste, lawn clippings/dirt/leaves and pool water).

The increased knowledge held regarding these 13 pollutants shows a strong upward trend and indicates that education materials are reaching the residents. For all but two pollutants (toxic waste and Styrofoam cups) a brochure has been created to educate the public. Also, seven of the pollutants (oil, gardening products, cigarette butts, dirty water/detergent, pet waste, hose water and lawn clippings/dirt/leaves) were covered in the print advertising campaign. The fact that public knowledge has increased regarding all 13 pollutants demonstrates that the education campaign is effective.

### *Effectiveness of Educating on Key Behaviors*

Consistent with the first survey, roughly two thirds say that changing their personal behaviors would make a difference in cleaning up pollution (65%). This represents an increase of 2%. The survey revealed the following: 97% of people were either willing or did dispose of chemicals properly, 89% were willing to or did use fertilizers properly, 92% were either willing to or did keep yard clippings out of the street, 90% were willing to or currently adjust sprinklers to avoid overwatering; 79% were willing to or did pick up after their pet, 90% were willing to or currently use a broom to clean driveways, and 73% were willing to or eliminated washing cars at home.

When comparing seven actions that residents were already participating in, they were 4% more likely to dispose of chemicals properly and 3% more likely to pick up after a pet in 2005. However, less respondents were keeping yard clippings out of the street (-5%),

adjusting sprinklers (-1%), using a broom instead of a hose (-5%), properly using fertilizer (-1%) and eliminating car washing (-9%). Although participation in some of the seven actions decreased, roughly half of Orange County residents report taking part in all seven of the activities – making a significant increase over the 30 months (+37%) of the campaign (**Figure 6.1**).

During the course of the education campaign, the materials focused on what can be done to prevent urban runoff. All seven activities mentioned in the survey were addressed in brochures, newsletter articles, fact sheets, press releases and billing inserts.

The survey results indicate that the education campaign has penetrated the residents of Orange County and caused significant awareness of the activities that can reduce urban runoff. In all cases (except home car washing) at least eight in ten residents were either participating, or willing to participate in, activities that limit runoff. Despite a successful start to the campaign, residents appear to be obstinate when it comes to one behavior – eliminating home car washing.

### *Effectiveness of the School Outreach Program*

A significant portion of parents of children under 19, roughly 25%, report that their children learned about urban runoff issues in school and came home and talked about it. It is safe to assume that the number of students who received the information, but did not share it with their parents is even higher.

Based on the significant number of students who have reported to a parent about having heard urban runoff prevention messages, it appears that the school outreach program has been effective.

### *Effectiveness of the Media Outreach Program*

According to the 2005 survey, the most effective (most recognized by residents) form of advertising are the “No dumping, drains to ocean” stencils (81%) and newspaper articles (65%). Although part of the overall stormwater program, stencils were not an integral element of the education campaign. Their success can be attributed to a couple of factors. First, the stencils are on a large percentage of storm drains throughout the County. Nearly every resident has a stencil in his or her neighborhood. Also, the stencil program has been active in Orange County for many years. While other education programs were introduced in the last 30 months, residents have seen the stencils for more than a decade. The other very effective program has been newspaper articles. Similar to the stencils, articles on water pollution have been available to the public for decades and have had time to resonate.

Other effective aspects of the program (recognized by residents) were the PSAs on radio (39%), PSAs on cable (38%), newspaper advertising (35%), brochures (28%) and community events (20%). All five of these programs were initiated 30 months ago through the outreach campaign and have significantly resonated with residents. While most of these campaign elements were specific to Orange County, a few had the additional assistance from other regional campaigns such as “Don’t Trash California” and the “Used

Oil" program.

Less effective aspects of the program (least recognized by residents) were movie theater advertising (14%), workplace information (14%), bus advertising (13%) door hangers (12%), and Spanish radio PSAs (6%). While Spanish radio was the least recognized program by all respondents to the survey, among Spanish speaking respondents it was substantially higher (18%). All of these specific campaign elements were created and implemented during the 30-month outreach campaign (**Figure 6.2**).

When determining whether an element should be eliminated from the campaign, it is important to evaluate the number of sources people received information from. According to the 2005 survey, 29% of people received stormwater information from one or two sources. If the majority of these people received information from a source that is eliminated, the campaign would be less effective. However, in this circumstance, only 2% of people who received information from one or two sources received information from theater ads or bus backs. In regarding to theater advertising, it is possible that residents confused cable PSAs with theater advertising because both played the same spot. Since cable advertising was highly recognized by residents, the campaign could have been less effective if it were removed. In the case of bus back advertising, the program would still have been effective without this element.

Another aspect of the program that was evaluated was the print advertising. While, 35% of people recalled seeing print advertising, it is important to note what papers residents are reading. While the largest percentage of advertising was in the Orange County Register, the program did advertise in the Los Angeles Times a half dozen times a year. According to the survey, the percentage of people who get most of their information on urban run-off from the Times dropped from 12% to 9% (Orange County Register is 28%). Also, only 5% of people who received information from one or two sources received the information from print advertising. Therefore, advertising in the Times could likely have been less frequent without affecting the effectiveness of the campaign (**Figure 6.3 Effectiveness of Print Advertising**).

According to the 2005 survey, the percentage of voters saying there is enough information has increased (+1% and +5% from a split question). However, residents continue to believe that there is not enough information provided about how to stop urban runoff and ocean pollution in Orange County. So while some of the elements of the campaign could have been eliminated, the survey demonstrated that people need to receive information from a variety of sources. The Internet appears to be an emerging source of information, increasing 6% to 10% (third highest source of information).

#### **6.4 Summary**

Since the inception of the Orange County Stormwater Program outreach campaign, information on stormwater and urban runoff has made initial inroads in increasing awareness. This increase is seen in nearly every element of the program and demonstrates a great beginning to a program that was implemented in a short period of time.

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Although all of the elements of the program contributed to the success of the campaign, the program could have considered eliminating bus back advertising. Print ads in the Los Angeles Times could have been reduced and ads in the full-run Orange County Register could have been increased. Another element that could have been added is online marketing. Overall the program demonstrated an effective start to the education campaign.

Figure 6.1: Resident Participation in Pollution Prevention Activities

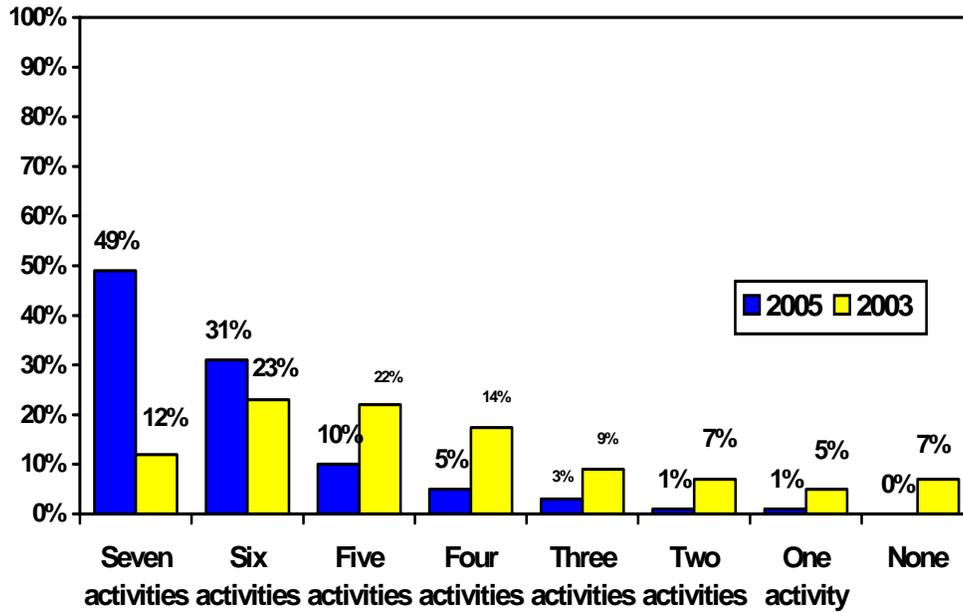


Figure 6.2: Effectiveness of Media Outreach Program

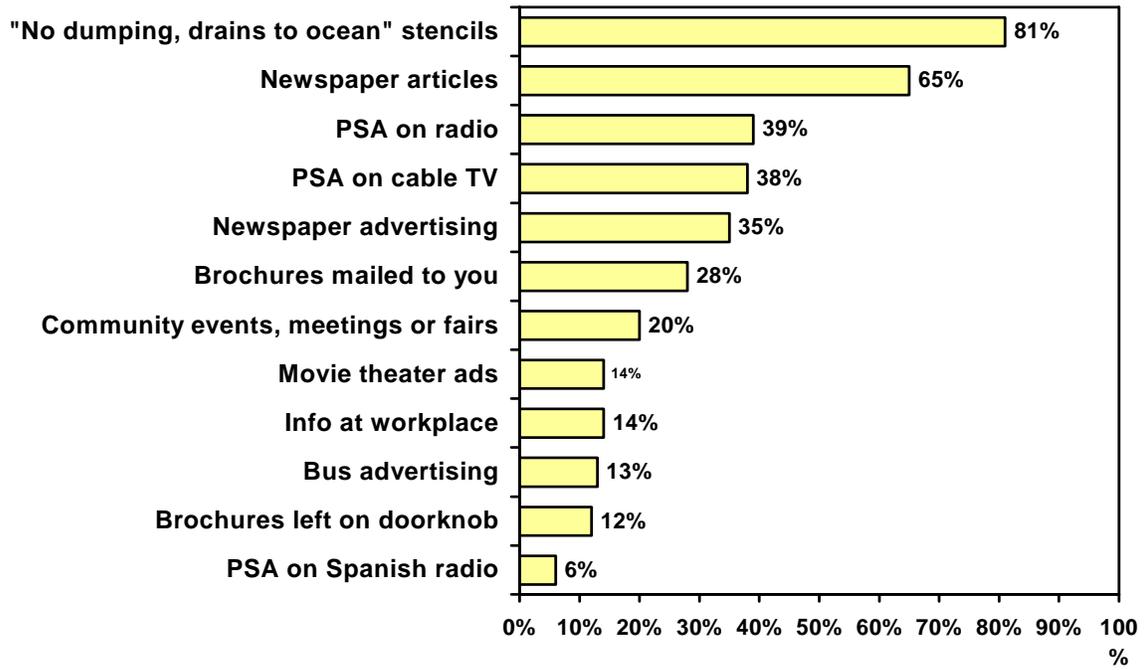
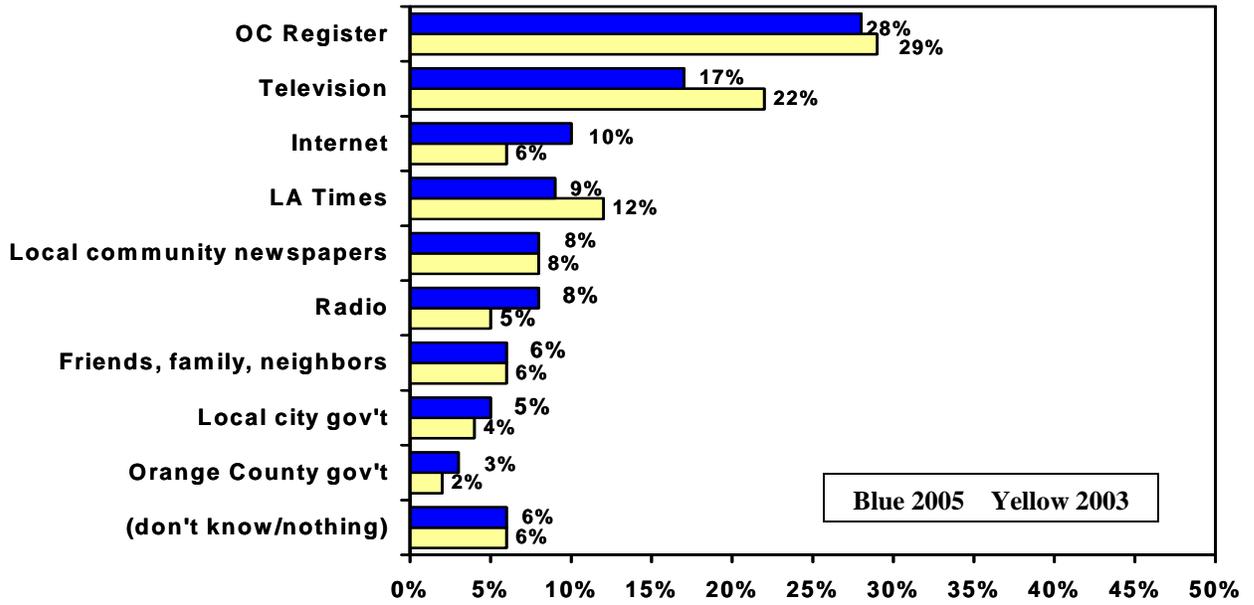


Figure 6.3: Effectiveness of Print Advertising



## 7.0 NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT

### 7.1 Introduction

One of the most important responsibilities of local government is to provide a decision making and approval processing framework for new development and re-development. This framework ensures that (1) development occurs in an orderly and organized fashion in a manner that reflects the vision and needs of the community, (2) environmental issues associated with development are assessed, and (3) provides a regulatory framework to ensure that standards set by the jurisdiction are implemented.

Since the inception of the Program, it has been recognized that the incorporation of BMPs into a development project in its planning stages offers a unique opportunity to limit increases in pollutant loads. **DAMP Section 7.0** links new development BMP design, construction and operation to the earlier phases of new development project planning, encompassed by the jurisdictional General Plans environmental review and development permit approval processes.

### 7.2 Accomplishments

#### 7.2.1 New Development/Significant Redevelopment Program

In 1993, the New Development/Construction Task Force, comprised of representatives from the Principal Permittee, Building Industry Association (BIA), Association of General Contractors (AGC) and Civil Engineers & Land Surveyors of California (CELSOC), completed a report - *Best Management Practices For New Development Including Nonresidential Construction Projects (1-5 acres)* - that provided the basis for requiring the incorporation of structural and non-structural BMPs into development. This report was the basis of the New Development component of the DAMP during the First and Second Term Permits.

The requirements of the Third Term permits significantly increased the complexity of the new development provisions of the DAMP. These provisions provide a framework and a process for integrating watershed protection/stormwater quality management principles into the Permittees' General Plans, environmental review processes, and development permit approval processes. The new development provisions also cover initial project planning and project design, construction and completion, including requirements for the selection, design and long-term maintenance of permanent BMPs. Specifically, the new development provisions require the Permittees to:

- Assess the need to revise and update General Plans to include watershed and stormwater quality and quantity management considerations.
- Review CEQA processes for potential stormwater quality impacts and mitigation.
- Review development planning/permit approval process for stormwater protection principles.

- Develop and implement a model Water Quality Management Plan (WQMP) (also referred to as a Standard Urban Stormwater Mitigation Plan – SUSMP) to address impact from new development and significant redevelopment.

For the area of Orange County within the San Diego Regional Water Quality Control Board jurisdiction of Orange County (area south of El Toro Rd.), each municipality was required by the Permit to develop a Local WQMP, based on the model WQMP, to oversee new development and significant redevelopment within their local jurisdiction. These Local WQMPs were finalized for implementation on August 13, 2003.

For the area of Orange County within the Santa Ana Regional Water Quality Control Board jurisdiction of Orange County (area north of El Toro Rd.), the Model WQMP explains the requirements placed upon all new development and significant redevelopment projects. The Model WQMP underwent a lengthy public review process and was approved for implementation by the Executive Officer of the Santa Ana Regional Water Quality Control Board on September 30, 2003.

During the 2004-05 reporting period, 551 Project WQMPs were processed for 3,227 acres of development. Since 1997, a total of 3,193 Project WQMPs have been approved, covering 27,287 acres which represents approximately 6% of the area within Orange County subject to the Third Term Permits.

- Conduct education or training.

Five training modules have been developed and have been given:

1. General Plan Issues;
2. New Development/Significant Program Management;
3. Project Planning and Design: Environmental Review, Planning and Permitting and WQMP Development;
4. Stormwater BMP Effectiveness and Applicability for Orange County, and
5. Stormwater Treatment: How it Works (Or Does It?).

#### 7.2.2 California Sustainable Watershed/Wetland Information Manager (CalSWIM)

CalSWIM (<http://calswim.org/>) is an Orange County Storm Water Program and University of California, Irvine (Departments of Engineering and Informatics) initiative to develop a web-based expert system and prototype database designed to support cost-effective and scientifically justifiable decisions regarding the monitoring, management, and alteration of coastal urban wetlands and their associated watersheds. Initiated in 2004, CalSWIM currently delivers:

- Forecasting and now-casting of nutrient levels, sediment supply, indicator bacteria, and pathogens in the Newport Bay Watershed, and

- Targeted evaluation of management decisions that affect the habitat quality and ecological function of coastal wetlands, and/or that directly bear on pollutants of concern.

### 7.2.3 Hydromodification

Hydromodification arises from changes in the volume, magnitude and duration of flows that can occur coincident with urbanization and is evident in the landscape as channel incision and bank erosion in the upper and middle portions of a watershed and as aggradation and increased channel meandering in the downstream areas of the watershed. In 2005, the Permittees supported, through the Stormwater Monitoring Coalition (SMC) and California Stormwater Quality Association (CASQA), a workshop that was convened to provide an overview of the key technical and managerial issues associated with hydromodification in S. California (see Stein and Zaleski, 2005<sup>1</sup>).

## 7.3 **Assessment**

The current and potential program effectiveness assessment outcome levels for the New Development / Significant Redevelopment Program are presented in **Table 7.1**.

### 7.3.1 New Development/Significant Redevelopment Program

CEQA review processes were reviewed for adequacy early in the period of the Third Term Permits. However, in preparing the ROWD, a number of Permittees commented that the overall planning approval process for projects needs to more effectively ensure that water quality protection is considered in the earliest phases of project consideration through further elaboration of the preliminary or conceptual WQMP concept in the DAMP.

#### **ROWD Commitment:**

- Prepare guidance documentation and clarify requirements for the preliminary or conceptual Project WQMP.

The Model WQMP identifies BMPs for new development and significant redevelopment projects that are subject to WQMP requirements pursuant to **DAMP Section 7**. Depending upon the project size and characteristics, these BMPs include Site Design BMPs, applicable Source Control BMPs and Project-based Treatment Control BMPs (and/or participation in an approved regional or watershed management program).

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<sup>1</sup> Managing Runoff to Protect Natural streams: The Latest Developments on Investigation and Management of Hydromodification in California; Stein and Zaleski, SCCWRP Technical Report 475, December 2000.

The requirement for new developments/significant redevelopment projects to prepare a WQMP has been an established part of the planning approval process (See **Table 7.2**) since the **1993 DAMP** and all Permittees certified they were implementing this part of the Program in 1997. While there is considerable variation in the level of activity between the Permittees, this variability can be attributed to the availability of land for development/redevelopment within a particular jurisdiction. Indeed, the County of Orange and the cities of Irvine and Anaheim, with large swathes of undeveloped land, show the highest numbers of WQMPs processed.

**Headline Indicator - Number of WQMPs processed and the area (acreage) to which BMPs have been applied:** During the 2004-05 reporting period, 551 WQMPs were processed for 3,227 acres of development compared to 461 WQMPs processed for 1,595 acres of development in 2003-04, and 391 WQMPs processed for 2,836 acres of development in 2002-03 (**Table 7.2; Figure 7.1**).

Level 1: Implement Program

**Headline Indicator - Number of BMPs Implemented:** A total of 5,061 BMPs were implemented in the 2004-05 reporting period. This total represents a 129% increase in the total number of BMPs implemented in 2003-04 (2,201) and a 112% increase from the total number of BMPs implemented in 2002-03 (2,389) (**Figure 7.2**).

Level 3: Behavior Change

During the Third Term Permit term, the structural source controls used most often were: common area efficient irrigation systems and landscape design, filtration, storm drain stenciling, and trash storage area. The non-structural source controls used most often include: employee training, common area litter control, common area landscape management, street sweeping, education, BMP maintenance, and activity restrictions. The most common treatment control BMPs that have been implemented include catch basin screens, catch basin filters, and stormwater treatment units (hydro-dynamic separators).

In preparing the ROWD, a number of Permittees have commented that (1) the guidance for selecting BMPs needs to be updated and enhanced, particularly with regard to treatment control BMPs, (2) there is a possible inconsistency in provisions regarding site prioritization, and (3) adjacent municipal stormwater programs have more effective provisions regarding the consideration of Site Design BMPs.

**DAMP Modification:**

- Revise *Model WQMP Table 7.II.6* for latest information on BMPs and clarity.
- Evaluate and revise (as necessary) prioritization provisions for Countywide consistency.

**ROWD Commitment:**

- Develop recommendations (through cooperative Stormwater Monitoring Coalition project) for incorporation of LID techniques into resource and water quality protection requirements.
- Develop library of BMP performance reports.
- Develop standard design checklist/plans/details for selected Source Control and Treatment Control BMPs.
- Develop recommendations for enhanced Model WQMP language regarding Site Design BMPs.
- Develop and implement BMPs for architectural uses of copper and zinc.

In 2005 the Santa Ana Regional Board formally approved the Irvine Ranch Water District's Natural Treatment System as a regional treatment control BMP for a portion of the Newport Bay Watershed. The project is significant for it being the first expression in the area under the jurisdiction of the Santa Ana RWQCB of a regional approach to stormwater treatment.

**ROWD Commitment:**

- Evaluate the NTS approval process and develop recommendations for streamlining regulatory agency approval of regional Treatment Control BMPs.

The New Development/Significant Redevelopment component of the Program ends with permit close-out and the BMPs transition to the Existing Development component. The Permittees believe that the BMP approach to stormwater management is most effectively sustained by ensuring the longevity of the WQMP through successive ownerships. Additionally, the Permittees requested additional guidance on recording WQMPs in a manner that would enable them to enforce the approved WQMP against subsequent property owners and ensure ongoing

responsibility for BMP maintenance.

**ROWD Commitment:**

Prepare guidance and training as needed on the recordation process (timing and appropriate documents to use) and develop recommendations for appropriate methods to employ to enable the Permittees to enforce the approved WQMP against subsequent property owners.

**Training:** Both the Permittees and RWQCB staff has identified a need for updated and additional training regarding WQMP review and approval.

**ROWD Commitment:**

- Prepare a training schedule and curriculum including defined expertise and competencies for staff with WQMP review and approval responsibilities.
- Prepare a workshop schedule and curriculum for the private sector on WQMP preparation.

7.3.2 California Sustainable Watershed/Wetland Information Manager (CalSWIM)

This initial development and deployment of CalSWIM has focused on Newport Bay, the regionally important tidal saltwater marsh. However, CalSWIM will in the future be extended with an open and scalable architecture to facilitate its rapid redeployment at other coastal urban wetland sites in southern California and elsewhere.

7.3.3 Hydromodification

While the major development projects in Orange County have now been entitled, the Permittees recognize that hydromodification is an emerging issue of concern as the future regulation and management of runoff from urban areas is increasingly considered with respect to the overarching objective of the CWA i.e. maintenance of the chemical, physical and biological integrity of the nation's waters.

**DAMP Modification:**

- Revise *Model WQMP Section 7.II -3.2.4 Identify Hydrologic Conditions of Concern* to incorporate additional information from hydromodification study.

**7.4 Summary**

The Third Term Permits have required the Permittees to develop and implement a significantly revised SUSMP- equivalent program for new development/significant redevelopment. This effort was completed Countywide by the end of 2003 and has resulted in an enhanced a WQMP program that, since 1997, has resulted in a total of 3,193 approved Project WQMPs. While the WQMP program is long-established, the review points to a possible continuing emphasis on pollution prevention BMPs and less progress regarding Site Design BMPs using LID approaches. Consequently, the development of additional training and technical support documentation on these approaches is being proposed as an area for further development. In addition, the Permittees have provisionally identified an opportunity, possibly through a Notice of Transfer of Responsibility, recordation, or other means, to enhance efficacy of the WQMP. This opportunity will be the future subject of a formal recommendation to the Permittees.

**Table 7.1: Current and Potential Outcome Levels (New Development/Significant Redevelopment)**

Development Program Component	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
<b>WQMPs</b>	✓ # of WQMPs approved		<sup>P</sup> # BMPs implemented	<sup>P</sup> Load reduction associated with BMPs		
<b>Training</b>	✓ Track number/type of training sessions	<sup>P</sup> Surveys show improved knowledge				
<p><u>Key:</u>                      ✓ = Currently Achieved Outcome Level  <sup>P</sup> = Potentially Achievable Outcome Level</p>						

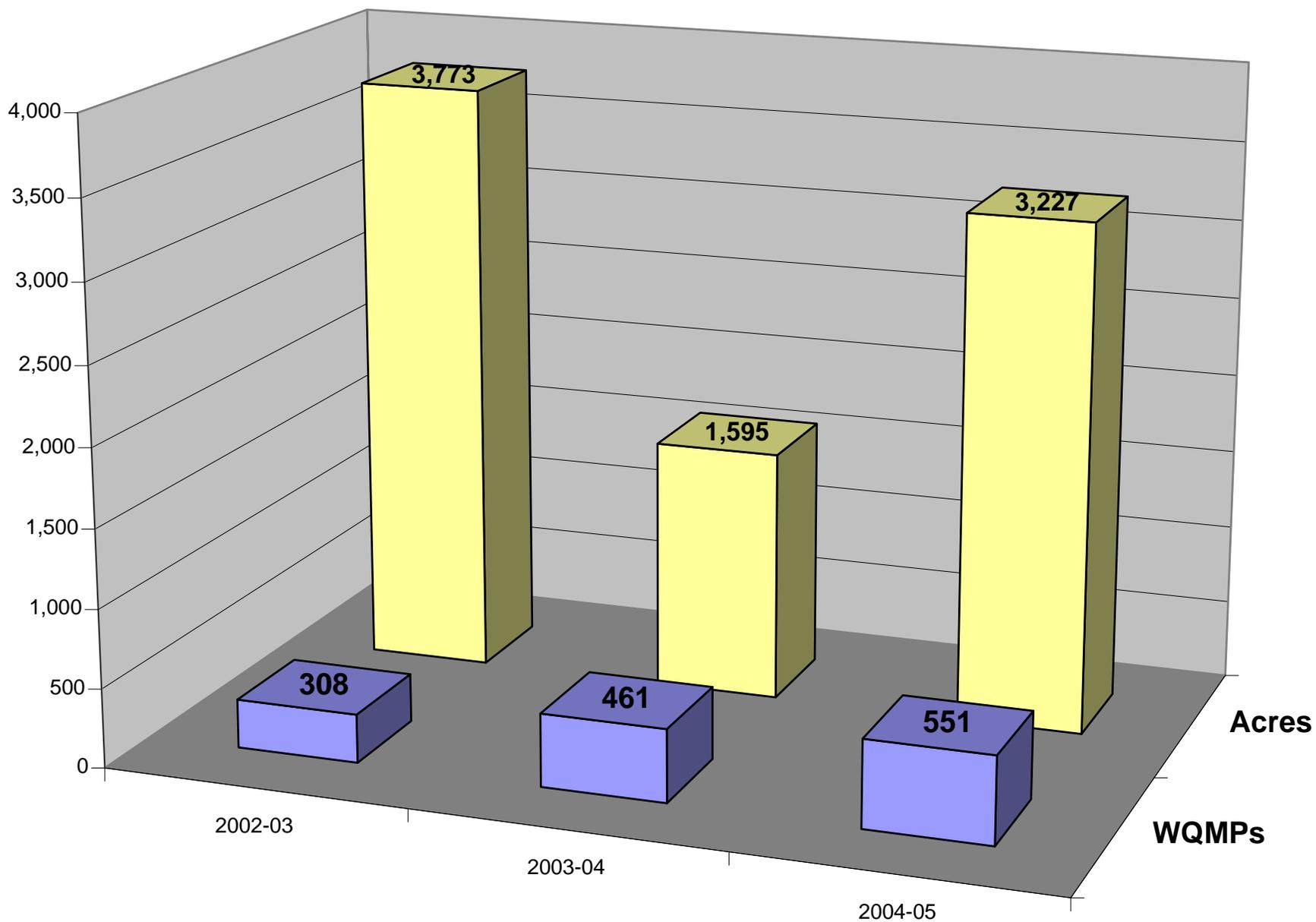
SECTION 7.0, NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT

Table 7.2: Historical WQMPs and Acreage Covered

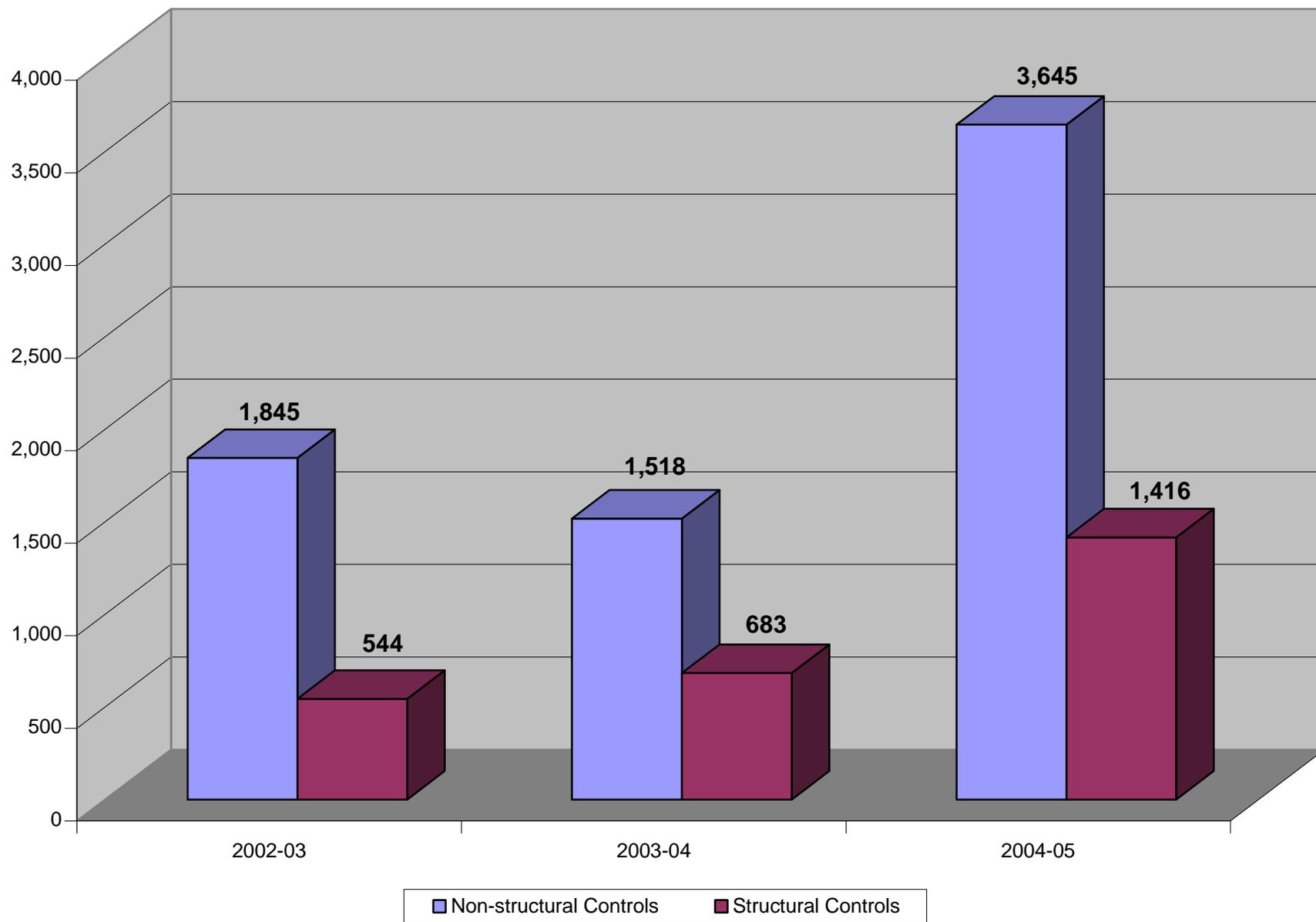
Permittee	2002-03		2003-04		2004-05	
	# of WQMPs Approved	Acreage Covered by WQMP	# of WQMPs Approved	Acreage Covered by WQMP	# of WQMPs Approved	Acreage Covered by WQMP
Aliso Viejo	1	23	3	NA	8	60
Anaheim	38	100	16	41	33	67
Brea	2	NA	5	NA	6	58
Buena Park	14	NA	8	NA	3	18
Costa Mesa	27	93	10	3	157	38
Cypress	11	14	22	NA	8	76
Dana Point	NA	NA	6	NA	1	121
Fountain Valley	5	37	2	NA	5	9
Fullerton	18	145	23	65	10	NA
Garden Grove	28	NA	21	NA	18	42
Huntington Beach	19	133	16	104	20	110
Irvine	87	NA	120	NA	100	485
La Habra	7	NA	0	0	2	1
La Palma	0	0	0	0	2	3
Laguna Beach	0	NA	11	NA	12	22
Laguna Hills	2	NA	6	NA	8	9
Laguna Niguel	2	NA	3	NA	1	21
Laguna Woods	NA	NA	4	NA	3	21
Lake Forest	16	40	7	26	4	8
Los Alamitos	0	0	4	NA	NA	NA
Mission Viejo	8	236	10	246	5	10
Newport Beach	NA	NA	18	NA	15	25
Orange	3	11	14	116	10	58
Placentia	0	NA	0	0	2	3
Rancho Santa Margarita	0	0	4	NA	4	4
San Clemente	10	277	22	146	4	329
San Juan Capistrano	8	85	10	NA	9	102
Santa Ana	19	61	23	NA	12	28
Seal Beach	0	0	2	NA	1	NA
Stanton	NA	NA	6	NA	7	3
Tustin	3	1	9	105	4	5
Villa Park	0	0	0	0	0	0
Westminster	8	8	15	17	13	10
Yorba Linda	6	145	14	234	20	187
County of Orange	49	1,426	27	491	44	1,294
<b>TOTALS</b>	<b>391</b>	<b>2,836</b>	<b>461</b>	<b>1,595</b>	<b>551</b>	<b>3,227</b>

NA = Not Available

Figure 7.1: Historical WQMPs and Acreage Covered



**Figure 7.2: Structural and Non-Structural Source Control BMPs Implemented**



## 8.0 CONSTRUCTION

### 8.1 Introduction

The Permittees regulate construction activities and have responsibility for the construction and reconstruction of municipal facilities and infrastructure. Concern over construction sites as a major source of sediment and other pollutants has meant that construction activity has been a focus of the Permittees' compliance program since the First Term Permits.

### 8.2 Accomplishments

#### 8.2.1 Model Construction Program

This Model Construction Program was developed and implemented in 2002-03. It requires all construction projects regardless of size to implement an effective combination of erosion and sediment controls and waste and materials management BMPs. It also establishes inspection obligations on the Permittees. Previously, the Permittees' oversight of construction activities was based upon ensuring conformance of public works projects with the *Greenbook Standard Specifications for Public Works Construction*. Specifically, the Model Construction Program requires the Permittees to:

- Inventory construction sites

In May 2002, a construction site inventory spreadsheet was finalized and distributed to the Permittees so that each municipality could develop their inventories by October 15, 2002, as required by Section VIII.1 of the 2002 Santa Ana Permit.

- Prioritize construction sites based upon water quality threat

During 2004-05, thirty-four (34) Permittees reported conducting 15,067 construction site inspections comprising 5,504 high priority site inspections, 1,542 medium priority site inspections and 8,021 low priority site inspections.

- Prepare BMP Guidance

The Permittees produced and distributed the *Construction Runoff Guidance Manual*.

- Conduct Inspections of construction sites

During the Third Term Permits 25,831, 25,549 and 15,067 site inspections were conducted in the 2002-03, 2003-04 and 2004-05 reporting periods respectively.

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- Undertake Enforcement

As a result of the 2004-05 inspections, thirty-three (33) Permittees reported the issuance of 445 Educational Letters, 1,052 Notices of Non-compliance, 74 Administrative Compliance Orders, 81 Cease and Desist Orders, and 47 Misdemeanor/Infractions.

- Conduct Training

To assist responsible municipal and contract/lease staff in understanding the Construction Program, two training modules have been developed:

- 1) Construction Program Management.
- 2) Inspecting Construction Site BMPs.

In the 2004-05 reporting period Construction Inspection training was provided in two sessions to 167 inspectors.

### 8.3 Assessment

The current and potential Program effectiveness Assessment Outcome Levels for the current program are summarized in **Table 8.1**.

#### 8.3.1 Model Construction Program

##### *Inventories*

The year-to-year status of the Permittees' inventories are not tracked at a Countywide level and consequently this aspect of the model program cannot be assessed.

##### *Prioritization*

The Permittees prioritize construction sites based upon a consideration of the size and type of construction, time of construction, location, and site topography. While the numbers of sites of each priority are not tracked at a Countywide level, the year-to-year changes in the level of inspection activity (**Table 8.2**) shows inconsistent reporting between the Permittees.

#### **DAMP Modification:**

- Provide definitive construction site prioritization and reporting guidance.

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### *Inspection*

The Permittees inspect construction sites to verify that the requirements of the DAMP are being implemented. The inspection frequency is determined by the season (“Wet” or “Dry”) and a site’s prioritization. The need for follow-up inspections also contributes significantly to the overall level of activity within a reporting period.

**Headline Indicator - Inspection Activity:** In 2004-05 thirty-four (34) Permittees completed 5,504 high priority, 1,542 medium priority, and 8,021 low priority construction site inspections. In 2003-04, 8,445 high priority, 5,731 medium priority, and 11,363 low priority construction site inspections were completed; and in 2002-03, 4,060 high priority, 15,937 medium priority, and 5,834 low priority construction site inspections were completed (**Table 8.2; Figure 8.1**).

Level 1: Implement Program

While the level of inspection activity is significant (15,000 inspections in the last reporting period) there are disparities between the Permittees which indicates inconsistent reporting. A major component of this activity is re-inspection following a finding of non-compliance. The Permittees believe that the re-inspection obligation is not sufficiently sensitive to the severity of the non-compliance, and RWQCB staff is concerned that the mandated level of follow-up activity may be discouraging findings of non-compliance.

### **DAMP Modification:**

- Clarify inspection frequencies, violation definitions and re-inspection requirements.

### *Enforcement*

Inspectors enforce compliance with the Model Construction Program, grading or building permit, sediment and erosion control plan, and the Water Quality Ordinance. Enforcement steps that may be taken by inspectors include but are not limited to verbal warnings, administrative actions under the Water Quality Ordinance (notice of violation, administrative compliance order, etc.) and written actions under Building/Grading Ordinances (corrective action notice, stop work order, etc.).

**Headline Indicator – Extent of Compliance:** As a result of the 2004-05 inspections, thirty-three (33) Permittees reported 1,514 construction requiring 1,521 re-inspections compared to 1,066 construction sites requiring 1,072 re-inspections in 2003-04; and 408 construction requiring 542 re-inspections in 2002-03 (**Table 8.3; Figure 8.2**).

Level 1: Implement Program

Level 3: Behavior Change

**Headline Indicator – Number and Level of Enforcement Actions:** As a result of the 2004-05 inspections, thirty-three (33) Permittees reported taking a total of 1,699 enforcement actions. This compares to 3,475 enforcement actions taken in 2003-04, and 1,395 enforcement actions taken in 2002-03 (**Table 8.4; Figure 8.3**).

Level 1: Implement Program

Level 3: Behavior Change

The significant disparities in enforcement activity between the Permittees clearly indicate inconsistent reporting. However, the consistent pattern of a peak of activity in 2003-04 and a subsequent reduction in the 2004-05 reporting period in construction and other stormwater program areas (Existing Development and Illegal Discharges/Illicit Connections) suggests an increased level of compliance within the regulated community.

#### *Training*

The Permits require that staff is adequately trained. In response, the Permittees developed two training modules and a guidance manual. However, the training modules need to be updated frequently enough to keep pace with the developments in the field of construction site sediment and erosion control management, and to provide inspectors with a technical understanding of BMPs. In addition, the training of inspectors regarding construction site inspection and oversight has been identified as a particular area of concern for Regional Board staff.

#### **ROWD Commitment:**

- Prepare a training schedule including curriculum content and defined expertise and competencies for construction inspectors.

#### **8.4 Summary**

The Third Term Permits have required the Permittees to develop and implement a formal inspection program commencing with an initial prioritized inventory of construction sites. Over the first three years of this effort, there has been a clear trend in the level of inspection and enforcement activity that, despite some uncertainties with respect to reporting, suggests increased BMP implementation and compliance with local water quality and grading/building ordinances by the regulated community. Based upon perceived positive outcomes of the Construction elements of the DAMP, the Permittees are proposing minor program modifications based upon the need for the continued training of inspectors and the sensitizing of the prioritization and inspection process toward a more risk-based approach.

Table 8.1: Current and Potential Outcome Levels (Construction)

Construction Program Component	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
<b>Inventory</b>	✓ Maintain inventory					
<b>Prioritization</b>	✓ Assign priorities		<sup>P</sup> Change in prioritization level			
<b>Inspection</b>	✓ Conduct and Track number of inspections	<sup>P</sup> Number of re-inspections	<sup>P</sup> # BMPs implemented	<sup>P</sup> Load reduction associated with BMPs		
<b>Enforcement/ Reporting</b>	✓ Conduct enforcement		✓ Extent and correction of problem level of enforcement			
<b>Training</b>	✓ Track number/type of training sessions	<sup>P</sup> Surveys show improved knowledge				
<p><u>Key:</u>                      ✓ = Currently Achieved Outcome Level  <sup>P</sup> = Potentially Achievable Outcome Level</p>						

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Table 8.2: Construction Site Inspections Comparison of 2002-03, 2003-04 and 2004-05

PERMITTEES	Number of Sites Inspected								
	HIGH 2002-03	HIGH 2003-04	HIGH 2004-05	MEDIUM 2002-03	MEDIUM 2003-04	MEDIUM 2004-05	LOW 2002-03	LOW 2003-04	LOW 2004-05
Aliso Viejo	2	3	2	51	51	1	53	0	39
Anaheim	3	0	0	51	27	48	138	839	850
Brea	0	4	3	20	10	6	9	8	36
Buena Park	0	0	2	20	9	15	180	19	590
Costa Mesa	30	19	15	0	0	0	2,223	5,974	522
Cypress	1	2	5	0	1	0	7	9	1
Dana Point*	NA	16	24	NA	4	8	NA	1,077	182
Fountain Valley	25	5	6	0	0	0	163	353	87
Fullerton	84	17	1	3	34	0	30	67	10
Garden Grove	0	9	0	0	0	0	56	17	49
Huntington Beach	25	3	59	123	66	165	376	422	320
Irvine	132	67	114	1	41	99	2	63	175
La Habra	0	0	0	12	1	1	560	353	360
La Palma	25	0	6	123	0	0	376	5	0
Laguna Beach	1	1	2	32	47	111	0	0	0
Laguna Hills	210	183	209	0	0	0	0	0	0
Laguna Niguel	1	14	34	7	0	0	304	109	1,398
Laguna Woods	34	7	1	0	0	3	27	4	0
Lake Forest	4	2	1	21	9	13	18	5	1
Los Alamitos	0	0	NA	0	1	NA	0	292	NA
Mission Viejo	1,869	2,570	1,100	2,040	506	495	0	0	0
Newport Beach	4	3	2	54	23	0	162	270	648
Orange	3	7	7	20	40	37	563	193	153
Placentia	0	1	1	3	6	4	8	5	5
Rancho Santa Margarita	0	0	0	0	2	2	24	0	269
San Clemente	NA	34	276	NA	120	163	NA	0	0
San Juan Capistrano	1,304	199	48	12,595	4,674	300	0	0	400
Santa Ana	0	0	0	73	29	41	63	51	68
Seal Beach	NA	2	1	NA	0	0	NA	975	1,612
Stanton	NA	2	4	NA	0	4	NA	0	25
Tustin	5	6	13	1	7	4	49	56	4
Villa Park	0	0	0	0	0	0	127	166	175
Westminster	18	5	5	4	0	0	8	11	22
Yorba Linda	2	7	10	23	23	22	14	20	20
County of Orange/OCFCD	278	5,267	3,553	660	**See explanation below	**See explanation below	294	**See explanation below	**See explanation below
<b>Totals</b>	<b>4,060</b>	<b>8,455</b>	<b>5,504</b>	<b>15,937</b>	<b>5,731</b>	<b>1,542</b>	<b>5,834</b>	<b>11,363</b>	<b>8,021</b>

NA = Not Available

\*includes undetermined amount and different categories

\*\* the database system the County uses to track construction inspections does not differentiate between high, medium, and low priority construction sites; therefore, all sites are classified as "high" priority.

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Table 8.3: Inspection Results, Comparison of 2002-03, 2003-04 and 2004-05

PERMITTEES	2002-03		2003-04		2004-05	
	Number of Construction Sites Out of Compliance	Number of Re-Inspections Due to Non-Compliance	Number of Construction Sites Out of Compliance	Number of Re-Inspections Due to Non-Compliance	Number of Construction Sites Out of Compliance	Number of Re-Inspections Due to Non-Compliance
Aliso Viejo	27	27	45	33	21	21
Anaheim	4	4	55	14	33	48
Brea	1	1	0	0	2	3
Buena Park	0	0	5	5	29	15
Costa Mesa	2	3	NA	NA	0	0
Cypress	NA	NA	1	1	2	2
Dana Point	NA	NA	NA	NA	98	105
Fountain Valley	56	56	43	43	4	4
Fullerton	8	12	105	105	8	2
Garden Grove	3	3	4	4	1	1
Huntington Beach	54	130	23	39	150	54
Irvine	3	3	33	40	35	35
La Habra	14	17	18	18	68	81
La Palma	0	0	0	0	1	2
Laguna Beach	NA	NA	NA	NA	68	68
Laguna Hills	2	3	7	8	9	9
Laguna Niguel	14	26	24	24	23	23
Laguna Woods	1	1	0	0	6	6
Lake Forest	2	2	0	0	7	7
Los Alamitos	0	0	0	0	NA	NA
Mission Viejo	57	61	67	69	137	139
Newport Beach	0	0	NA	NA	67	75
Orange	0	0	7	7	8	8
Placentia	5	5	5	5	6	6
Rancho Santa Margarita	0	0	0	0	8	5
San Clemente	NA	NA	161	161	NA	NA
San Juan Capistrano	50	50	56	84	49	72
Santa Ana	13	23	7	7	12	22
Seal Beach	NA	NA	21	21	NA	NA
Stanton	NA	NA	0	0	2	8
Tustin	19	67	0	0	7	40
Villa Park	0	0	0	0	0	0
Westminster	1	2	5	10	5	12
Yorba Linda	7	6	4	4	6	6
County of Orange/OCFCD	65	40	370	370	642	642
<b>Totals</b>	<b>408</b>	<b>542</b>	<b>1,066</b>	<b>1,072</b>	<b>1,514</b>	<b>1,521</b>

NA = Not Available

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Table 8.4: Enforcement Action Taken, Comparison of 2002-03, 2003-04 and 2004-05

PERMITTEES	FY 2002-03					FY 2003-04					FY 2004-05				
	Administrative Remedies				Criminal Remedies	Administrative Remedies				Criminal Remedies	Administrative Remedies				Criminal Remedies
	No. of EL/VW	No. of NON	No. of AC	Number of C&D Orders	Misdr, Infrct	No. of EL/VW	No. of NON	No. of AC	Number of C&D Orders	Misdr, Infrct	No. of EL/VW	No. of NON	No. of AC	Number of C&D Orders	Misdr, Infrct
Aliso Viejo	0	0	27	6	0	0	0	32	7	0	0	0	51	43	0
Anaheim	0	0	2	0	0	55	0	0	0	0	6	0	0	0	0
Brea	15	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Buena Park	0	0	0	0	0	0	3	1	1	0	0	63	0	6	0
Costa Mesa	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0
Cypress	0	4	0	0	0	1	10	0	0	0	1	4	0	0	0
Dana Point	2	32	0	0	1	7	36	0	3	0	29	61	3	5	0
Fountain Valley	400	4	21	6	0	27	12	15	9	0	168	0	5	2	0
Fullerton	0	5	1	0	0	51	44	0	5	0	NA	NA	NA	NA	NA
Garden Grove	2	1	0	0	0	3	4	0	0	0	0	1	0	0	0
Huntington Beach	0	16	1	1	0	0	23	1	0	0	0	80	0	0	24
Irvine	0	3	0	0	0	33	0	0	0	0	35	35	0	0	0
La Habra	0	14	0	0	0	0	18	0	0	0	52	7	2	6	0
La Palma	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Laguna Beach	54	14	37	0	1	23	23	29	0	0	24	31	13	0	0
Laguna Hills	0	3	0	0	0	4	3	0	0	0	1	5	0	0	0
Laguna Niguel	0	26	0	0	0	0	24	0	0	0	0	14	0	0	0
Laguna Woods	2	0	0	0	0	0	0	0	0	0	8	8	0	0	0
Lake Forest	NA	NA	NA	NA	NA	0	0	0	0	0	0	2	0	0	0
Los Alamitos	4	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA
Mission Viejo	NA	NA	NA	NA	NA	238	93	0	0	0	0	21	0	0	0
Newport Beach	6	250	200	0	0	558	618	315	0	0	0	2	0	0	1
Orange	0	0	0	0	0	7	7	0	0	0	0	8	0	0	0
Placentia	0	5	0	1	0	0	0	1	0	0	0	1	0	1	0
Rancho Santa Margarita	0	0	0	0	0	0	0	0	0	0	9	5	0	1	0
San Clemente	1	2	0	1	0	142	71	7	33	0	34	20	0	11	21
San Juan Capistrano	50	50	0	0	0	50	6	0	0	0	8	35	0	6	0
Santa Ana	0	13	0	0	0	0	7	0	0	0	0	3	0	0	0
Seal Beach	NA	NA	NA	NA	NA	41	41	0	0	0	0	19	0	0	0
Stanton	NA	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0	0
Tustin	0	19	0	0	0	0	0	0	0	0	0	0	0	0	1
Villa Park	15	0	0	0	0	12	0	0	0	0	0	0	0	0	0
Westminster	0	1	0	0	0	10	0	0	0	0	0	12	0	0	0
Yorba Linda	0	3	0	4	0	327	4	0	0	0	0	6	0	0	0
County of Orange/OCFCD	0	65	0	0	0	5	372	0	0	0	70	607	0	0	0
<b>Totals</b>	<b>554</b>	<b>531</b>	<b>289</b>	<b>19</b>	<b>2</b>	<b>1,597</b>	<b>1,419</b>	<b>401</b>	<b>58</b>	<b>0</b>	<b>445</b>	<b>1,052</b>	<b>74</b>	<b>81</b>	<b>47</b>

NA = Not Available

EL/VW = Educational Letter/Verbal Warning

AC = Administrative Compliance Order

Misdr./Infrct = Misdemeanor/Infraction

NON = Notice of Non-Compliance

C&D = Cease and Desist

Figure 8.1: Construction Site Inspections Comparison of 2002-03, 2003-04 and 2004-05

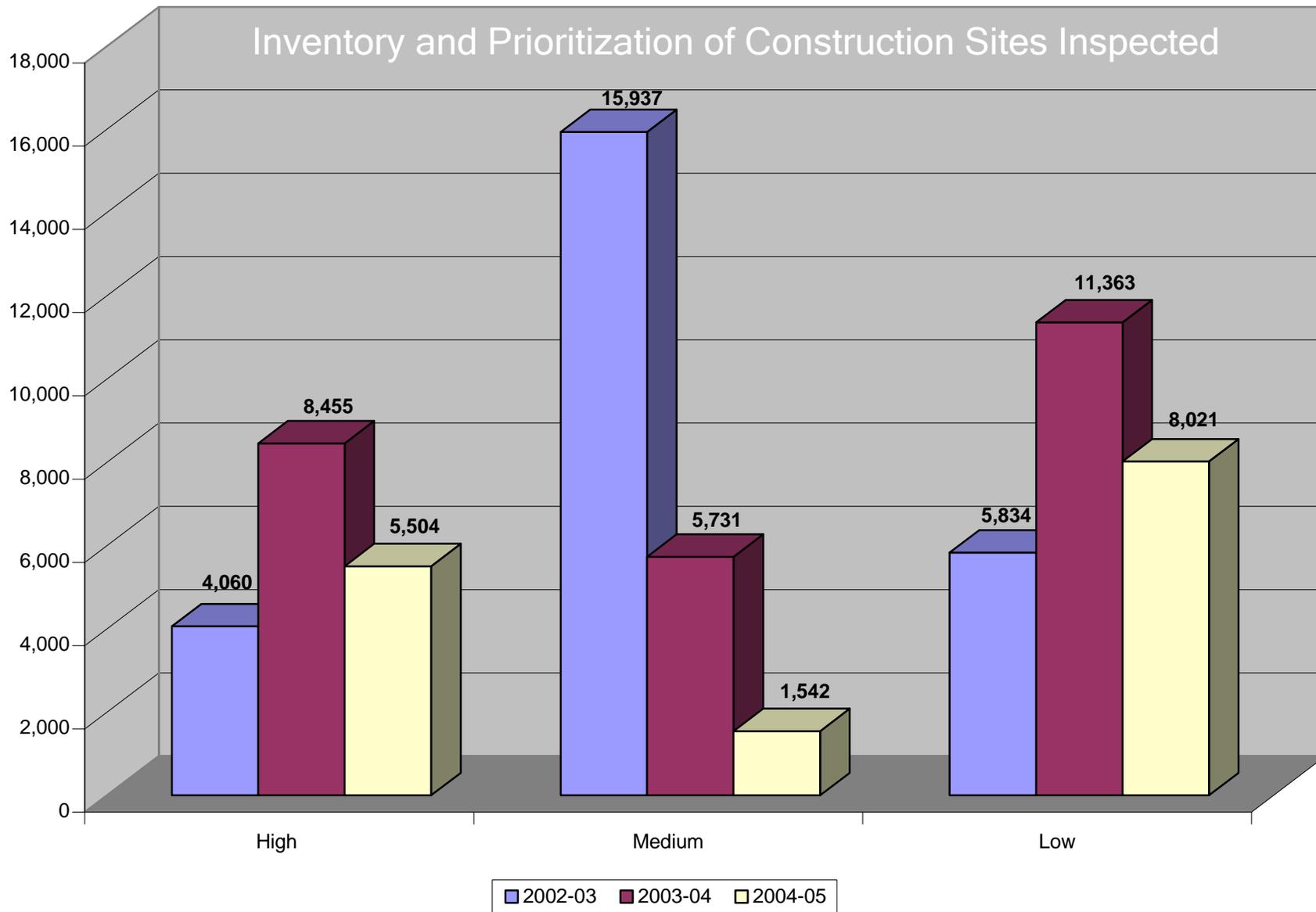


Figure 8.2: Inspection Results, Comparison of 2002-03, 2003-04 and 2004-05

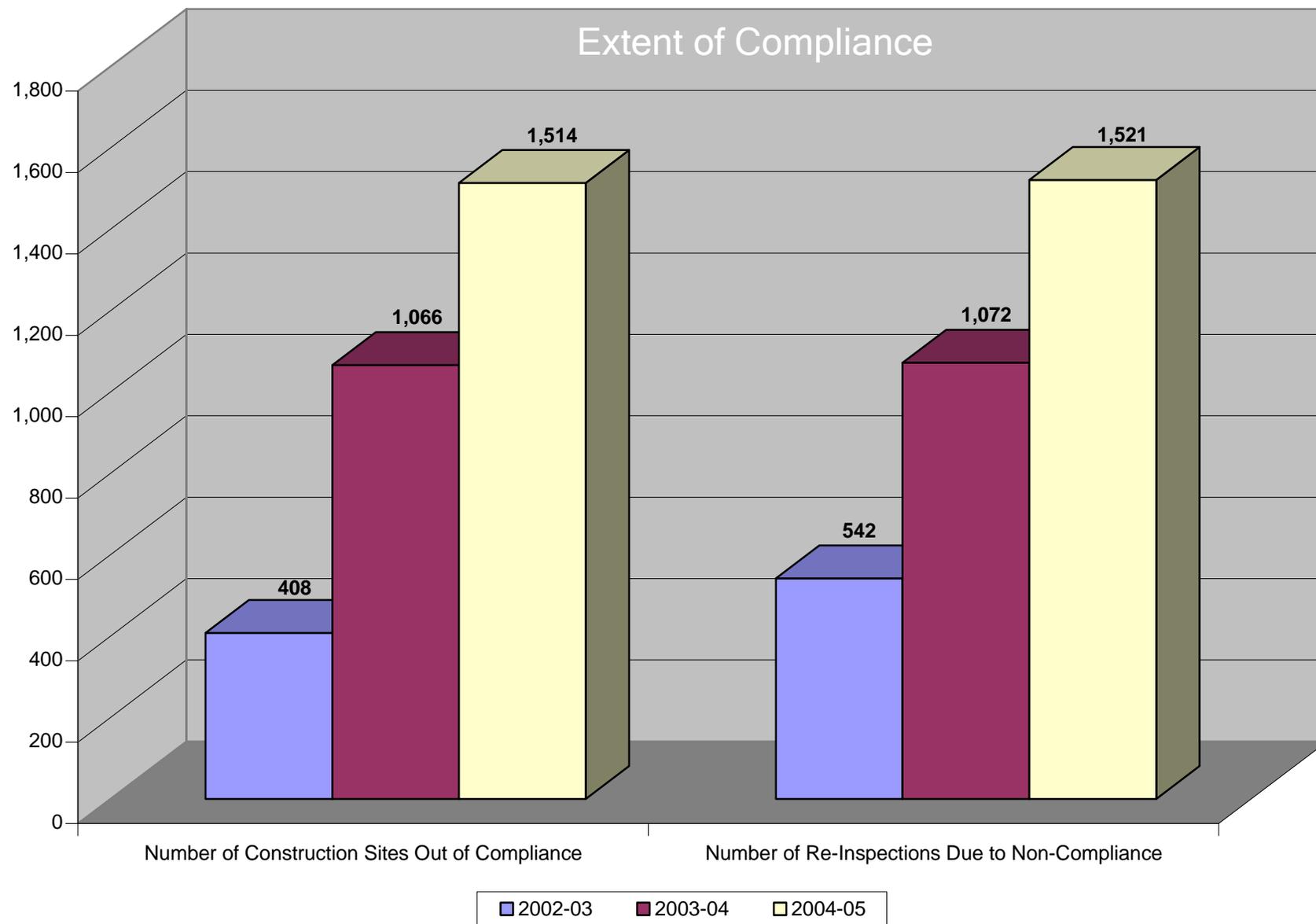
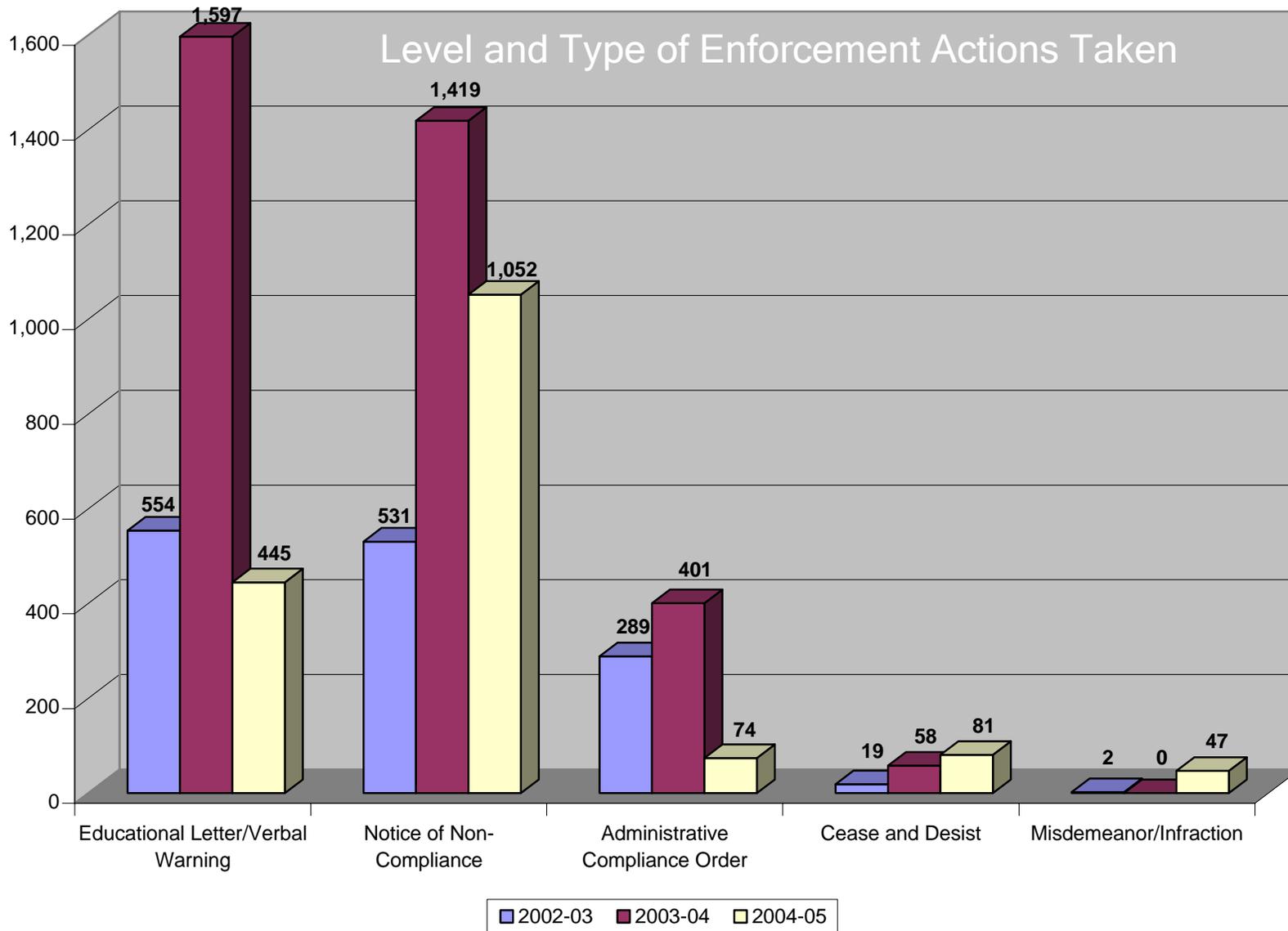


Figure 8.3: Enforcement Action Taken, Comparison of 2002-03, 2003-04 and 2004-05



## 9.0 EXISTING DEVELOPMENT

### 9.1 Introduction

Stormwater discharges from commercial and industrial facilities can become contaminated when material management practices allow exposure to stormwater and/or there is commingling of runoff with wastes. The purpose of **DAMP Section 9.0** is to provide a programmatic framework for the regulatory oversight of activities in commercial and industrial areas. Through inspections, outreach and requiring compliance with water quality ordinances, the Permittees are able to pro-actively address the quality of urban and stormwater runoff from industrial and commercial facilities. In addition, **DAMP Section 9.0** also provides a programmatic framework, based upon education and outreach approaches, for addressing activities in residential areas. Both the industrial/commercial and residential elements were added to the Program by the Third Term Permits.

### 9.2 Accomplishments

#### 9.2.1 Model Industrial/Commercial Program

The Model Industrial/Commercial Program was developed and implemented in 2002-03. It transformed the Permittees oversight of commercial and industrial facilities/activities by establishing a formal inspection program where previously there had been a series of notifications and inspections initiated by complaints. The Model Industrial/Commercial Program requires the Permittees to:

- Identify and inventory facilities/activities with the potential to discharge pollutants:

Initially, 8,546 industrial facilities (**Table 9.1; Figure 9.1**) and 22,789 commercial facilities were identified and inventoried (**Table 9.2; Figure 9.2**).

- Prioritize facilities based upon water quality threat and receiving water sensitivity:

The Permittees prioritized 8,546, 8,604 and 2,821 industrial facilities in 2002-03, 2003-04 and 2004-05 respectively. Concurrently, 22,789, 23,778, and 25,411 commercial facilities were similarly evaluated and prioritized over the same respective periods.

- Establish Model Maintenance Procedures:

Twenty-two (22) model BMP fact sheets have been prepared which include a description of specific minimum source control BMPs for common industrial and commercial activities that may discharge pollutants. Specific BMPs may be adjusted on a jurisdictional basis as necessary. Where applicable, optional controls have been identified that should be considered for implementation at high priority facilities.

Typically each fact sheet contains the following sections:

- Pollution Prevention

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- Suggested Best Management Practices
  - Training
  - References and Resources
- Conduct inspections and monitoring to ensure that commercial and industrial facilities are minimizing their impacts on the environment:

In the 2002-03, 2003-04 and 2004-05 reporting periods the Permittees completed 1,017, 4,029 and 2,706 inspections, respectively.

- Conduct inspections of food facilities:

The Orange County Permittees developed and submitted a food facility inspection program to the Santa Ana Regional Board on July 1, 2002. This program, which also meets the inspection requirements of the San Diego Regional Board, involves inspections and the distribution of educational materials at the approximately 10,000 existing restaurants countywide. The implementation of the Program is an addition to the environmental health inspections conducted by the County of Orange Health Care Agency (HCA). The HCA inspectors identify NPDES issues during these inspections, and they are forwarded to the respective Permittees and addressed by Permittee staff.

For the 2004-05 reporting period, 25,078 food facility inspections were conducted and 1,416 were reported to have NPDES issues (**Table 9.3**).

- Undertake Non-compliance Notification and Enforcement:

Enforcement for the industrial and commercial component of the Existing Development Program is the responsibility of individual Permittees. Each Permittee has several different levels of enforcement to choose from for different types of situations. This includes - from least severe to most severe - issuance of an educational letter, a notice of non-compliance, an administrative compliance order, a cease and desist order, or a misdemeanor/infracton.

The Permittees reported a total of 371 enforcement actions against industrial facilities during the 2004-05 reporting period

- Participate in Training:

To assist municipal staff in implementing the Existing Development Program for industrial and commercial facilities, five training modules were developed:

1. Existing Development Program Management Module (targeting jurisdictional program coordinators and providing guidance regarding management of an inspection program;
2. Field Implementation of Existing Development Program Module (targeting inspectors and providing guidance on conducting inspections);

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3. Existing Development Program Training – Automobile Mechanical Repair, Maintenance, Fueling and Cleaning Businesses Module;
  4. Existing Development Program Training – Landscape Maintenance Businesses Module, and
  5. Existing Development Program Training – Industrial Stormwater Monitoring Module.
- Conduct Education and Outreach:

A number of education and outreach efforts, conducted under the overall public education element of the Program (see **DAMP Section 6.0**), directly supported implementation of the Model Industrial Commercial Program, specifically:

Mailings – During 2003-05 there was one mass mailing of an outreach letter for corporate environmental managers of food service establishments (FSE) and one mass mailing of education materials to all Orange County FSEs.

Outreach Materials –The following materials were developed by the Public Education Committee supportive of **Section 9.0**:

### **Brochures**

- *Mobile Detailing and the Water Quality Act*
- *Water Quality Guidelines for Exterior Restaurant Cleaning Operations*
- *Water Quality Guidelines for Carpet Cleaning Activities*
- *Help Prevent Ocean Pollution: Tips for Hardscape and Landscape Drains*
- *Help Prevent Ocean Pollution: Tips for Home Improvement*

### **Posters**

- Food/Restaurant Industry
- *“Help Prevent Ocean Pollution”* Food Facility BMPs Poster
- Auto Repair Industry
- Good Gas Station Operating Practices

**“The Quad”** - “The Quad” was developed as a tool to communicate with Cities, Businesses, Utilities and Organizations. Each Quad contains a newsletter, press release, fact sheet and billing insert focusing on a seasonal stormwater theme. Four seasonal quads were created during this reporting period, two of which were distributed in this reporting period. The following were the 2004-05 Quad themes:

- *“Spring Into Cleaning – Disposal of Household Hazardous Waste”*
- *“Summer: Yard Care”*
- *“Fall: Prepare for the Rainy Season”*
- *“Winter: New Years Resolution – Green in the New Year”*

**FSE Outreach** – The following materials were developed specifically for FSEs.

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- *“Help Prevent Ocean Pollution”: A Guide for Food Service Establishments*
- *“Help Prevent Ocean Pollution” Food Facility BMPs Poster*
- *“Help Prevent Ocean Pollution” Food Facility BMPs Stickers*
- Bilingual CD-Rom illustrating appropriate Food Facility BMPs
- Food Facility BMP PowerPoint Presentation
- Food Facility BMP Fact Sheet

Other: Developed an urban nutrient outreach program targeting independent gardeners operating in the San Diego Creek/Newport Bay Watershed with Proposition 13 funding awarded to the County to investigate the sources of nutrients from the urban environment and test the effectiveness of structural and non-structural BMPs.

### 9.2.2 Model Residential Program

The Model Residential Program was developed and implemented in 2002-03 to further reduce pollutants potentially released into the environment from residential activities, including efforts to reduce over-watering. The main thrust of the residential program is to advocate pollution prevention practices as the most effective method to protect receiving water quality. The Model Residential Program requires the Permittees under the jurisdiction of the San Diego Regional Board to:

- Develop a source identification procedure and prioritize residential areas based on proximity to Environmentally Sensitive Areas (ESAs) within the Permittee’s jurisdiction.
- Identify Best Management Practices (BMPs) most appropriate for each area, based on residential activities:

See discussion of Outreach Materials (below).

- Conduct public outreach and education:

A number of education and outreach efforts, conducted under the overall public education element of the Program (see **DAMP Section 6.0**), directly supported implementation of the Model Residential Program, specifically:

Outreach Materials -The following materials were developed by the Public Education Committee supportive of **Section 9.0**:

#### **Brochures**

- *Help Prevent Ocean Pollution: Tips for Hardscape and Landscape Drains*
- *Help Prevent Ocean Pollution: Tips for Horse Care*
- *Help Prevent Ocean Pollution: Tips for Using Paint*
- *Help Prevent Ocean Pollution: Tips for Home Improvement*

**“The Quad”** - “The Quad” was developed as a tool to communicate with

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cities, businesses, utilities and organizations such as home owner associations. Each Quad contains a newsletter, press release, fact sheet and billing insert focusing on a seasonal stormwater theme. Four seasonal quads were created during this reporting period, two of which were distributed in this reporting period. The following were the 2004-05 Quad themes:

- “Spring Into Cleaning - Disposal of Household Hazardous Waste”
- “Summer: Yard Care”
- “Fall: Prepare for the Rainy Season”
- “Winter: New Years Resolution - Green in the New Year”

### 9.2.3 Other Programs

During the reporting period, the Principal Permittee developed an urban nutrient outreach program targeting residential gardeners operating in the San Diego Creek/Newport Bay Watershed. The outreach program was one element of a Proposition 13 funded investigation of nutrient sources in an urban environment and structural and non-structural BMP effectiveness.

## 9.3 Assessment

The current and potential Program Effectiveness Assessment Outcome Levels that could be assessed within the current program are summarized in **Table 9-4** (Industrial/Commercial) and **Table 9.5** (Residential).

### 9.3.1 Model Industrial/Commercial Program

**Inventories:** Completing the inventory of industrial and commercial facilities has been problematic for some jurisdictions since the Standard Industrial Classification (SIC) codes on the business licenses (the primary source of this information for those jurisdictions with a business license program) have been incorrectly provided by businesses.<sup>1</sup> In addition, inventorying commercial facilities is extremely difficult because they are numerous, often transitory, and can only be identified through site visits. Mobile businesses are particularly problematic because they typically do not have a permanent facility location.

The Unified Annual Progress Reports include tables reporting the total number of commercial and industrial facilities and their respective prioritizations, organized by

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<sup>1</sup> The Notice of Intent (NOI) form attached to the Draft Industrial General Permit (February 2005) and the SWRCB’s NOI processing system have been modified to accept both Standard Industrial Classification (SIC) codes and North American Industrial Classification System (NAICS) codes. The USEPA has indicated it intends to incorporate the NAICS codes into the storm water regulations but has not yet done so. The Proposed 2006 Multi-Sector General Permits for Stormwater Discharges Associated with Industrial Activity (MSGP) contains a note that “a complete list of SIC Codes (and conversions from the newer North American Industry Classification System [NAICS]) can be obtained from the Internet at [www.census.gov/epcd/www/naics.html](http://www.census.gov/epcd/www/naics.html) or in paper form from various locations in the document titled Handbook of Standard Industrial Classifications, Office of Management and Budget, 1987.”

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Permittee. However, since the structure and content of the jurisdictional databases can differ between the Permittees, analysis of data on a regional or countywide basis is challenging. Indeed, there appears to be a persistent disparity between the number of industrial and commercial facilities inventoried and the number of industrial and commercial facilities that were prioritized over the reporting period (see **Tables 9.1** through **9.3** and **Figures 9.1** through **9.2**). This disparity points to the need to augment facility descriptions beyond SIC codes.

### **DAMP Modification:**

- Provide more detailed industrial and commercial facility descriptions to assist in inventory standardization.

**Prioritization:** Commercial and industrial facilities must be classified as high, medium, or low priority to determine the frequency of inspection. The DAMP details a risk and receiving water sensitivity based point system for classification, the result of which is a total score indicating the facility priority. A change in facility prioritization can be indicative of programmatic success, since a finding that BMPs are being implemented (a behavior change) reduces the risk of pollutants being discharged which can result in a change in prioritization. However, both Permits specify mandatory high-priority commercial and industrial facilities. In addition, the San Diego Region Permittees are required to inventory only high-priority commercial facilities i.e. there are no designation of medium and low priority commercial facilities.

**Headline Indicator - Prioritization of Facilities (Industrial Facilities):** For 2004-05, 2,821 industrial facilities were prioritized, 27% of which were ranked as high priority; for 2003-04, 8,604 industrial facilities were prioritized, 13% of which were ranked as high priority; and for 2002-03, 8,546 industrial facilities were prioritized, 15% of which were ranked as high priority (**Table 9.1; Figure 9.1**).

- Level 1: Implement Program
- Level 3: Behavior Change

**Headline Indicator - Prioritization of Facilities (Commercial Facilities):** For 2004-05, 25,411 commercial facilities were prioritized, 20% of which were ranked as high priority; for 2003-04, 23,778 commercial facilities were prioritized, 24% of which were ranked as high priority; and for 2002-03, 22,789 commercial facilities were prioritized, 22% of which were ranked as high priority (**Table 9.2; Figure 9.2**).

- Level 1: Implement Program
- Level 3: Behavior Change

The year-to-year comparisons suggest some inconsistent reporting of this indicator. Part of this inconsistency arises from the interpretation of the extent to which a facility “tributary to” a sensitive receiving water, which is a key determinant in prioritization. From the Annual Progress Reports (See **DAMP Appendix C**), it is evident that “tributary to” is variously being interpreted as more than “next to” but “less than the whole watershed.” Also, although the point system is used by many of the Permittees, some perceive it as time-consuming and too subjective, and, as a result, may rely primarily on professional judgment. In addition, the ability of the prioritization process to meaningfully provide for a risk-based approach is also dampened by the requirements for mandatory high priority sites. Despite these reservations, it is possible that the decreased numbers of high priority sites in the most recent annual reporting period may also reflect increased findings of no stormwater exposures and diminished site risk.

**ROWD Commitment:**

- Develop a more detailed prioritization process to improve standardized reporting and to support re-direction of inspection resources to significant sources of priority constituents of concern

**Inspection:** The Permittees generally conduct two types of inspections: compliance inspections and follow-up inspections. Should an inspected site demonstrate non-compliance, inspection frequency must be increased as specified in the Permits until compliance is achieved. Although these inspections are generally viewed as beneficial, there is a regulatory agency perception (highlighted in meetings with Regional Board staff) that the inspections may be missing key items of concern and discouraging findings of non-compliance which add to the inspection burden by requiring additional follow-up activity.

**Headline Indicator - Number of BMPs Implemented (Industrial Facilities):** For 2004-05, 2,706 industrial facilities were reported to have BMP implementation, 68% of which have full BMP implementation; for 2003-04, 4,029 industrial facilities were reported to have BMP implementation, 59% of which have full BMP implementation; and for 2002-03, 1,026 industrial facilities were reported to have BMP implementation, 53% of which have full BMP implementation (**Table 9.6; Figure 9.3**).

Level 1: Implement Program

Level 3: Behavior Change

**Headline Indicator - Number of BMPs Implemented (Commercial Facilities):** For 2004-05, 5,566 commercial facilities were reported to have BMP implementation, 59% of which have full BMP implementation; for 2003-04, 8,484 commercial facilities were reported to have BMP implementation, 77% of which have full BMP implementation; and for 2002-03, 1,389 commercial facilities were reported to have BMP implementation, 63% of which have full BMP implementation (**Table 9.7; Figure 9.4**).

Level 1: Implement Program

Level 3: Behavior Change

It is also proving difficult for the inspectors to categorize BMP implementation at commercial and industrial sites along a three-point scale (fully, partially, or not implemented) because such a scale requires overly subjective determinations. Lastly, the requirement for follow-up inspections of all non-compliant sites every month is perceived to be excessive due to the already large number of sites in many cities' inventories.

**ROWD Commitment:**

- Develop effective alternative to re-inspection such as self-certification.

**Headline Indicator – Food Facility Inspections:** For the 2004-05 reporting period, 25,078 food facility inspections were conducted and 1,416 were reported to have NPDES issues (**Table 9.3**). For the 2003-04 reporting period, 12,635 food facility inspections were conducted and 1,298 were reported to have NPDES issues in the six month period of program implementation.

Level 1: Implement Program

Level 3: Behavior Change

The 2003-04 comparison suggests that food facility inspections and the associated education and outreach efforts are having a positive impact since the incidence of NPDES issues decreases from 1 in 10 inspections to 1 in 17 inspections .

**Enforcement:** Permittees are required to use a progressive enforcement approach and initiate enforcement actions where commercial and industrial facilities are found to be out of compliance. In general, specific facilities that are repeat offenders are identified through active database inventories and, in most cases, progressive enforcement is used to bring repeat offenders into compliance.

**Headline Indicator – Number and Level of Enforcement Actions (Industrial Facilities):** The Permittees reported a total of 371 enforcement actions against industrial facilities during the 2004-05 reporting period, 3,146 during the 2003-04 reporting period, and 533 during the 2002-03 reporting period (**Table 9.8**). The 2004-05 figure represents an 89% decrease from the total reported in 2003-04.

Level 1: Implement Program

Level 3: Behavior Change

**Headline Indicator – Number and Level of Enforcement Actions (Commercial Facilities):** The Permittees reported a total of 1,192 enforcement actions against commercial facilities during the 2004-05 reporting period, 1,534 during the 2003-04 reporting period, and 490 during the 2002-03 reporting period (**Table 9.9**). The 2004-05 figure represents a 22% decrease from the total reported in 2003-04.

Level 1: Implement Program

Level 3: Behavior Change

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The 2003-04 comparison suggests some inconsistent reporting (e.g. Newport Beach, which compiled enforcement activity data in 2004-05 Unified Report, Section 2.10.0). However, the consistent pattern of reduced enforcement activity in the most recent reporting period across the Construction, Existing Development, and Illegal Discharges/Illicit Connections areas of the Program also suggests an increased level of compliance, also viewed as behavior change, by the regulated community.

**Training:** The Permits require that staff is adequately trained. In response, the Permittees developed several training modules, which are provided annually throughout the year. The training that has taken place has been deemed helpful. However, the training modules need to be updated frequently enough to keep pace with the developments in the field of stormwater management, maintain staff interest, and to provide inspectors with a technical understanding of a broad array of BMPs that can be shared with facility owner/operators.

### **ROWD Commitment:**

- Prepare defined expertise and competencies for authorized inspector positions and develop a training schedule to meet these requirements

### 9.3.2 Model Residential Program

The Residential Model Program was developed to fulfill the residential activity and related commitments and requirements of Section F.3.d of the SDR Permit. The Common Interest Areas/Homeowners Associations (CIA/HOA) Activities Program was developed to fulfill the existing CIA/HOA activity commitments and requirements of Section F.6 of the SDR Permit.

**Identification and Inventory:** The SDR Permittees are required to identify high priority areas and activities as defined in the Permit. CIAs are considered to include high-priority areas and activities.

**BMP Implementation:** The SDR Permittees are required to identify minimum BMPs for high-priority areas and activities and, as necessary, additional controls. Some Permittees use a baseline BMP implementation approach for Residential areas and CIAs/HOAs unless inspectors notice a specific concern.

**Enforcement and Reporting:** SDR Permittees are required to enforce their stormwater ordinances for all residential areas and activities as necessary to maintain Permit compliance. The primary issue with residential areas and CIAs/HOAs concerns over irrigation. Enforcement actions taken against CIAs/HOAs include letters or notices, which generally leads to resolution of the issues. Some Permittees have reported some limited success using self certifications as a tool for effective implementation of the program within residential and CIA/HOA areas.

**9.4 Summary**

The Third Term Permits have required the Permittees to develop and implement a formal inspection program commencing with an initial inventory of potentially 30,000 facilities being subject to municipal oversight for stormwater and urban runoff issues. Over the first three years of this effort, there has been a clear trend in the level of inspection and enforcement activity that, despite some uncertainties with respect to reporting, suggests increased BMP implementation and compliance with local water quality ordinances by the existing industrial and commercial sector in Orange County. Based upon perceived positive outcomes of the Existing Development elements of the DAMP, the Permittees are proposing minor program modifications based upon the need for the continued training of inspectors and the sensitizing of the prioritization and inspection process toward a more effective risk-based approach.

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Table 9.1: Countywide Permittees' Industrial Inventory and Prioritization, Comparison of 2002-03, 2003-04 and 2004-05

PERMITTEE	HIGH 2002-03	HIGH 2003-04	HIGH 2004-05	MEDIUM 2002-03	MEDIUM 2003-04	MEDIUM 2004-05	LOW 2002-03	LOW 2003-04	LOW 2004-05	TOTAL 2002-03	TOTAL 2003-04	TOTAL 2004-05
Aliso Viejo	2	2	2	65	65	42	0	0	0	67	67	44
Anaheim	129	115	93	419	45	0	868	1,126	299	1,416	1,286	392
Brea	11	14	13	32	28	27	167	137	111	210	179	151
Buena Park	24	184	115	52	18	17	0	17	27	76	219	159
Costa Mesa	489	287	13	329	475	2	0	40	128	818	802	143
Cypress	2	4	0	5	2	0	34	38	0	41	44	0
Dana Point	NA	0	0	NA	0	0	NA	0	0	NA	0	0
Fountain Valley	4	44	4	0	0	48	32	0	0	36	44	52
Fullerton	36	38	37	23	23	0	554	344	0	613	405	37
Garden Grove	25	41	30	35	51	11	310	296	25	370	388	66
Huntington Beach	30	25	30	38	69	13	645	529	23	713	623	66
Irvine	236	3	95	98	21	0	841	520	0	1,175	544	95
La Habra	NA	65	65	NA	249	48	NA	228	59	NA	542	172
La Palma	8	5	5	2	3	5	9	11	0	19	19	10
Laguna Beach	0	0	0	28	23		35	14		63	37	0
Laguna Hills	NA	1	0	NA	0	0	NA	0	0	NA	1	0
Laguna Niguel	2	1	0	0	0	0	0	0	0	2	1	0
Laguna Woods	0	0	0	0	0	0	0	0	0	0	0	0
Lake Forest	11	11	12	0	0		0	0		11	11	12
Los Alamitos	6	7	1	71	19	27	24	96	23	101	122	51
Mission Viejo	5	4	4	30	31		56	56		91	91	4
Newport Beach	2	2	2	0	0	0	11	11	11	13	13	13
Orange	69	52	72	422	416	228	256	249	0	747	717	300
Placentia	21	16	12	18	0		6	109	40	45	125	52
R S Margarita	1	1	3	10	10	10	19	19	19	30	30	32
San Clemente	2	3	2	72	72		0	0		74	75	2
S J Capistrano	1	1	1	11	5	5	15	8	4	27	14	10
Santa Ana	102	100	82	1,266	1,031	615	0	574	5	1,368	1,705	702
Seal Beach	2	2	2	0	0	0	0	0	0	2	2	2
Stanton	NA	18	18	NA	17	15	NA	118	0	NA	153	33
Tustin	9	11	13	59	6	7	0	49	55	68	66	75
Villa Park	NA	0	0	NA	0	0	NA	0	0	NA	0	0
Westminster	10	4	4	37	18	18	34	6	6	81	28	28
Yorba Linda	29	4	7	214	206	88	0	13	2	243	223	97
County of Orange	13	16	12	13	12	9	0	0	0	26	28	21
<b>TOTALS</b>	<b>1,281</b>	<b>1,081</b>	<b>749</b>	<b>3,349</b>	<b>2,915</b>	<b>1,235</b>	<b>3,916</b>	<b>4,608</b>	<b>837</b>	<b>8,546</b>	<b>8,604</b>	<b>2,821</b>

NA = Not Available

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Table 9.2: Countywide Permittees' Commercial Inventory and Prioritization, Comparison of 2002-03, 2003-04 and 2004-05

PERMITTEE	HIGH 2002-03	HIGH 2003-04	HIGH 2004-05	MEDIUM 2002-03	MEDIUM 2003-04	MEDIUM 2004-05	LOW 2002-03	LOW 2003-04	LOW 2004-05	TOTAL 2002-03	TOTAL 2003-04	TOTAL 2004-05
Aliso Viejo	153	153	110	0	0		0	0		153	153	110
Anaheim	114	14	13	278	310	310	194	307	307	586	631	630
Brea	0	0	0	138	117	129	0	180	228	138	297	357
Buena Park	0	119	283	5	40	20	0	50	26	5	209	329
Costa Mesa	1,306	1,107	969	587	555	483	4,559	2,548	2,083	6,452	4,210	3,535
Cypress	0	56	2	38	162	19	39	6	203	77	224	224
Dana Point	238	205	228	0	0		0	0		238	205	228
Fountain Valley	0	112	40	0	0	77	314	139	139	314	251	256
Fullerton	7	7	126	23	23	164	639	631	116	669	661	406
Garden Grove	0	7	47	102	90	204	5,797	5,807	5,587	5,899	5,904	5,838
Huntington Beach	403	261	276	7	170	206	233	920	831	643	1,351	1,313
Irvine	0	0		105	103	148	1,040	1,038	1,132	1,145	1,141	1,280
La Habra	NA	378	414	NA	340	306	NA	177	254	NA	895	974
La Palma	0	0		17	18	12	25	30	31	42	48	43
Laguna Beach	336	356		0	2		0	7		336	365	0
Laguna Hills	NA	237	325	NA	0		NA	0		NA	237	325
Laguna Niguel	182	183	177	0	0		0	0		182	183	177
Laguna Woods	28	24	24	3	3	3	65	83	89	96	110	116
Lake Forest	10	124	150	17	68		50	182		77	374	150
Los Alamitos	NA	98		173	32		800	0		973	130	0
Mission Viejo	426	423	484	0	0		0	0		426	423	484
Newport Beach	41	41	41	40	40	40	40	40	42	121	121	123
Orange	269	0		241	311	311	54	700	725	564	1,011	1,036
Placentia	127	375		44	0		310	0	373	481	375	373
R S Margarita	126	146	141	13	0	0	377	0	438	516	146	579
San Clemente	463	688	626	0	0		0	0		463	688	626
S J Capistrano	248	316	216	0	0	277	0	0	1,401	248	316	1,894
Santa Ana	0	0		779	26	26	1	917	923	780	943	949
Seal Beach	NA	0	23	NA	183	2	NA	0	859	NA	183	884
Stanton	NA	31	31	NA	168	168	NA	476	476	NA	675	675
Tustin	1	0	1	103	104	39	0	0	40	104	104	80
Villa Park	0	0	0	0	1	1	0	6	6	0	7	7
Westminster	354	140	213	95	365	443	278	354	428	727	859	1,084
Yorba Linda	20	25	42	171	162	126	0	6	5	191	193	173
County of Orange	97	107	106	46	48	47	0	0	0	143	155	153
<b>TOTALS</b>	<b>4,949</b>	<b>5,733</b>	<b>5,108</b>	<b>3,025</b>	<b>3,441</b>	<b>3,561</b>	<b>14,815</b>	<b>14,604</b>	<b>16,742</b>	<b>22,789</b>	<b>23,778</b>	<b>25,411</b>

NA = Not Available

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Table 9.3: Food Facility Inspections 2003-04 and 2004-05

PERMITTEE	2003-04		2004-05	
	No. of Routine Inspections	No. of NPDES Issues	No. of Routine Inspections	No. of NPDES Issues
Aliso Viejo	116	50	218	37
Anaheim	1721	40	3,285	22
Brea	256	19	506	23
Buena Park	301	91	686	12
Costa Mesa	724	98	1,412	74
Cypress	175	12	421	0
Dana Point	186	9	374	12
Fountain Valley	313	72	545	22
Fullerton	539	46	1,054	123
Garden Grove	738	2	1,412	280
Huntington Beach	691	64	1,420	17
Irvine	718	169	1,388	52
La Habra	273	11	548	40
La Palma	42	18	118	1
Laguna Beach	203	7	382	31
Laguna Hills	149	91	332	72
Laguna Niguel	193	21	406	16
Laguna Woods	24	18	59	13
Lake Forest	307	8	547	27
Los Alamitos	98	12	193	8
Mission Viejo	325	51	591	40
Newport Beach	501	33	1,037	20
Orange	725	25	1,451	61
Placentia	185	8	386	18
Rancho Santa Margarita	95	0	179	23
San Clemente	284	5	529	7
San Juan Capistrano	1261	111	302	17
Santa Ana	141	28	2,436	145
Seal Beach	122	13	217	3
Stanton	168	20	504	1
Tustin	377	12	648	60
Villa Park	18	1	26	1
Westminster	418	123	931	96
Yorba Linda	139	4	328	23
County of Orange	109	6	207	19
<b>Totals</b>	<b>12635</b>	<b>1298</b>	<b>25,078</b>	<b>1,416</b>

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Table 9.4: Current and Potential Outcome Levels (Industrial/Commercial)

Industrial/Commercial Program Component	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
<b>Inventory</b>	✓ Maintain inventory					
<b>Prioritization</b>	✓ Assign priorities		✓ Change in prioritization level			
<b>Inspection</b>	✓ Conduct and Track number of inspections		✓ # BMPs implement	<sup>P</sup> Load reduction associated with BMPs		
<b>Enforcement/ Reporting</b>	✓ Conduct enforcement		✓ Extent and correction of problem level of enforcement			
<b>Training</b>	✓ Track number/type of training sessions	<sup>P</sup> Surveys show improved knowledge				
<p><u>Key:</u>                      ✓ = Currently Achieved Outcome Level  <sup>P</sup> = Potentially Achievable Outcome Level</p>						

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Table 9.5: Current and Potential Outcome Levels (Residential)

Residential & CIA/HOA Program Component	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
<b>Identification/Inventory</b>	✓ Maintain inventory					
<b>BMP Implementation</b>	✓ Conduct Inspections	✓ BMP Implementation	✓ Track number of BMPs implemented	<sup>P</sup> Load reduction associated with BMPs		
<b>Enforcement/ Reporting</b>	✓ Issue EAs	✓ Track number of EAs issued & response	<sup>P</sup> Correction of problem			
<p><u>Key:</u>                      ✓ = Currently Achieved Outcome Level  <sup>P</sup> = Potentially Achievable Outcome Level</p>						

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Table 9.6: Industrial Inventory and BMP Implementation, Comparison of 2002-03, 2003-04 and 2004-05

PERMITTEE	NUMBER OF FACILITIES WITH BMPs:												TOTAL 2002-03	TOTAL 2003-04	TOTAL 2004-05	
	FULLY Implemented	FULLY Implemented	FULLY Implemented	PARTIALLY Implemented	PARTIALLY Implemented	PARTIALLY Implemented	NO BMPs Implemented	NO BMPs Implemented	NO BMPs Implemented	Modify/Upgrade or Implement BMP's 2002-03 <sup>a</sup>	TOTAL 2002-03	TOTAL 2003-04				TOTAL 2004-05
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05							
Aliso Viejo	2	49	31	1	15	11	0	0		1	4	64	42			
Anaheim	0	160	312	0	82	80	0	0		0	0	242	392			
Brea	NA	NA	15	NA	NA		NA	NA	10	NA	NA	NA	25			
Buena Park	NA	188	151	NA	33	102	NA	0	29	NA	NA	221	282			
Costa Mesa	142	530	115	0	168	28	0	0		193	335	698	143			
Cypress	NA	0	NA	NA	4	NA	NA	0	NA	NA	0	4	NA			
Dana Point	NA	0	NA	NA	0	NA	NA	0	NA	NA	NA	0	NA			
Fountain Valley	10	36	52	5	8		5	0		5	25	44	52			
Fullerton	36	38	34	NA	23	2	NA	344		NA	36	405	36			
Garden Grove	NA	55	28	NA	43	38	NA	3	1	NA	NA	101	67			
Huntington Bch	3	52	14	4	19	20	17	28	33	4	28	99	67			
Irvine	136	132	37	31	467	58	12	68		26	205	667	95			
La Habra	NA	8	49	NA	57	108	NA	28	15	NA	NA	93	172			
La Palma	0	NA	1	0	NA	6	0	NA	1	0	0	NA	8			
Laguna Beach	NA	21		NA	16		NA	0		NA	NA	37	0			
Laguna Hills	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	NA	0			
Laguna Niguel	3	0		0	0		0	0		0	3	0	0			
Laguna Woods	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	0	NA			
Lake Forest	0	0	12	11	11		0	0		0	11	11	12			
Los Alamitos	NA	8		NA	0		NA	0		NA	0	8	0			
Mission Viejo	24	0	2	43	4	2	13	0		56	136	4	4			
Newport Beach	4	1	1	0	1	2	0	0		0	4	2	3			
Orange	NA	64	142	NA	2	149	NA	0	9	NA	NA	66	300			
Placentia	16	0	3	14	19	7	12	2	1	14	56	21	11			
R S Margarita	0	0	2	0	0	2	0	0	28	0	0	0	32			
San Clemente	NA	NA	2	NA	NA	0	NA	NA	0	NA	NA	NA	2			
S J Capistrano	1	10	8	2	4	2	0	0	0	1	4	14	10			
Santa Ana	NA	818	639	NA	132	63	NA	0		NA	NA	950	702			
Seal Beach	NA	0	1	NA	2	1	NA	0	0	NA	NA	2	2			
Stanton	NA	28	28	NA	4	58	NA	1	1	NA	NA	33	87			
Tustin	NA	17	17	NA	49		NA	0		NA	NA	66	17			
Villa Park	0	0	0	1	0	0	0	0	0	0	1	0	0			
Westminster	1	24	25	0	3	3	0	1		0	1	28	28			
Yorba Linda	166	130	94	0	0	3	1	0		1	168	130	97			
County of Orange	NA	19	16	NA	0	2	NA	0	0	NA	0	19	18			
<b>TOTALS</b>	<b>544</b>	<b>2,388</b>	<b>1,831</b>	<b>112</b>	<b>1,166</b>	<b>747</b>	<b>60</b>	<b>475</b>	<b>128</b>	<b>301</b>	<b>1,017</b>	<b>4,029</b>	<b>2,706</b>			

NA = Not Available

<sup>a</sup> Modifications/Upgrades only applicable to 2002-03 reporting year.

SECTION 9.0, EXISTING DEVELOPMENT

Table 9.7: Commercial Inventory and BMP Implementation, Comparison of 2002-03, 2003-04 and 2004-05

PERMITTEE	Number of Facilities with BMPs:											
	FULLY Implemented 2002-03	FULLY Implemented 2003-04	FULLY Implemented 2004-05	PARTIALLY Implemented 2002-03	PARTIALLY Implemented 2003-04	PARTIALLY Implemented 2004-05	NO BMPs Implemented 2002-03	NO BMPs Implemented 2003-04	NO BMPs Implemented 2004-05	TOTAL 2002-03	TOTAL 2003-04	TOTAL 2004-05
Aliso Viejo	69	35	35	4	64	75	8	4		81	103	110
Anaheim	0	35	46	0	2	27	0	0		0	37	73
Brea	NA	0	0	NA	0	0	NA	0	0	NA	0	0
Buena Park	0	183	98	5	29	60	0	0	43	5	212	201
Costa Mesa	623	3,298	64	0	665	2	0	0		623	3,963	66
Cypress	NA	0		NA	2	2	NA	0		0	2	2
Dana Point	NA	NA	25	NA	NA	145	NA	NA	11	NA	NA	181
Fountain Valley	0	251	225	0	0		0	0		0	251	225
Fullerton	NA	0		NA	0		NA	0		NA	0	0
Garden Grove	NA	66	824	NA	29	455	NA	3	4	NA	98	1,283
Huntington Bch	9	59	26	2	108	21	11	120	34	22	287	81
Irvine	NA	DNR		NA	DNR		NA	DNR		NA	DNR	0
La Habra	NA	28	85	NA	107	111	NA	36	77	NA	171	273
La Palma	0	24	22	0	18	13	0	0		0	42	35
Laguna Beach	NA	NA		NA	NA		NA	NA		NA	NA	0
Laguna Hills	31	150	222	0	0		3	10	5	34	160	227
Laguna Niguel	0	123	27	0	15	18	0	0		0	138	45
Laguna Woods	NA	0		NA	27	28	NA	0		0	27	28
Lake Forest	0	0		77	48	19	0	0		77	48	19
Los Alamitos	NA	86		NA	12		NA	0		0	98	0
Mission Viejo	68	164	268	314	51	29	57	0		439	215	297
Newport Beach	NA	NA	6	NA	NA	6	NA	NA		NA	NA	12
Orange	NA	207	0	NA	0	0	NA	0	0	NA	207	0
Placentia	NA	0	32	9	63	32	NA	0		9	63	64
R S Margarita	0	0	64	0	0	21	0	0	482	0	0	567
San Clemente	NA	139	NA	NA	12	NA	NA	0	NA	NA	151	NA
Santa Ana	NA	818	304	NA	132	109	NA	0		NA	950	413
S J Capistrano	75	139	132	7	12	0	15	0	0	97	151	132
Seal Beach	NA	0	0	NA	122	0	NA	0	0	NA	122	0
Stanton	NA	35	35	NA	10	10	NA	3	10	NA	48	55
Tustin	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA
Villa Park	0	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	633	675	0	219	409	0	7		0	859	1,084
Yorba Linda	NA	10	27	NA	27	7	NA	0		NA	37	34
County of Orange	2	41	49	NA	3	10	NA	NA	0	2	44	59
<b>TOTALS</b>	<b>877</b>	<b>6,524</b>	<b>3,291</b>	<b>418</b>	<b>1,777</b>	<b>1,609</b>	<b>94</b>	<b>183</b>	<b>666</b>	<b>1,389</b>	<b>8,484</b>	<b>5,566</b>

NA = Not Available

DNR = Did Not Report

SECTION 9.0, EXISTING DEVELOPMENT

Table 9.8: Permittee Enforcement Actions for Industrial Facilities, Comparison of 2002-03, 2003-04 and 2004-05

PERMITTEE	EL 2002-03	EL 2003-04	EL 2004-05	NON 2002-03	NON 2003-04	NON 2004-05	ACO 2002-03	ACO 2003-04	ACO 2004-05	CDO 2002-03	CDO 2003-04	CDO 2004-05	M/I 2002-03	M/I 2003-04	M/I 2004-05	TOTAL 2002-03	TOTAL 2003-04	TOTAL 2004-05
Aliso Viejo	0	2	3	0	1	17	0	0	8	0	0		0	0		0	3	28
Anaheim	NA	0	0	NA	2	0	NA	1	0	NA	0	0	NA	0	0	NA	3	0
Brea	2	0	13	0	0	1	0	0		0	0		0	0		2	0	14
Buena Park	NA	0	2	NA	39	6	NA	5	13	NA	1	4	NA	0	1	NA	45	26
Costa Mesa	NA	0		NA	0		NA	0		NA	0		NA	0		NA	0	0
Cypress	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0
Dana Point	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
Fountain Valley	5	393	52	0	8		0	12	1	0	6	1	0	0		5	419	54
Fullerton	36	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	36	0	NA
Garden Grove	2	5	2	0	0		0	0		0	0		0	0		2	5	2
Huntington Beach	6	0		0	0	5	0	15		0	0		0	0	1	6	15	6
Irvine	NA	939	95	NA	0		NA	939	95									
La Habra	NA	0		NA	0	28	NA	0		NA	0		NA	0		NA	0	28
La Palma	0	19	10	0	0		0	0		0	0	1	0	0		0	19	11
Laguna Beach	NA	0		NA	0		NA	0		NA	0		NA	0		NA	0	0
Laguna Hills	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0
Laguna Niguel	0	0		0	0		0	0	0	0	0		0	0		0	0	0
Laguna Woods	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA
Lake Forest	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0
Los Alamitos	NA	0		NA	0		NA	0		NA	0		NA	0		NA	0	0
Mission Viejo^	NA	0		NA	103		NA	0		NA	0		NA	0		NA	103	0
Newport Beach	6	8	2	250	618	0	200	315	0	0	0	0	0	550	0	456	1491	2
Orange	NA	66	0	NA	4	1	NA	0	0	NA	0	0	NA	0	0	NA	70	1
Placentia	7	7	10	0	0		0	0		0	0		0	0		7	7	10
R S Margarita	0	0	2	0	0		0	0		0	0		0	0		0	0	2
San Clemente	NA	7	0	NA	2	0	NA	2	0	NA	0	0	NA	0	0	NA	11	0
S J Capistrano	1	14	10	1	0	2	0	0	0	0	0	0	0	0	0	2	14	12
Santa Ana	NA	0	1	NA	0	2	NA	0		NA	0		NA	0		NA	0	3
Seal Beach	NA	NA	5	NA	NA	0	NA	NA	5									
Stanton	DNR	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	0
Tustin	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
Villa Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	0	9	5	0	4	0	0		0	0		0	0		5	5	13
Yorba Linda	0	0	59	1	0	0	0	0	0	0	0	0	0	0	0	1	0	59
County of Orange	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
<b>TOTALS</b>	<b>76</b>	<b>1,460</b>	<b>275</b>	<b>257</b>	<b>779</b>	<b>66</b>	<b>200</b>	<b>350</b>	<b>22</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>0</b>	<b>550</b>	<b>2</b>	<b>533</b>	<b>3,151</b>	<b>371</b>

NA = Not Available      EL = Educational Letter      ACO = Administrative Compliance Order      M/I = Misdemeanor/Infraction  
DNR = Did Not Report      NON = Notice of Non-Compliance      CDO = Cease and Desist Order

^ Enforcement actions against industrial facilities are included with commercial facilities.

SECTION 9.0, EXISTING DEVELOPMENT

Table 9.9: Permittee Enforcement Actions for Commercial Facilities, Comparison of 2002-03, 2003-04, and 2004-05

PERMITTEE	EL 2002-03	EL 2003-04	EL 2004-05	NON 2002-03	NON 2003-04	NON 2004-05	ACO 2002-03	ACO 2003-04	ACO 2004-05	CDO 2002-03	CDO 2003-04	CDO 2004-05	M/I 2002-03	M/I 2003-04	M/I 2004-05	TOTAL 2002-03	TOTAL 2003-04	TOTAL 2004-05
Aliso Viejo	70	3	4	0	0	4	2	13	2	0	0	2	0	0	1	72	16	13
Anaheim	NA	0		NA	0	0	NA	0	0									
Brea	NA	4	3	NA	1		NA	0		NA	0		NA	0		NA	5	3
Buena Park	5	0		0	87	16	0	19	33	0	4	16	0	0	4	5	110	69
Costa Mesa	2	10	6	3	3	67	0	10		0	0		0	0		5	23	73
Cypress	2	0		4	2		0	0		0	0		0	0		6	2	0
Dana Point	13	14	57	41	19	3	1	0	1	0	0		1	0	1	56	33	62
Fountain Valley	6	251	256	6	2	4	21	3	7	5	1	2	0	0		38	257	269
Fullerton	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA
Garden Grove	5	37	5	2	8	1	0	0		0	0		0	0		7	45	6
Huntington Beach	16	0		3	10	13	0	80		1	0		0	0	5	20	90	18
Irvine	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	0
La Habra	NA	0		NA	0	25	NA	0	1	NA	0		NA	0		NA	0	26
La Palma	0	0	15	0	0		0	0		0	0		0	0		0	0	15
Laguna Beach	NA	0		NA	0		NA	0	2	NA	0		NA	0		NA	0	2
Laguna Hills	NA	11	6	NA	9	4	NA	1		NA	0		NA	0		NA	20	10
Laguna Niguel	0	127		1	15	32	0	0		0	0		0	0		1	142	32
Laguna Woods	3	0	15	4	0	18	1	0	10	0	0		0	0		8	0	43
Lake Forest	77	1		1	14	12	0	0		0	0	1	0	0		78	15	13
Los Alamitos	NA	0		NA	0		NA	0		NA	0		NA	0		NA	0	0
Mission Viejo	118	0	2	20	103	16	0	0	17	1	0	0	0	0	2	139	103	37
Newport Beach	NA	NA	2	NA	NA		NA	NA	2									
Orange	NA	269	0	NA	13	0	NA	0	0	NA	0	0	NA	0	0	NA	283	0
Placentia	10	30	64	0	0	13	1	0	1	2	0	1	0	0	1	13	30	80
R S Margarita	10	0	32	0	0	7	0	0		0	0		0	0		10	0	39
San Clemente	NA	187	91	NA	82	63	NA	15		NA	2		NA	7	24	NA	293	178
S J Capistrano	25	10	150	7	2	5	0	0	0	0	0	0	0	0	0	32	12	155
Santa Ana	NA	0	1	NA	3	18	NA	0	1	NA	0		NA	0		NA	3	20
Seal Beach	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
Stanton	DNR	DNR		DNR	DNR		DNR	DNR		DNR	DNR		DNR	DNR		NA	DNR	0
Tustin	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
Villa Park	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	0	2	0	2	3	0	0		0	0		0	0		0	2	5
Yorba Linda	0	45	19	0	1	0	0	0	0	0	0	0	0	0	0	0	46	19
County of Orange	NA	0	0	NA	4	3	NA	0	0	NA	0	0	NA	0	0	NA	4	3
<b>TOTALS</b>	<b>362</b>	<b>999</b>	<b>730</b>	<b>92</b>	<b>380</b>	<b>327</b>	<b>26</b>	<b>141</b>	<b>75</b>	<b>9</b>	<b>7</b>	<b>22</b>	<b>1</b>	<b>7</b>	<b>38</b>	<b>490</b>	<b>1,534</b>	<b>1,192</b>

NA = Not Available      EL = Educational Letter      ACO = Administrative Compliance Order      M/I = Misdemeanor/Infraction  
DNR = Did Not Report      NON = Notice of Non-Compliance      CDO = Cease and Desist Order

Figure 9.1: Countywide Permittees' Industrial Inventory and Prioritization, Comparison of 2002-03, 2003-04 and 2004-05

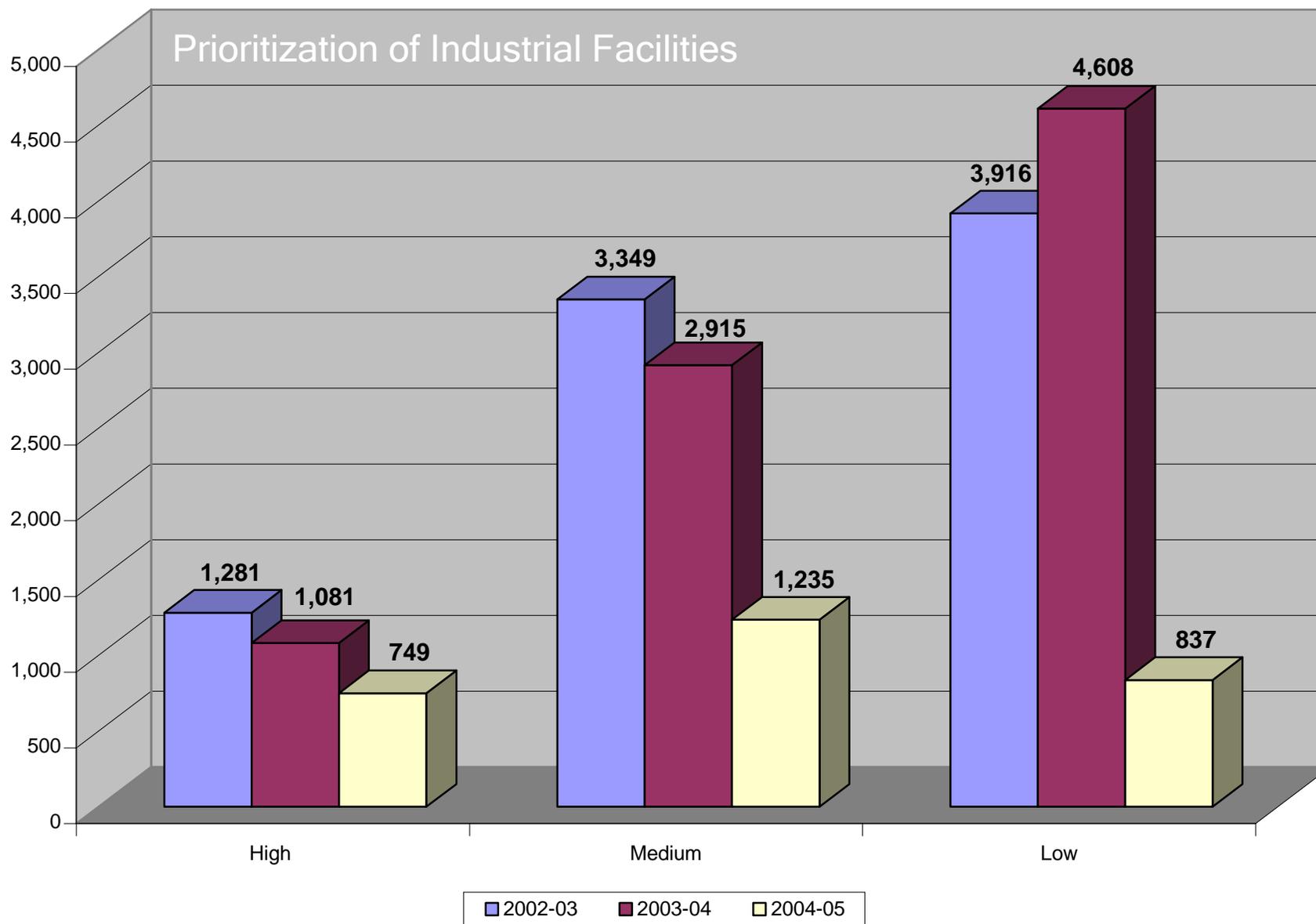


Figure 9.2: Countywide Permittees' Commercial Inventory and Prioritization, Comparison of 2002-03, 2003-04 and 2004-05

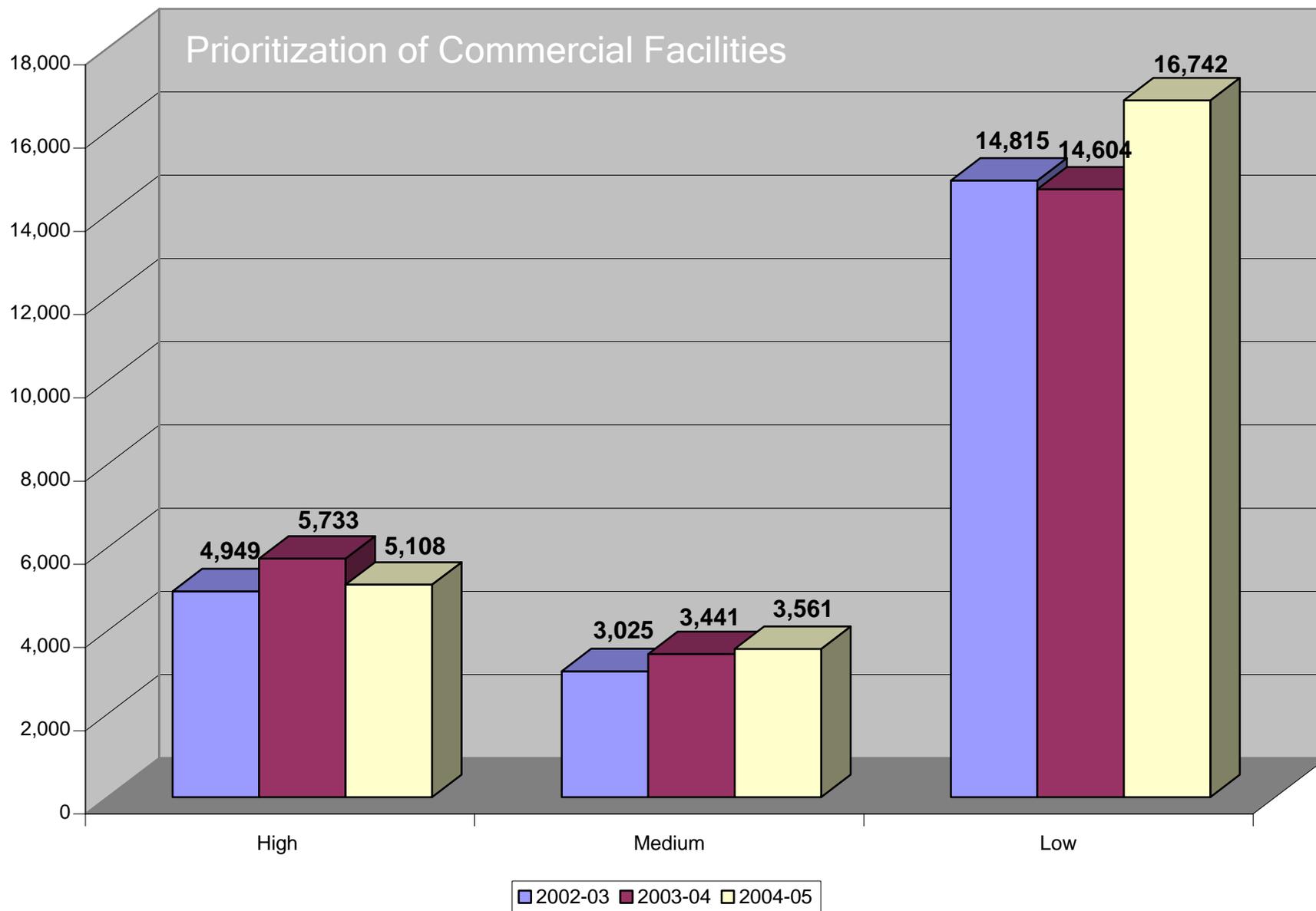


Figure 9.3: Industrial Inventory and BMP Implementation, Comparison of 2002-03, 2003-04 and 2004-05

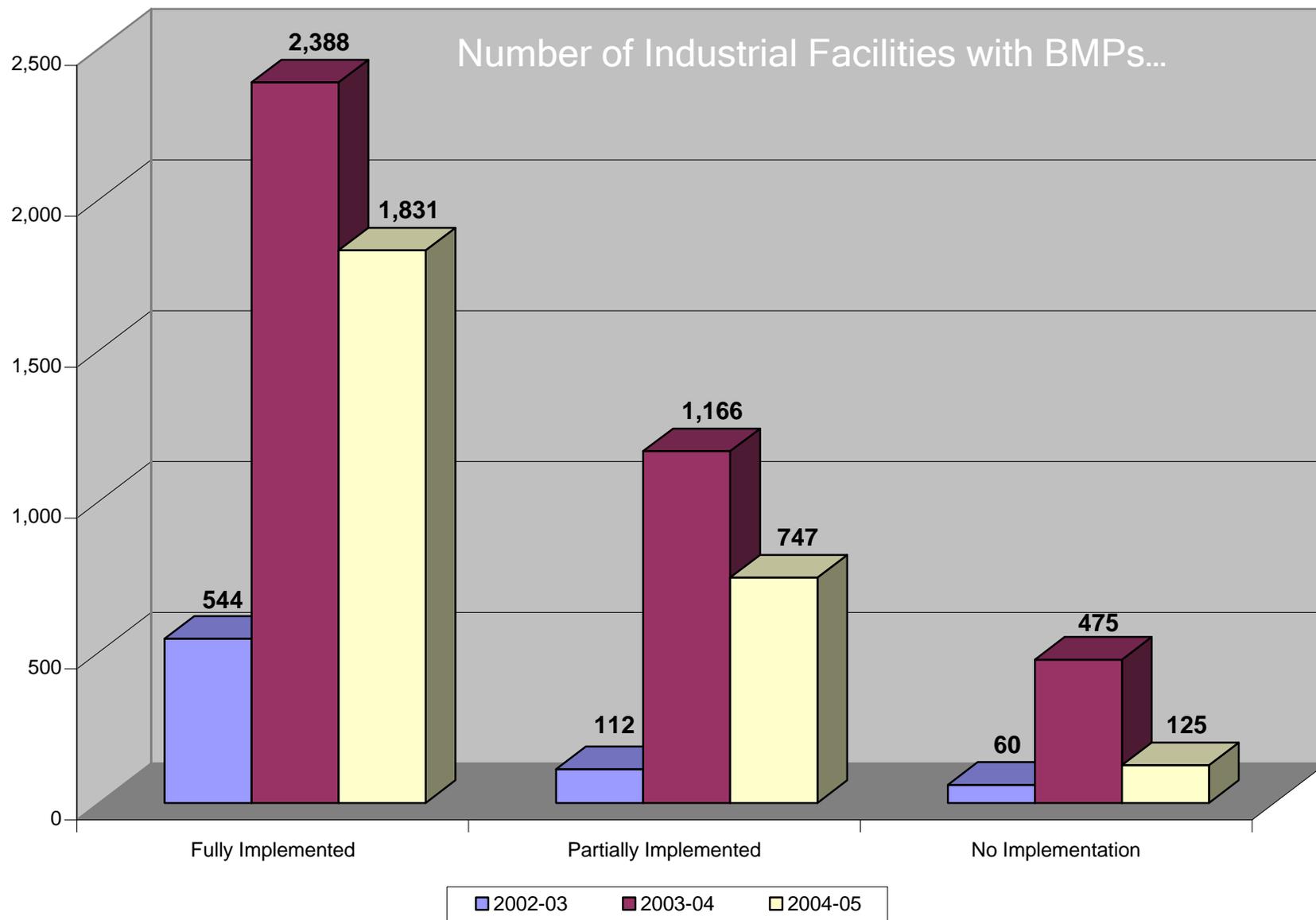
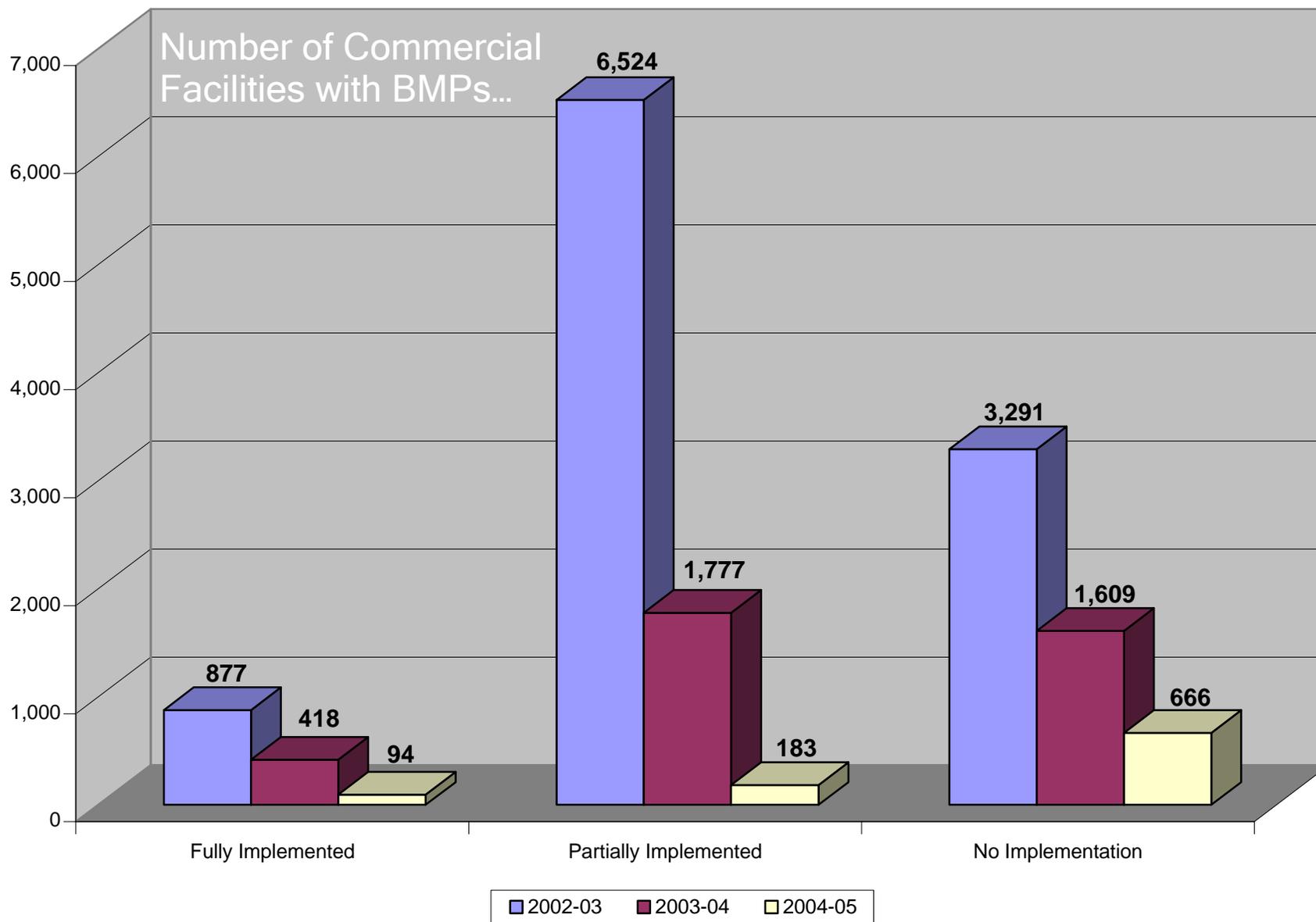


Figure 9.4: Commercial Inventory and BMP Implementation, Comparison of 2002-03, 2003-04 and 2004-05



## 10.0 ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

### 10.1 Introduction

Illegal discharges/illicit connections (ID/IC) are potential sources of pollutants within municipal storm drain systems. The purpose of **DAMP Section 10.0** is to ensure that the Permittees have a programmatic framework for detecting and quickly responding to non-stormwater discharges to their storm drain systems. Since **DAMP Section 10.0** directly addresses one of the basic objectives of the NPDES Permits, it is a long-established part of the Program. With the Third Term Permits, the key elements of ID/IC have been significantly enhanced. In addition, a model sewage spill response program has been developed and has begun to be implemented in conjunction with OCSD.

### 10.2 Accomplishments

#### 10.2.1 Illegal Discharges/Illicit Connections Program

The ID/IC Program provides guidance for Permittees when identifying, responding to and mitigating the effects of non-stormwater discharges and enforcing the ID/IC component of the Program for the protection of the environment. **DAMP Section 10.0** requires the Permittees to:

- Detect illegal discharges and illicit connections

A innovative Dry Weather Reconnaissance Program, based upon statistically derived benchmarks, was developed and implemented in both permit regions specifically to identify illegal discharges and illicit connections during the typically dry summer months of May through September using a suite of water quality analyses conducted in the field at designated random and targeted drains. The 2004-05 reporting period marked the third season of dry weather monitoring in the San Diego Region. With the approval of the Santa Ana Monitoring Program in July of 2005 by the Executive Officer of the Santa Ana Regional Board, dry weather monitoring in the Santa Ana Region commenced in May of 2006.

- Facilitate Public Reporting

Telephone and web-based reporting systems for the general public have been established and are advertised in the Stormwater Program's public education materials, Orange County "White Pages" telephone directories, and Permittee websites. A total of 3,408 complaints were received during the 2004-05 reporting period.

- Investigate

Each Permittee has designated Authorized Inspectors to investigate compliance with, detect violations of, and take actions pursuant to their Water Quality

## SECTION 10.0, ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

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Ordinance. During the 2004-05 reporting period, the Permittees encountered and sought to mitigate discharges involving hydrocarbons (296 incidents), inorganic materials (264 incidents), metals (6 incidents), nutrients (43 incidents), 73 organic materials (73 incidents), discharge exceptions (133 incidents), pathogens (156 incidents), wastewater (624 incidents), pesticides (2 incidents), sediment (680 incidents), trash and debris (376 incidents), and 716 incidents involving miscellaneous types of materials for a total 3,369 incidents.

- Enforce

Enforcement actions are undertaken according to the adopted Water Quality Ordinances and accompanying Enforcement Consistency Guide. The Permittees reported a total of 3,528 enforcement actions, associated with ID/IC investigations during the 2004-05 reporting period.

- Undertake Training

To assist responsible municipal staff in understanding the Illegal Discharges/Illicit Connections Program, 10 training modules have been developed:

- 1) Program Management Training - Introductory
- 2) Program Management Training - Experienced
- 3) Authorized Inspector Training<sup>1</sup>
- 4) Authorized Inspector Training - Introductory
- 5) Authorized Inspector - Field Implementation
- 6) Sewage Spill Response Training
- 7) Sewage Spill Response Training - Introductory
- 8) "Hands-On" Sewage Spill Response Training - Experienced
- 9) Fire Department Activities Training
- 10) Investigative Guidance Manual Training

In addition to the training modules, the Inspection Sub-Committee also provided training on various subjects relevant to the ID/IC program. This sub-committee meets bi-monthly to provide training to municipal inspectors and Authorized Inspectors in issues related to spill response, inspection and enforcement. In addition, this meeting serves as a forum for the coordination and discussion of ongoing difficult or new enforcement, investigation, or enforcement issues and to profile cases or incidents.

### 10.2.2 Model Sewage Spill Response Procedures

During the Third Permit term, the County and OCS D developed and implemented a coordinated sewage spill prevention and response demonstration project (The "Tustin

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<sup>1</sup> This module was modified in the 2004-05 reporting period and divided into two modules, 1) Introductory and 2) Field Implementation.

## SECTION 10.0, ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

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Area Spill Control (TASC) Demonstration Project”). The TASC includes: 1) Development of sanitary sewer overflow (SSO) response procedures; 2) Selection of primary and backup sewage spill response contractors for containment and recovery of SSOs; and 3) SSO hands-on field response training for Permittee staff and municipal sewerage agency staff.

The TASC model program is currently in use in a limited portion of the County, however; one of the goals for TASC is to gradually phase the implementation of the project throughout the County so that the proactive interagency planning and coordination for sewage spill response can be implemented and/or improved in other watersheds

### 10.3 Assessment

The current and potential Program Effectiveness Assessment Outcome Levels that could be assessed within the current program are summarized in **Table 10-1**.

#### 10.3.1 Illegal Discharges/Illicit Connections Program

**Detection:** The San Diego Dry Weather Monitoring Program has been conducted over 3 summers. Over this period there have been 585 site visits to 67 locations comprising 3 visits to the random sites and five visits to the targeted sites each season. Investigations, prompted by findings of elevated contaminant concentrations, were triggered on 18 occasions. These results show that approximately 25% of the 67 monitoring sites have exhibited evidence of contamination in dry weather flow at levels significantly above background levels.

The approval of the Santa Ana Monitoring Program (including the Dry Weather Reconnaissance Program) in July of 2005 by the Executive Officer of the Santa Ana Regional Board meant that the dry weather monitoring in the Santa Ana Region commenced in May of 2006. The 2006-07 Unified Report will present the first opportunity to review the effectiveness of this monitoring effort through comparison of the North and South County efforts.

**Reporting:** RWQCB staff have acknowledged that the Permittees’ field inspectors are trained to detect illegal discharges as part of their daily activities and, indeed, the majority of illegal discharges are detected by Permittee staff. The RWQCB staff also has noted that most Permittees have hotline numbers to receive water pollution complaints and incident information from the public and use database software to document the reported incidents which assists with the tracking of water pollution complaints by source. These RWQCB staff findings point to the overall robustness of the Permittees’ efforts to facilitate reporting.

**Headline Indicator - Number of Complaints:** The Permittees reported a total of 3,408 complaints/incidents during the 2004-05 reporting period. This total represents an 11% decrease from 2003-04 (3,837 complaints), and a 110% increase from 2002-03 (1,621 complaints) (**Table 10.2; Figure 10.1**).

Level 1: Implement Program

Level 3: Behavior Change

While the year-to-year comparison suggests some inconsistent reporting of this indicator, the overall pattern of a peak in the 2003-4 period (which is reproduced across other metrics) tends to suggest the positive impact of the Program (i.e. that there has been an overall reduction in the number of incidents and thereby a commensurate decline in the number of complaints). The increasing use of the “hotline” appears to indicate increasing awareness regarding this reporting mechanism.

**Enforcement:** Enforcement actions are undertaken according to the adopted Water Quality Ordinance and accompanying Enforcement Consistency Guide. In instances of noncompliance, the Permittee may adopt one of four types of remedies, including educational letters, administrative remedies, criminal remedies, or other civil or criminal remedies, as appropriate.

**Headline Indicator - Number and Level of Enforcement Actions:** The Permittees reported a total of 3,528 enforcement actions during the 2004-05 reporting period (**Table 10.3; Figure 10.2**). This represents an 18.9% decrease from the total reported in 2003-04 (4,351 enforcement actions), and an increase of 63% from the total reported 2002-03 (2,167 enforcement actions).

Level 1: Implement Program

Level 3: Behavior Change

The pattern in the number of enforcement arising from ID/IC investigations follows the pattern observed in other metrics of a peak of activity in the 2003-04 reporting period. An increase in the use of citations over the Third Term permit term is one feature of the changing approach to enforcement representing a shift from the prior educational emphasis.

**Training:** The Permits require that staff be adequately trained. In response, the Permittees developed a number of training modules (as outlined in 10.2.1) that are offered by the County throughout the year. Although the Permittees stated that the training has been helpful, they noted that the modules need to be updated and that new training topics and more advanced training are desired.

**ROWD Commitment:**

- Prepare a defined expertise and competencies for Authorized Inspector positions and develop a training program to meet these requirements.

10.3.2 Model Sewage Spill Response Procedures

The 2006-07 Unified Report will present the first opportunity to review the effectiveness of initial implementation of the TASC model program. Based on field experience on actual spills, the intent is to expand the geographical implementation of the program, initially with the area coincident with the boundaries of OCSD.

**10.4 Summary**

The Permittees' program for responding to complaints regarding ID/IC is a long established element of the Program. The major efforts regarding this element over the period of the Third Term Permits relate to the Dry Weather Reconnaissance Program, the continued facilitation of public reporting of complaints, the designation and training of designated Authorized Inspectors, and the development of TASC.

The incidence of complaints appears to have peaked in the 2003-04 reporting period and subsequently declined, which suggest a positive overall Program impact. Based primarily upon the interest of the Permittees and of RWQCB staff, the sole commitment arising out of the effectiveness assessment is for the development of defined experience and competencies for Authorized Inspector positions and development of a training program to meet these requirements.

SECTION 10.0, ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

**Table 10.1: Current Outcome Levels and Suggested Actions or Outcomes to Achieve Potential Outcome Levels**

ID/IC Program Component	Effectiveness Assessment Outcome Levels					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	Implement Program	Increase Awareness	Behavior Change	Load Reduction	Runoff Quality	Receiving Water Quality
<b>Detection of ID/IC</b>	✓ Identify ID/IC	✓ Track number of complaints by source, facility type, or pollutant	✓ Reduced occurrences of ID/IC			
<b>Enforcement</b>	✓ Issue EAs	✓ Track number of Enforcement Actions	✓ Track number and type of Enforcement Actions	<sup>P</sup> Discharge is eliminated	<sup>P</sup> Change in runoff quality	
<b>Training</b>	✓ Track # and type of training	<sup>P</sup> Surveys				
<p><u>Key:</u>                      ✓ = Currently Achieved Outcome Level  <sup>P</sup> = Potentially Achievable Outcome Level</p>						

SECTION 10.0, ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

Table 10.2: Source of Complaints/Incidents, Comparison of 2002-03, 2003-04, and 2004-05

PERMITTEE	City Staff	City Staff	City Staff	Other	Other	Other	Hotline	Hotline	Hotline	Public	Public	Public	Busin-	Busin-	Busin-	Other	Other	Other	TOTAL	TOTAL	TOTAL
	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05	2002-03	2003-04	2004-05
Aliso Viejo	21	38	11	2	3	2	6	4	7	2	12	15	4	3	2	0	0	0	35	60	37
Anaheim	34	117	156	3	45	2	0	95	56	19	0		0	26	13	0	0	0	56	283	227
Brea	NA	3	8	NA	1	20	NA	0	10	NA	0	16	NA	0		NA	0		NA	4	54
Buena Park	5	8	24	1	5	3	0	0	0	4	28	35	0	0	1	0	0	0	10	41	63
Costa Mesa	2	21		0	0	14	10	0		286	27	18	70	14		10	90		378	152	32
Cypress	5	18	14	0	2	3	11	0	7	1	10	7	0	3	4	0	0	0	17	33	35
Dana Point	NA	2	24	NA	13	7	NA	2	6	NA	12	33	NA	0	3	NA	6		NA	35	73
Fountain Valley	29	50	47	5	2	2	16	6	11	8	1	2	0	0		0	0		58	59	62
Fullerton	51	43	1	0	0		0	0		26	30	2	0	0		0	0		77	73	3
Garden Grove	26	15	208	2	5	41	4	10	2	19	84	89	3	6	12	0	0		54	120	352
Huntington Bch	108	387	140	9	11	10	9	0	0	323	51	59	9	1	1	0	0	0	458	450	210
Irvine	32	61	49	4	96	79	0	0	0	33	31	64	0	0	0	0	0		69	188	192
La Habra	0	6	32	0	0	1	0	0		21	19		0	0		0	0		21	25	33
La Palma	27	69	53	1	0	0	1	2	0	4	25	13	0	0	1	0	0	0	33	96	67
Laguna Beach	25	25	23	4	13	13	56	66	55	0	0	0	0	0	0	0	0	0	85	104	91
Laguna Hills	7	11	20	0	1	2	0	1	0	7	0	0	1	0	0	0	0	0	15	13	22
Laguna Niguel	NA	18	14	NA	1	6	NA	2	3	NA	10	2	NA	0	1	NA	0	0	NA	31	26
Laguna Woods	12	13	84	6	1	8	0	0	0	22	65	18	0	3	10	0	0	0	40	82	120
Lake Forest	2	27	35	4	6	16	0	3	3	11	16	44	0	2	7	0	0	0	17	54	105
Los Alamitos	0	0	0	1	12		0	3	0	2	0	0	0	0	0	0	0		3	15	0
Mission Viejo	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	111	NA	NA	0	NA	NA	0	NA	NA	111
Newport Beach	NA	NA	100	NA	NA	5	NA	NA	30	NA	NA	60	NA	NA	10	NA	NA	95	NA	NA	300
Orange	17	76	35	0	6	3	0	0	257	0	59	0	1	9	0	0	0	0	18	150	295
Placentia	9	58	50	0	1	1	0	1	1	5	13	24	0	0	2	0	0	69	14	73	147
R S Margarita	0	4	11	0	1	18	0	5	4	7	3	12	3	0	1	0	0	0	10	13	46
San Clemente	NA	581	NA	NA	6	NA	NA	0	NA	NA	92	NA	NA	0	NA	NA	0	NA	NA	679	NA
S J Capistrano	12	7	8	1	2	1	4	9	10	17	13	26	0	1	1	0	0		34	32	46
Santa Ana	7	6	37	6	7	7	0	0		7	3	6	0	0	2	0	0		20	16	52
Seal Beach	NA	NA	17	NA	NA		NA	NA		NA	NA	14	NA	NA		NA	NA		NA	NA	31
Stanton	NA	0	0	NA	8	0	NA	0		NA	40		NA	2		NA	0		NA	50	0
Tustin	9	19	37	0	0	0	0	0	0	4	8	9	1	0	0	13	0	0	27	27	46
Villa Park	NA	4	5	NA	0	0	NA	0	0	NA	6	10	NA	0	0	NA	0	0	NA	10	15
Westminster	0	26	18	8	8	3	0	19	7	0	65	21	0	33	3	0	0	0	8	151	52
Yorba Linda	6	23	5	1	1	0	0	0	0	23	26	13	0	1	0	0	0	1	30	51	19
County of Orange	12	494	273	1	40	24	4	15	94	17	85	53	0	25	0	0	8	0	34	667	444
<b>TOTALS</b>	<b>458</b>	<b>2,230</b>	<b>1,539</b>	<b>59</b>	<b>297</b>	<b>291</b>	<b>121</b>	<b>243</b>	<b>563</b>	<b>868</b>	<b>834</b>	<b>776</b>	<b>92</b>	<b>129</b>	<b>74</b>	<b>23</b>	<b>104</b>	<b>165</b>	<b>1,621</b>	<b>3,837</b>	<b>3,408</b>

NA = Not Available

SECTION 10.0, ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

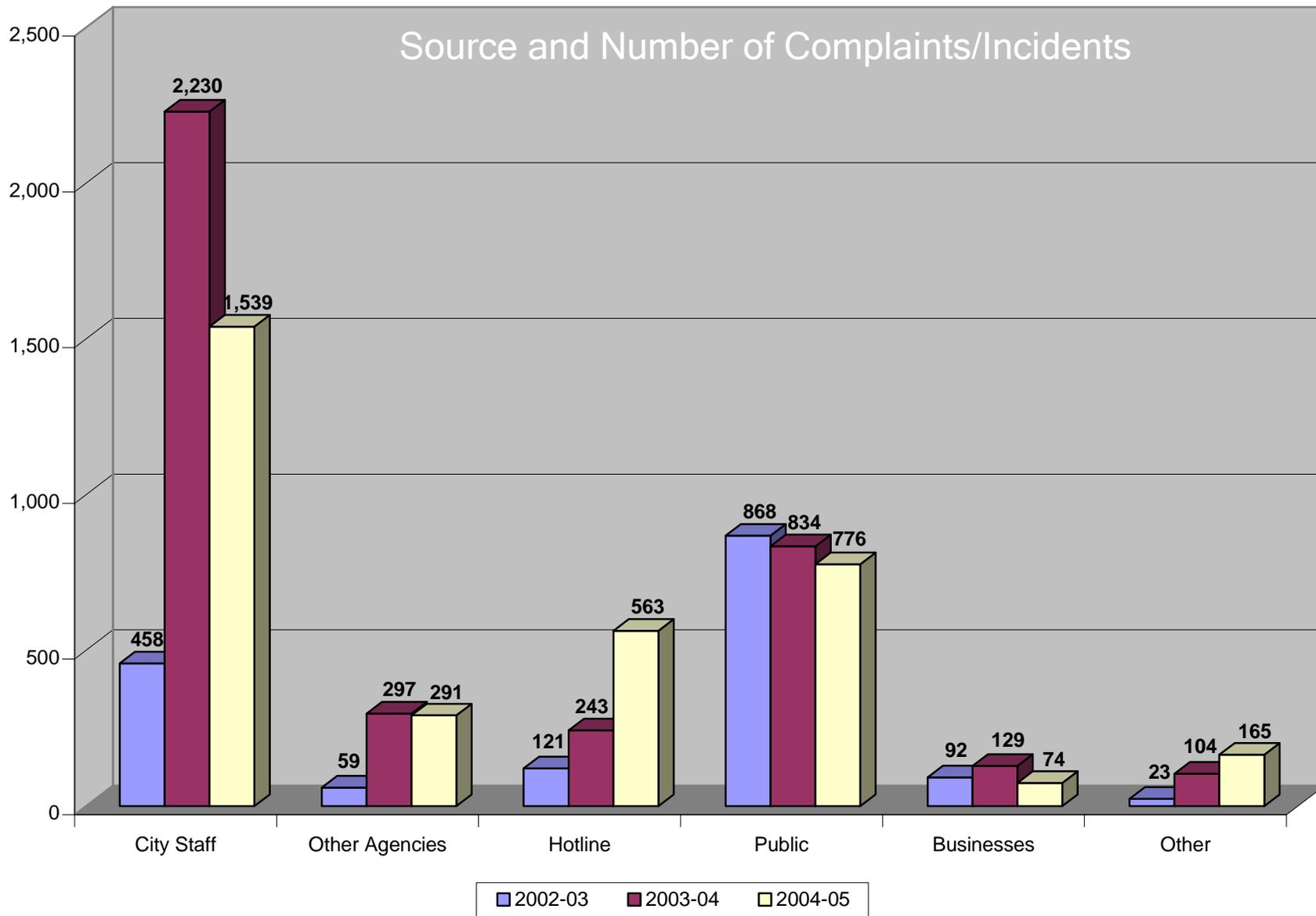
Table 10.3: Permittee Enforcement Actions, Comparison of 2002-03, 2003-04 and 2004-05

Permittee	EL	EL	EL	NON	NON	NON	ACO	ACO	ACO	CDO	CDO	CDO	Mis	Mis	Mis	Inf	Inf	Inf	IOC	IOC	IOC	Other	Other	Other	TOTAL	TOTAL	TOTAL
	02-03	03-04	04-05	02-03	03-04	04-05	02-03	03-04	04-05	02-03	03-04	04-05	02-03	03-04	04-05	02-03	03-04	04-05	02-03	03-04	04-05	02-03	03-04	04-05	02-03	03-04	04-05
Aliso Viejo	0	3	7	27	4	19	0	0	1	0	17	2	0	0	0	0	0	0	4	38	79	3	0	0	34	62	108
Anaheim	0	1	13	20	39	34	11	39	28	1	0	0	2	0	0	0	0	0	0	0	0	1	0	0	35	79	75
Brea	0	11	6	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	13	8
Buena Park	8	5	2	0	10	21	0	16	47	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	8	31	96
Costa Mesa	22	9	7	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	14	2	0	0	0	24	26	9
Cypress	5	10	3	10	21	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	7	17	31	35
Dana Point	NA	14	24	NA	19	12	NA	0	9	NA	0	1	NA	0	0	NA	0	0	NA	0	1	NA	0	18	NA	33	65
Fountain Valley	12	391	71	4	8	6	21	12	15	6	6	9	0	0	0	0	0	0	0	0	0	40	0	50	83	417	151
Fullerton	0	0	NA	23	59	NA	5	0	NA	0	0	NA	0	0	NA	0	14	NA	26	0	NA	0	0	NA	54	73	NA
Garden Grove	21	19	75	2	11	39	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	23	32	115
Huntington Bch	60	61	96	54	47	127	5	5	0	1	0	0	0	0	0	0	0	0	0	0	30	0	2	2	120	113	255
Irvine	32	14	0	0	88	0	24	33	0	0	0	0	0	0	0	0	0	0	0	0	0	14	5	0	70	140	0
La Habra	0	0	0	0	1	15	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	50	19	32	50	20	51
La Palma	18	41	31	8	24	15	0	2	4	0	0	1	0	2	0	0	0	0	0	0	2	0	0	14	26	69	67
Laguna Beach	0	5	2	71	62		52	83	0	0	0	0	1	0	0	0	57	0	0	37	0	60	0	114	184	244	116
Laguna Hills	8	6	16	5	11	20	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	16	18	36
Laguna Niguel	NA	8	10	NA	1	4	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	9	14
Laguna Woods	27	30	15	11	13	18	1	1	0	0	1	0	0	0	0	0	0	0	0	6	2	1	0	0	40	51	35
Lake Forest	90	2	2	3	23	42	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	93	25	45
Los Alamitos	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
Mission Viejo	134	15	5	58	139	31	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	0	0	0	193	154	39
Newport Beach	6	8	20	250	618	209	200	315	0	0	0	0	0	0	0	0	0	0	0	0	166	300	550	1100	756	1491	1495
Orange	0	75	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	2
Placentia	8	20	7	0	11	19	3	3	0	3	1	0	0	0	1	0	0	0	0	0	0	0	31	41	14	66	68
R S Margarita	10	7	48	0	0	13	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	10	8	66
San Clemente	72	430	175	37	160	98	0	10	0	1	9	11	0	0	0	0	0	0	2	0	45	8	10	2	120	619	331
S J Capistrano	24	6	0	9	2	0	0	7	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	34	16	0
Santa Ana	1	4	1	2	9	18	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	14	2	0	19	16	20
Seal Beach	4	35	0	21	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	3	6	0	28	82	31
Stanton	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0	NA	0	0
Tustin	0	169	38	16	27	21	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1	11	0	0	27	201	60
Villa Park	15	0	3	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	15	10	15
Westminster	13	55	35	1	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	52	15	55	92
Yorba Linda	1	2	0	21	34	9	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	22	41	9
County of Orange	5	4	3	20	12	12	2	9	4	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	30	27	19
<b>TOTALS</b>	<b>600</b>	<b>1,460</b>	<b>715</b>	<b>675</b>	<b>1,502</b>	<b>845</b>	<b>327</b>	<b>544</b>	<b>110</b>	<b>16</b>	<b>36</b>	<b>49</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>71</b>	<b>1</b>	<b>34</b>	<b>96</b>	<b>368</b>	<b>511</b>	<b>639</b>	<b>1,439</b>	<b>2,167</b>	<b>4,351</b>	<b>3,528</b>

NA = Not Available      EL = Educational Letter      ACO = Administrative Compliance Order      Mis = Misdemeanor      IOC = Issuance of Citation  
 NON = Notice of Non-Compliance      CDO = Cease and Desist Order      Inf = Infraction

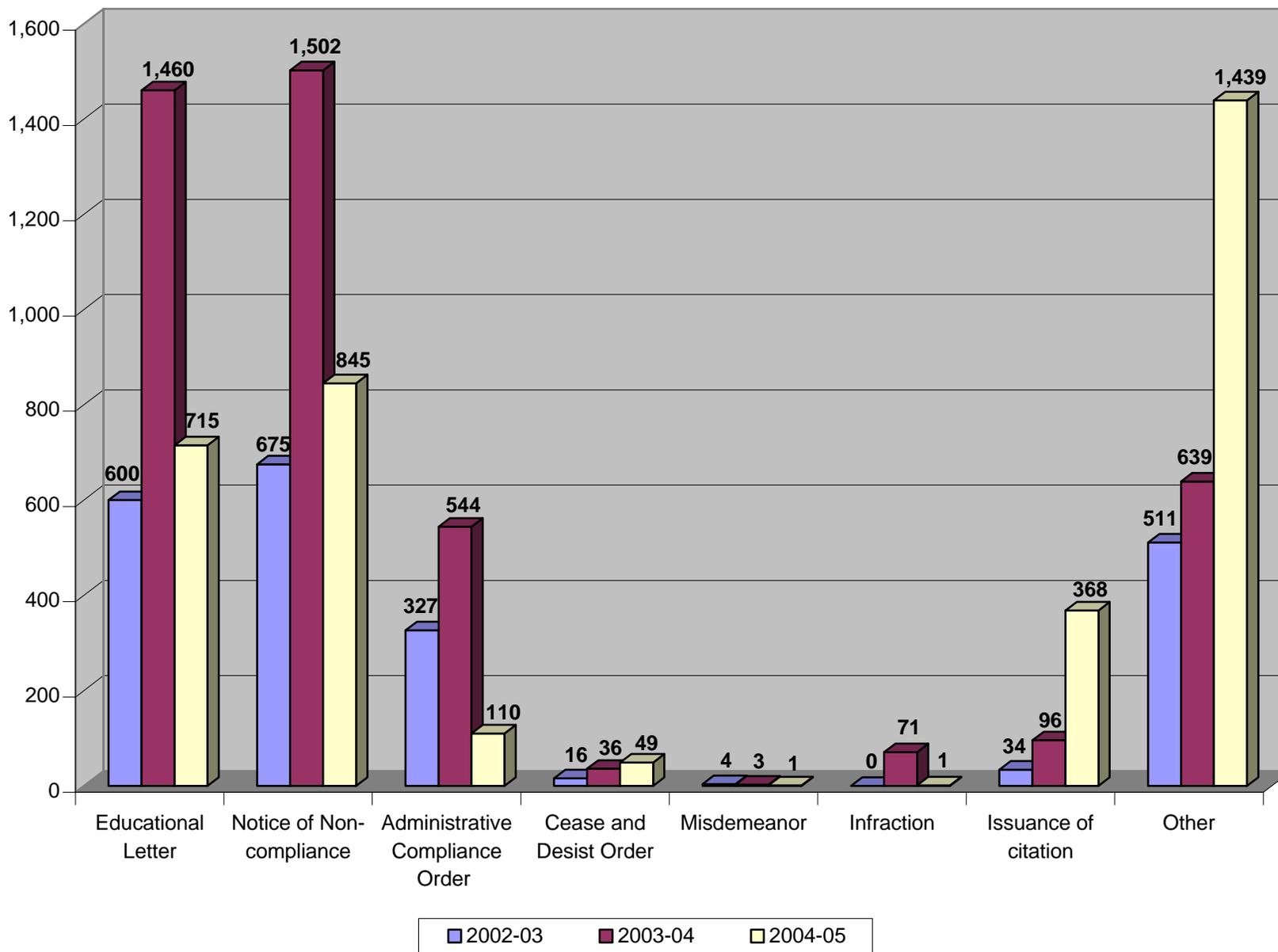
SECTION 10.0, ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

Figure 10.1: Source of Complaints/Incidents, Comparison of 2002-03, 2003-04, and 2004-05



SECTION 10.0, ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

Figure 10.2: Permittee Enforcement Actions, Comparison of 2002-03, 2003-04 and 2004-05



## 11.0 WATER QUALITY MONITORING SUMMARY AND ANALYSES

### 11.1 Introduction

The goal of environmental monitoring is to support the management process.

“monitoring is most useful when it results in more effective management decisions, specifically management decisions that protect or rehabilitate the environment.”  
(NAS, 1991<sup>1</sup>)

On July 1, 2003 the Permittees submitted a proposed monitoring plan to the Santa Ana Regional Board for the Third Term Permit. This monitoring plan design was based on the model stormwater monitoring plan developed by a subcommittee of the southern California Stormwater Monitoring Coalition (SMC). This subcommittee was comprised of representatives from southern California stormwater agencies, Regional and State Water Resources Control Board staff, EPA Region 9, and the Southern California Coastal Water Research Project (SCCWRP).

With input from Regional Board staff, many additions to the proposed plan for the Third Term permit were made to accommodate development of the Toxics TMDLs for San Diego Creek and Newport Bay. The plan was finally approved during the summer of 2005 and subsequently implemented.

In the interim period between issuance of the Third Term Permit and approval of the new monitoring plan, the program continued monitoring under the Second Term Permit plan (99-04 Plan). Under the 99-04 plan the Permittees identified a group of critical aquatic resources and conducted monitoring to evaluate environmental conditions relative to applicable water quality criteria. The 99-04 Plan also included mass emissions monitoring of stormwater runoff at several locations in the Newport Bay and Anaheim Bay/Huntington Harbour watersheds.

No evaluation is currently possible of data collection that was started under the Third Term Permit. This section will therefore focus on the results of monitoring critical aquatic resources and mass emissions monitoring under the 99-04 Plan.

### 11.2 Accomplishments

#### 11.2.1 Completion of the 99-04 Monitoring Plan

##### *Critical Aquatic Resources*

The 99-04 Monitoring Plan identified critical aquatic resources in Orange County. In the Santa Ana Regional Board area these included the Newport Bay, Huntington Harbour, and Bolsa Bay. Monitoring during the First Term Permit included evaluations of water chemistry and physical characteristics during periods stormwater runoff, and semi-

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<sup>1</sup> Managing Troubled Waters, National Academy of Sciences, 1991

annual (pre and post storm season) dry-weather assessments of water quality, physical characteristics, and benthic sediment chemistry. The water chemistry assessments included nutrients and trace metals. During the latter part of the First Term Permit dissolved metals were added to the suite of analyses in anticipation of the adoption of the California Toxics Rule (CTR).

Although the monitoring locations in these receiving waters have essentially remained the same from the start of the NPDES program, the most significant change has been the dramatic improvement in the reporting limits for trace metals. For some metals the reporting limits have dropped nearly two orders of magnitude from the early 1990's to 2005. This improvement has allowed more confidence in the assessment of potential aquatic toxicity with respect to the criteria from the CTR.

As in the prior monitoring program the goal at each harbor complex was to monitor two stormwater runoff events per year. Each monitored stormwater event included three separate visits: day 1 of stormwater runoff to receiving water, 2 days after initial sampling, and 4 days after initial sampling. The water chemistry from each sampling was compared to applicable acute saltwater criteria from the CTR. The mean concentrations of the 3 days of stormwater sampling were compared to the chronic saltwater criteria from the CTR.

The following is a summary of the number of stormwater runoff events monitored in the harbors during the last five reporting years. The 2001-02 and 2003-04 storm seasons did not present many monitoring opportunities because of the lower than average rainfall totals.

Reporting Year	Rainfall Total at Santa Ana	Huntington Harbour	Newport Bay
2000-01	14.87"	0	3
2001-02	3.82"	0	0
2002-03	14.57"	2	2
2003-04	8.41"	1	1
2004-05	28.44"	2	2

In order to put the critical aquatic resources sites in a broader regional perspective, aquatic chemistry samples from these locations (e.g., Newport Bay, Huntington Harbour, Bolsa Bay) were combined with aquatic chemistry samples from the mass emissions monitoring program and then evaluated in comparison to acute and chronic toxicity criteria established in the CTR. The data from the bays and harbors were compared to the saltwater criteria from the CTR. The data from the mass emissions sites were compared to the freshwater criteria and to the saltwater criteria if the channel directly discharges to a marine or estuarine receiving water. While such CTR criteria are available for only a portion of the constituents measured in the program's samples, the combination of all available CTR exceedance data provides an overview of patterns across the region. In addition to tabulating the number of exceedances at each station, the overall percentage of exceedances at each station (out of all samples collected at each station) was used to place stations into one of four categories representing relative

frequency of exceedances. These categories were then represented with colored symbols on maps (**Figure 11.1** and **Figure 11.2**) of the region.

**Table 11.2** summarizes the patterns of exceedances of relevant acute toxicity CTR criteria at mass loading and bays/harbors monitoring stations in the Santa Ana region with more than one sampling event. These stations provide the most spatially distributed and consistently sampled set of data for assessing overall levels of specific pollutants in both dry and wet weather. **Table 11.3** summarizes the comparisons of stormwater data from the bays/harbors to relevant chronic toxicity criteria from the CTR.

It should be noted that the comparisons of the concentrations of dissolved metals at mass emission sites near estuarine receiving waters to saltwater criteria from the CTR assume no mixing zone dilution in the receiving waters. During dry weather conditions the impacts would be localized at the channel-receiving water interface. During stormwater runoff the spatial impacts would be greater.

The main findings from the data were that:

1. Exceedances of the acute toxicity criteria in channels and bay/harbors were predominantly due to dissolved copper, with much smaller percentages due to dissolved zinc in some channels.
2. Exceedances of the chronic toxicity criteria in the harbors were due to both dissolved copper and nickel.
3. Exceedances were more widespread during periods of stormwater water runoff compared to dry weather
4. There was a tendency for exceedances to be more frequent at stations nearer the bottom end of watersheds, along the coast, and particularly in embayments such as Huntington Harbour and Newport Bay.

**Figures 11.1** and **11.2** visually summarize these regional patterns, using the data presented in **Table 11.2**.

Within these larger patterns, the CTR exceedance data help identify locations where targeted special studies to identify upstream sources should be implemented. The Third Term Monitoring Program has been designed to be adaptive to allow these special studies if warranted. These are stations where both the exceedance rate and/or the number of pollutants showing exceedances are among the highest:

Channels  
CMCG02  
SADF01  
SDMF05

Bays/Harbors  
HUNBCC  
HUNCRB  
HUNWAR  
TGDC05  
LNBHIR  
LNBRIN  
UNBCHB  
UNBJAM  
UNBNSB  
UNBSDC

Stations with elevated exceedance rates in dry weather tend to have elevated rates in wet weather as well. However, there is not a readily apparent, consistent relationship between the overall levels of CTR exceedances at the mass loading stations and the loads of total metals. For example, both stations CMCG02 and SDMF05 showed persistent exceedances of the saltwater CTR criteria (**Table 11.2**), yet **Figures 11.5** and **Figure 11.5a** show that these two stations have very different baseline mass loads of copper, nickel, and zinc. Improved understanding of the potential impact of these elevated pollutant levels will stem from the addition of toxicity testing to the Third Term Monitoring Program. This will help to identify where and to what extent such pollutants are more likely to be bio-available.

#### *Mass Emissions Monitoring*

The long-term mass emissions component of the monitoring program is intended to evaluate changes in stormwater pollutant loadings over a number of permit terms. This is accomplished through wet weather monitoring of a number of flood channels in the Newport Bay and Anaheim Bay-Huntington Harbour watersheds. Monitored constituents include nutrients, trace elements (total recoverable and dissolved), and for some channels, organophosphate pesticides. The program is coordinated with elements of the San Diego Creek Nutrient TMDL, a dry-weather assessment of the inorganic nitrogen and total nitrogen loading to the Newport Bay.

For the stormwater assessments three storms are monitored at each location annually and for each storm the water chemistry is monitored with a series of 3 to 4 composite samples collectively spanning approximately 96-hours. This time period frequently extends beyond the end of stormwater runoff but provides for comparison of the time-weight average concentrations of dissolved metals to the 96-hour guidance criteria for chronic aquatic toxicity from the CTR. The concentrations of dissolved heavy metals in each of the composite samples are also compared to acute toxicity criteria from the CTR.

The concentrations of organophosphate pesticides are compared to literature values of LC<sub>50</sub>s for toxicity testing organisms.

The dry-weather assessments usually involve a 24-hour composite sampling of the channels on a monthly basis. More frequent monitoring is also conducted at some stations for the Nutrient TMDL.

Mass Emissions monitoring during the Third Term Permit in the SAR was essentially an extension of monitoring conducted under the prior permits. Several sites, primarily in the Newport Bay watershed, have been monitored since the early 1990's. **Table 11.1** lists the mass emissions sites from which data were analyzed for this report.

The monitoring program utilizes continuous water level records from streamgages at each site are used to determine dry-weather and stormwater discharge rates. The streamgages on Costa Mesa, Central Irvine, and Lane Channels have not had sufficient numbers of stormwater discharge measurements made to accurately define the upper ranges of their respective channel ratings. To remedy this deficiency the program has recently invested in equipment utilizing acoustic Doppler current profiling technology in order to rapidly make discharge measurements during stormwater conditions.

The evolution of automatic sampling equipment and analytical methodologies has improved sampling efficiency and allowed more accurate assessments of potential aquatic toxicity. During the latter part of the 99-04 Monitoring Program Teflon-lined sampler tubing replaced plastic tubing to reduce the likelihood of cross contamination between samples. Detection limits of the analytical services providers improved dramatically for trace element and pesticide analyses.

The raw data for many constituents from the long-term mass loading stations in the Santa Ana Region (see **Figure 11.3** for the location of stations and **Figure 11.4** for an example raw data plot) show declining trends in event mean concentrations (EMCs) and loads over time. The legitimacy of these trends was investigated statistically<sup>2</sup> with a multiple regression analysis that included both the amount of rainfall in the three days preceding each sampling event and the amount of total suspended solids (TSS) in each sample. In order to increase the length of the time series back to the early 1990s, only total metals, phosphate (PO<sub>4</sub>), and nitrate (NO<sub>3</sub>) were used in the analysis.

The findings of this statistical analysis were as follows:

- There were no long-term trends in loads and event mean concentrations (EMCs) that were not accounted for by changes in TSS concentrations
- Mean levels of TSS differed among stations and so did underlying (baseline) levels of pollutants

The statistical analysis showed that the stormwater trends in metals, phosphate and nitrate concentrations were not a function of time but a function of TSS concentration.

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<sup>2</sup> Mark Fitzgerald, Neptune and Company Inc.

This would suggest that TSS reduction would result in a reduction of the other constituents. This makes logical sense for metals and phosphate which are predominantly found in particulate form in stormwater. For nitrate however, the TSS correlation is not readily explainable since nitrate is a dissolved component.

The underlying differences among stations in both EMCs and loads (after TSS influences were statistically removed) are shown in **Figures 11.5** and **11.6**. San Diego Creek at Campus (station SDMF05) has the highest loads for the three metals and two nutrients, probably a reflection of its consistently higher flow. On the other hand, the rank order of stations after this changes depending on the pollutant. There was no single station that was consistently among the highest ranked in terms of EMCs.

### 11.2.2 Approval of the Third Term Monitoring Plan

On July 1, 2003, the Permittees submitted to the Regional Board a monitoring program proposal to address the requirements of the Third Term Permit. The design of the program was based on The Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California, a report from the Southern California Stormwater Monitoring Coalition (SMC). The proposal contained several new assessment tools (relative to the 99-04 Plan) including expanded suites of monitored stormwater pollutants, dry-weather reconnaissance for illegal discharges/illicit connections, urban stream bioassessments, infaunal analyses of benthic sediment in the harbors and estuaries, and toxicity testing of water and benthic sediment. After lengthy discussions between the Permittees and Regional Board staff, the proposed monitoring plan was revised to incorporate several new elements to aid in the development of the Toxics TMDLs for San Diego Creek and the Newport Bay. The Executive Officer gave final approval of the plan in August 2005 and it was subsequently implemented.

While the 99-04 Plan has provided useful information with respect to regional patterns of water quality relative to the CTR and trends in stormwater EMCs and loads, the Third Term program will greatly expand the Permittees ability to assess the impacts of urban runoff. Since the Third Term program was implemented in August 2005 the Permittees have done the following:

- Conducted urban stream bioassessments in the Fall of 2005 and Spring of 2006
- Conducted toxicity testing of stormwater runoff at mass emissions and harbor/estuary sites
- Conducted infaunal analyses and toxicity testing of the benthic sediment in the Newport Bay and Huntington Harbour
- Initiated the weekly monitoring of bacterial indicators in coastal stormdrain discharges and their receiving waters
- Initiated the dry-weather reconnaissance program in May of 2006

Analysis of the data from this monitoring will be provided in the Performance Evaluation Assessment Report in November 2006.

### 11.2.3 Database Management

In 2004, a new computer program was developed for managing NPDES monitoring data. The intent of this program which has been called Labtrack, is to provide a single repository for all current NPDES data, to reduce the number of systematic errors in monitoring and laboratory analyses, and to increase the efficiency in processing invoices for the payment of analytical services. Some of the features of Labtrack include:

- Printing labels for sampling containers
- Printing and maintaining chain-of-custody documentation
- Checking laboratory results against quality assurance criteria
- Checking invoice pricing against price agreements
- Integrating discharge rate information from Hydstra (hydrologic database) to calculate load information for PEA and TMDL reports

### 11.2.4 Participation in Regional Monitoring Programs

Since 1997, the Permittees have been an active participant in the Regional Monitoring Program for the Southern California Bight. A Permittee representative has served on the steering committees for the 1998 Regional Assessment (Bight 98) and the 2003 Assessment (Bight 03). A representative has also served on several of the monitoring subcommittees on Bight 03.

The Permittees have also provided representation to the southern California Stormwater Monitoring Coalition. A Permittee representative was instrumental in the development of the Model Stormwater Monitoring Program guidance document mentioned in Section 11.2.2. A Permittee representative is currently on the working group with SCCWRP and the California Department of Fish and Game to improve the California Stream Bioassessment Procedure.

The knowledge gained from participation in these regional programs has enabled the Permittees to improve the monitoring program in many ways. The newly established price agreements for analytical services for the stormwater program required that the vendor had participated in the rigorous laboratory inter-calibration exercises for the Bight Regional Monitoring Program. These exercises, coordinated by SCCWRP, ensured that the accuracy and precision by each of the participating laboratories were maintained at a high standard.

### 11.2.5 Involvement in Research Level Investigations

The Permittees also contributed monitoring equipment and funding to UCI to conduct bacteriological investigations in the Santa Ana River and Huntington Beach surfzone. As a result of the study findings, the dry-weather discharges of several channels which drain to that area have been diverted to the Orange County Sanitation District. Since the diversions have been implemented there has been an improvement in scores for the surfzone in that area on Heal the Bay's Beach Water Quality Report Card.

### 11.3 Assessment

The Permittees have assessed the recently approved Third Term Permit Monitoring Program and are proposing no changes to this program.

The Permittees will continue to develop the capabilities to implement the program and assess the monitoring data to provide feedback to the management program. This will include the following:

- Continue to participate in Regional efforts to improve the quality and validity of stormwater monitoring data and provide a broader geographic context for monitoring results. These would include the Bight and SMC laboratory inter-calibrations, and Surface Water Ambient Monitoring Program (SWAMP) comparability studies.
- Continue to investigate improved GIS base data visualization tools for presenting monitoring information to a broader audience.
- Improve existing water quality database (Labtrack) to include automated report generation for:
  - Monthly updates to the Permittees pertaining to the Dry-weather Reconnaissance program
  - Quarterly data reports for the Nutrient TMDL
  - Integration of NPDES monitoring data with UCI's CalSWIM web-base GIS database
- Enhance training of monitoring staff by
  - Preparing standard operating procedures manuals for each monitoring program element
  - Providing opportunities for attending specialized training as provided by the USGS (streamgaging) and CaDFG (urban stream bioassessment)
- Evaluate new technologies for sampling and discharge monitoring

**Table 11.1: Mass Loading Stations Sampled During the Permit Term**

Site Code	Channel	NPDES	Nutrient TMDL	Comments
SDMF05	San Diego Creek at Campus	X	X	
BARSED	Peters Canyon Wash at Barranca	X	X	
WYLSER	San Diego Creek at Harvard	X	X	
SADF01	Santa Ana Delhi at Irvine Ave	X	X	
CICF25	Central Irvine u/s Peters Cyn Wash	X		New site under 3 <sup>rd</sup> term permit. Channel rating needs refining
BCF04	Bonita Cyn Wash u/s University		X	USGS gage
MIRF07	El Modena Irvine at Michelle		X	
LANF08	Lane Channel at Jamboree	X	X	Channel rating needs refining
ACWF18	Agua Chinon u/s San Diego Creek		X	USGS gage
CMCG02	Costa Mesa Channel at Highland	X	X	Channel rating needs refining
BCC02	Bolsa Chica at Westminster	X		
ABCC03	Anaheim Barber City at Rancho Rd	X		
WMCC04	Westminster Channel at Beach Blvd	X		
EGWC05	E. Garden Grove Wintersburg at Gothard	X		Gage removed during channel reconstruction 02-05

SECTION 11.0, WATER QUALITY MONITORING SUMMARY AND ANALYSES

**Table 11.2: Summary of Exceedances of Acute CTR Criteria Across the Region**

Weather	CTR Type	Site Code	Type	Watershed	# Samples	% Samples Exceeding CTR		
						Cu	Ni	Zn
Storm	FW	ABCC03	Channel	Anaheim Bay-Huntington Harbour	25	40	0	4
Storm	FW	BCC02	Channel	Anaheim Bay-Huntington Harbour	11	18	0	0
Storm	FW	EGWC05	Channel	Anaheim Bay-Huntington Harbour	18	45	0	0
Storm	FW	WMCC04	Channel	Anaheim Bay-Huntington Harbour	16	50	0	6
Storm	SW	BCC02	Channel	Anaheim Bay-Huntington Harbour	11	100	0	0
Storm	SW	EGWC05	Channel	Anaheim Bay-Huntington Harbour	18	100	0	6
Dry	SW	BBOLR	Harbor	Anaheim Bay-Huntington Harbour	11	55	0	0
Dry	SW	HUNBCC	Harbor	Anaheim Bay-Huntington Harbour	11	73	0	0
Dry	SW	HUNCRB	Harbor	Anaheim Bay-Huntington Harbour	11	82	0	0
Dry	SW	HUNSUN	Harbor	Anaheim Bay-Huntington Harbour	11	45	0	0
Dry	SW	HUNWAR	Harbor	Anaheim Bay-Huntington Harbour	11	64	0	0
Dry	SW	TGDC05	Harbor	Anaheim Bay-Huntington Harbour	8	88	0	0
Storm	SW	BBOLR	Harbor	Anaheim Bay-Huntington Harbour	7	43	0	0
Storm	SW	HUNBCC	Harbor	Anaheim Bay-Huntington Harbour	9	67	0	10
Storm	SW	HUNCRB	Harbor	Anaheim Bay-Huntington Harbour	9	56	0	0
Storm	SW	HUNSUN	Harbor	Anaheim Bay-Huntington Harbour	9	56	0	0
Storm	SW	HUNWAR	Harbor	Anaheim Bay-Huntington Harbour	9	44	0	0
Storm	SW	TGDC05	Harbor	Anaheim Bay-Huntington Harbour	5	80	0	0
Dry	FW	BARSED	Channel	Newport Bay	8	0	0	0
Dry	FW	BCF04	Channel	Newport Bay	5	0	0	0
Dry	FW	CICF25	Channel	Newport Bay	7	0	0	0
Dry	FW	CMCG02	Channel	Newport Bay	137	5	0	1
Dry	FW	HCWF27	Channel	Newport Bay	5	0	0	0
Dry	FW	SADF01	Channel	Newport Bay	10	20	0	0
Dry	FW	SDMF05	Channel	Newport Bay	82	0	0	0
Dry	FW	WYLSER	Channel	Newport Bay	9	0	0	0
Dry	SW	CMCG02	Channel	Newport Bay	137	99	1	1
Dry	SW	SADF01	Channel	Newport Bay	10	90	0	0
Dry	SW	SDMF05	Channel	Newport Bay	82	48	0	0

SECTION 11.0, WATER QUALITY MONITORING SUMMARY AND ANALYSES

Weather	CTR Type	Site Code	Type	Watershed	# Samples	% Samples Exceeding CTR		
						Cu	Ni	Zn
Dry	SW	LNBHIR	Harbor	Newport Bay	12	75	0	0
Dry	SW	LNBRIN	Harbor	Newport Bay	4	100	0	0
Dry	SW	LNBTUB	Harbor	Newport Bay	4	50	0	0
Dry	SW	UNBCHB	Harbor	Newport Bay	12	67	0	0
Dry	SW	UNBJAM	Harbor	Newport Bay	12	75	0	0
Dry	SW	UNBNSB	Harbor	Newport Bay	12	67	0	0
Dry	SW	UNBSDC	Harbor	Newport Bay	13	77	0	0
Storm	FW	ACWF18	Channel	Newport Bay	4	0	0	0
Storm	FW	BARSED	Channel	Newport Bay	61	5	0	0
Storm	FW	BCF04	Channel	Newport Bay	17	6	0	0
Storm	FW	CICF25	Channel	Newport Bay	8	13	0	0
Storm	FW	CMCG02	Channel	Newport Bay	58	48	0	26
Storm	FW	HCWF27	Channel	Newport Bay	7	0	0	0
Storm	FW	LANF08	Channel	Newport Bay	39	15	0	0
Storm	FW	MIRF07	Channel	Newport Bay	16	31	0	0
Storm	FW	SADF01	Channel	Newport Bay	57	28	0	0
Storm	FW	SDMF05	Channel	Newport Bay	50	4	0	0
Storm	FW	WYLSED	Channel	Newport Bay	52	2	0	0
Storm	SW	CMCG02	Channel	Newport Bay	58	97	0	22
Storm	SW	SADF01	Channel	Newport Bay	57	98	0	12
Storm	SW	SDMF05	Channel	Newport Bay	50	86	0	2
Storm	SW	LNBHIR	Harbor	Newport Bay	15	60	0	0
Storm	SW	LNBRIN	Harbor	Newport Bay	16	75	0	0
Storm	SW	LNBTUB	Harbor	Newport Bay	10	100	0	0
Storm	SW	UNBCHB	Harbor	Newport Bay	17	59	0	0
Storm	SW	UNBJAM	Harbor	Newport Bay	16	50	0	0
Storm	SW	UNBNSB	Harbor	Newport Bay	16	38	0	0
Storm	SW	UNBSDC	Harbor	Newport Bay	16	44	0	0

SECTION 11.0, WATER QUALITY MONITORING SUMMARY AND ANALYSES

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**Table 11.3 Summary of Exceedances of CTR Chronic Criteria in Harbors and Bays**

Weather	CTR Type	Site Code	Type	Watershed	# Samples	% Samples Exceeding CTR		
						Cu	Ni	Zn
Storm	SW	BBOLR	Harbor	Anaheim Bay-Huntington Harbour	4	75	50	0
Storm	SW	HUNBCC	Harbor	Anaheim Bay-Huntington Harbour	4	75	25	0
Storm	SW	HUNCRB	Harbor	Anaheim Bay-Huntington Harbour	4	100	25	0
Storm	SW	HUNSUN	Harbor	Anaheim Bay-Huntington Harbour	4	75	25	0
Storm	SW	HUNWAR	Harbor	Anaheim Bay-Huntington Harbour	4	100	0	0
Storm	SW	TGDC05	Harbor	Anaheim Bay-Huntington Harbour	3	100	33	0
Storm	SW	LNBHIR	Harbor	Newport Bay	7	86	29	0
Storm	SW	LNBRIN	Harbor	Newport Bay	6	100	50	0
Storm	SW	LNBTUB	Harbor	Newport Bay	4	100	75	0
Storm	SW	UNBCHB	Harbor	Newport Bay	7	86	29	0
Storm	SW	UNBJAM	Harbor	Newport Bay	8	100	25	0
Storm	SW	UNBNSB	Harbor	Newport Bay	8	75	50	0
Storm	SW	UNBSDC	Harbor	Newport Bay	7	71	29	0

Figure 11.1: Pattern of CTR Exceedances Across the Region During Dry Weather

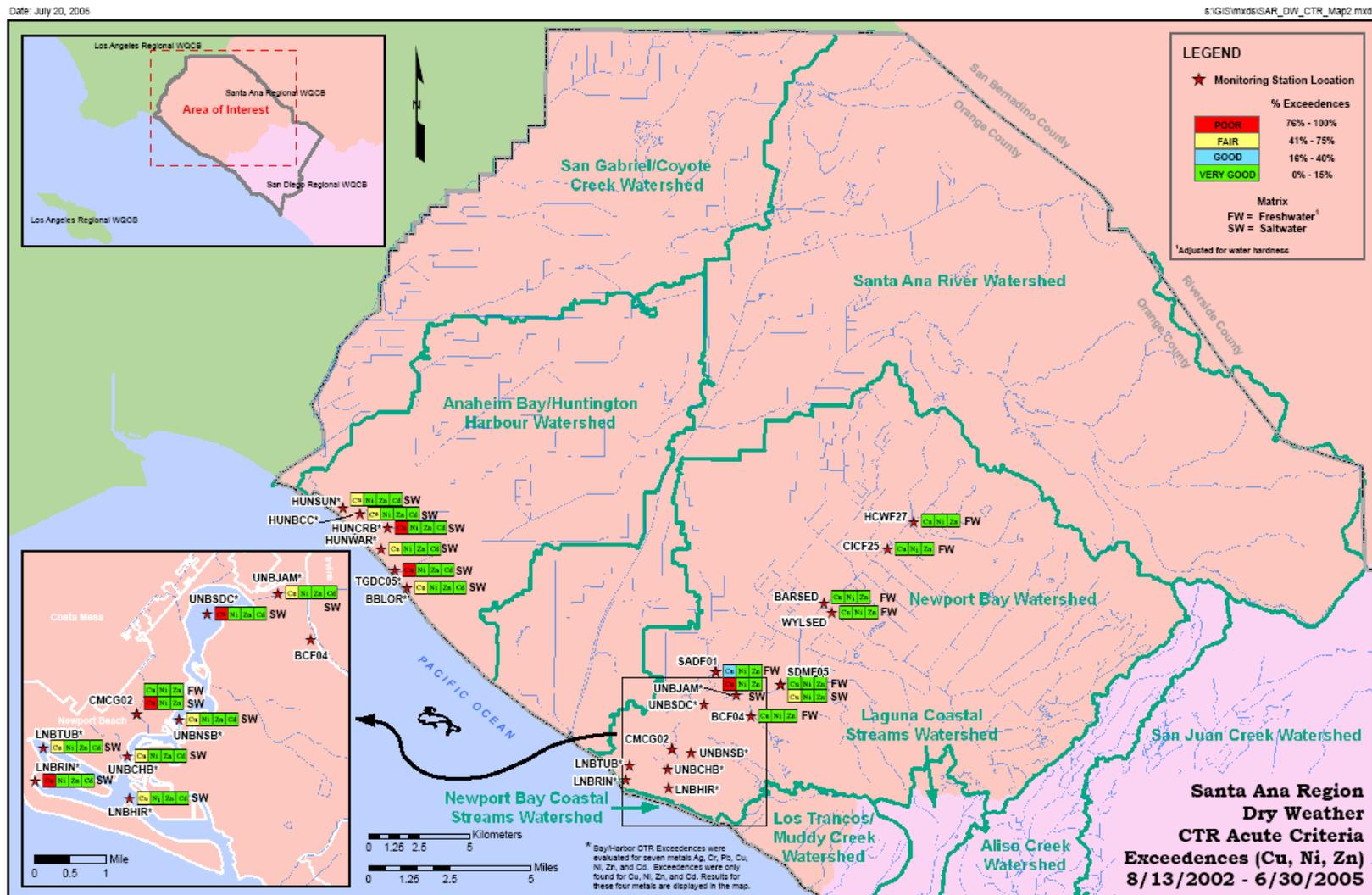


Figure 11.2: Pattern of CTR Exceedances Across the Region During Wet Weather

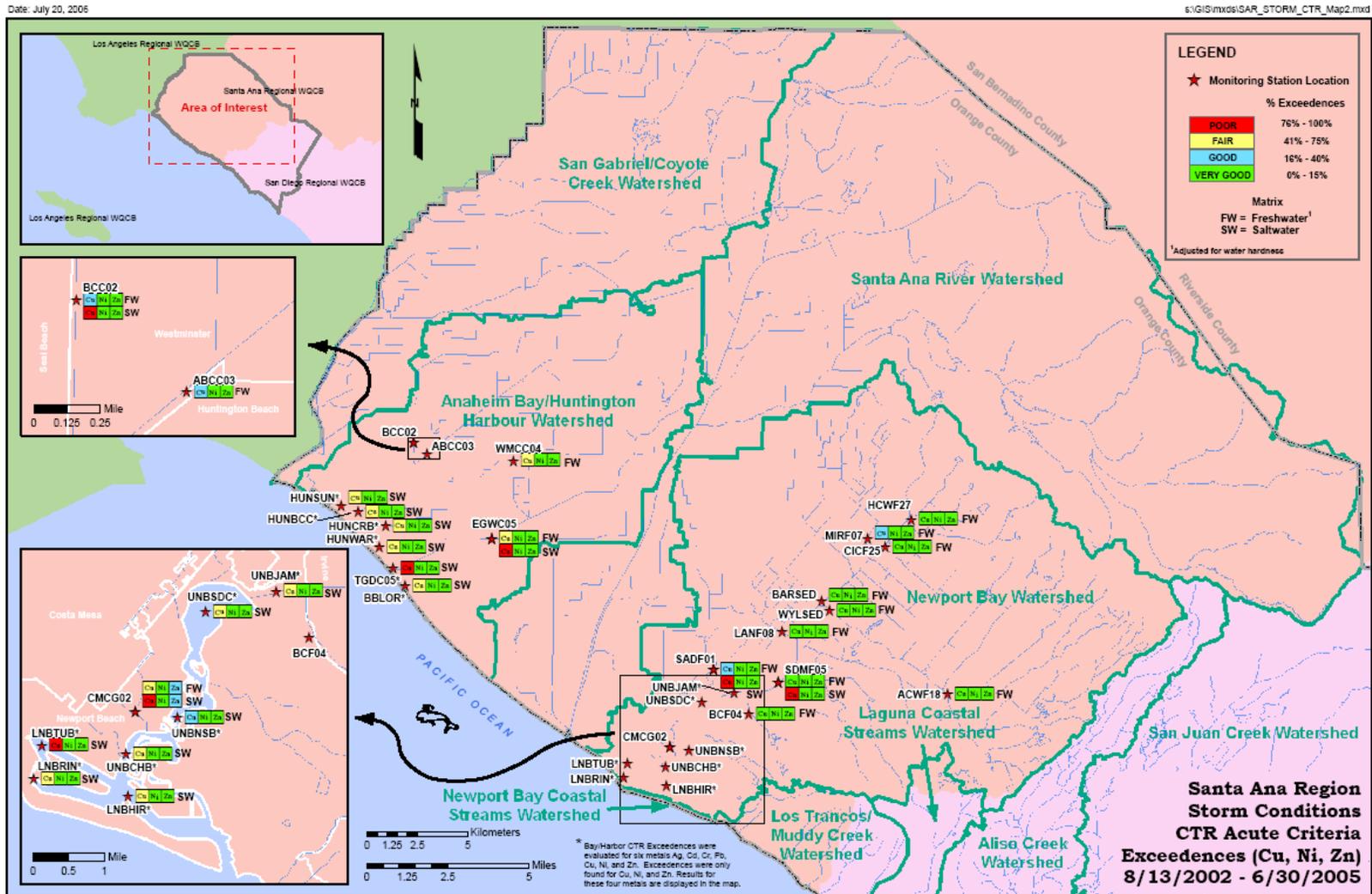
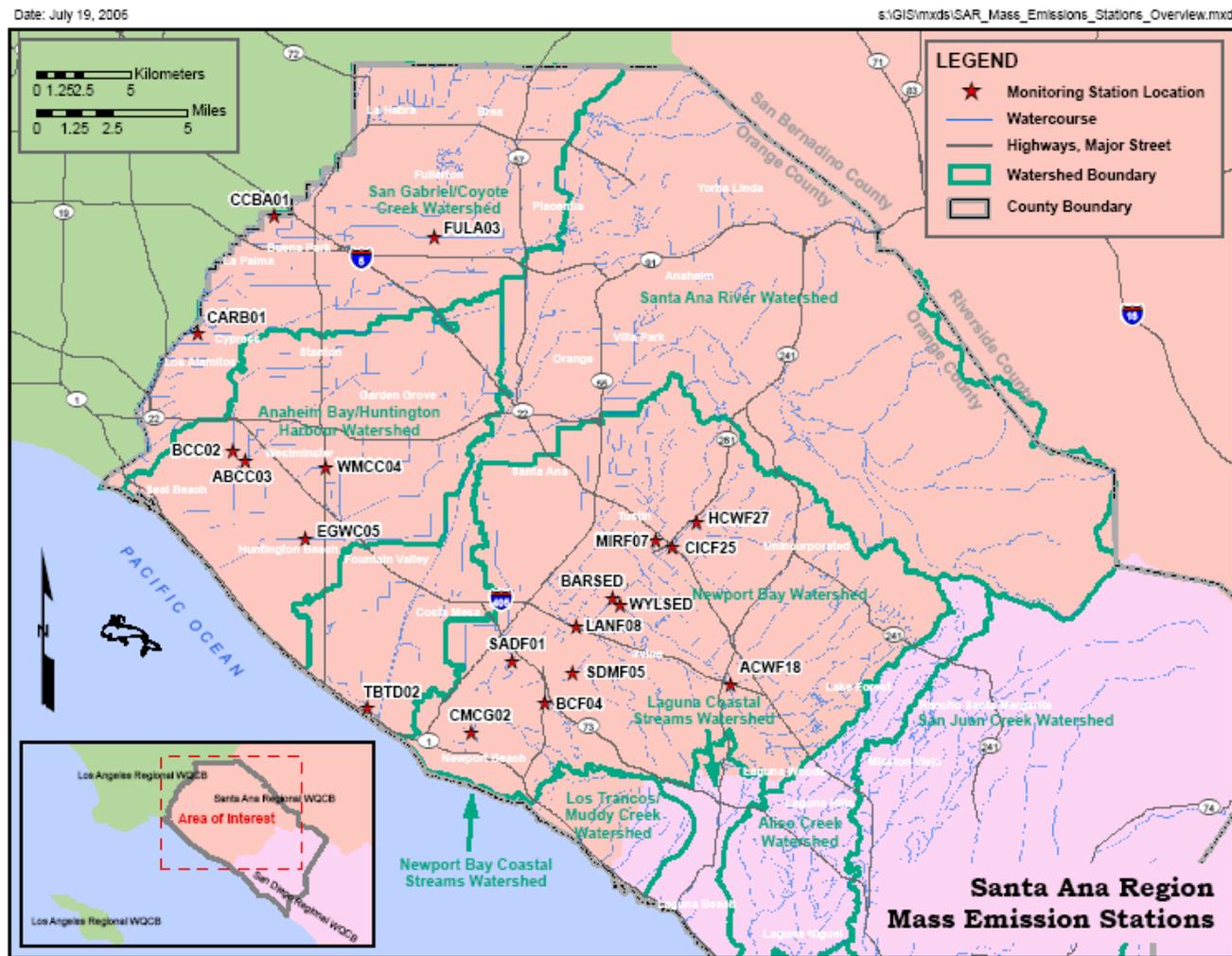


Figure 11.3: Location of the Long-Term Mass Loading Stations



New stations (CARB01, CCBA01, FULA03) are not included in retrospective analyses.

Figure 11.4: Illustrative Trends in Raw EMCs and Loads of Copper and Zinc at San Diego Creek at Campus (SDMF05)

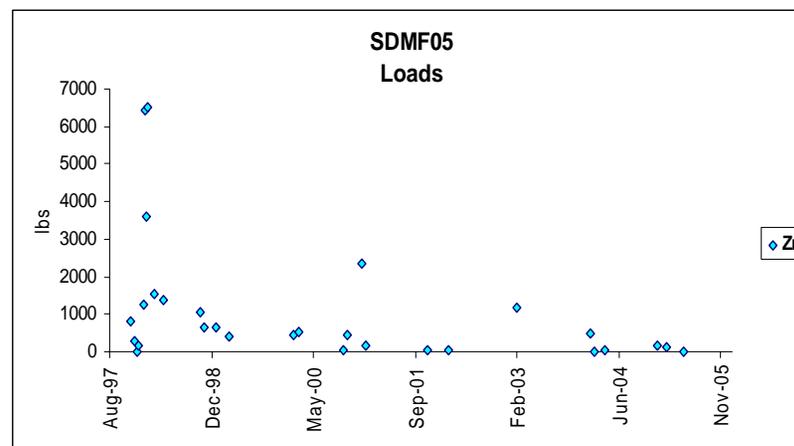
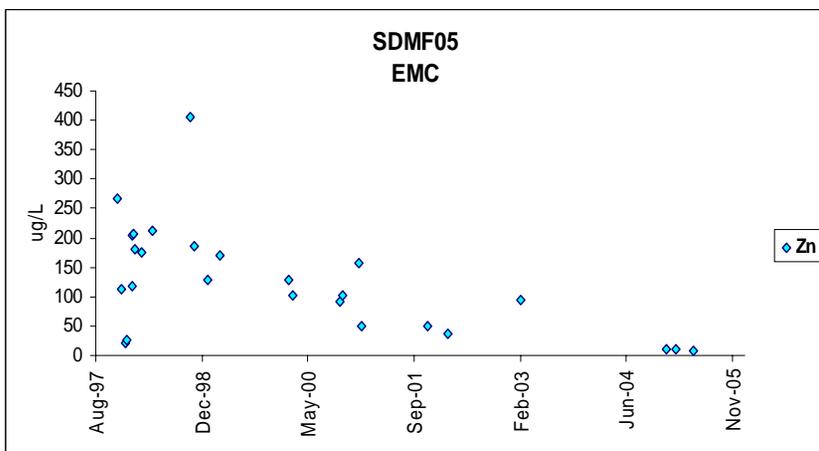
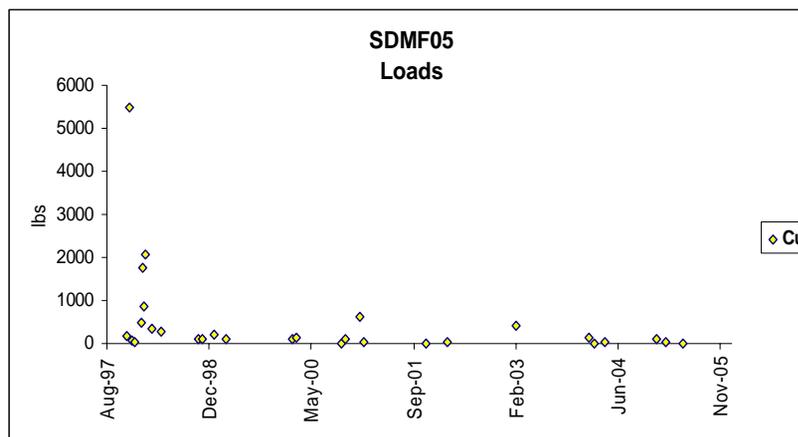
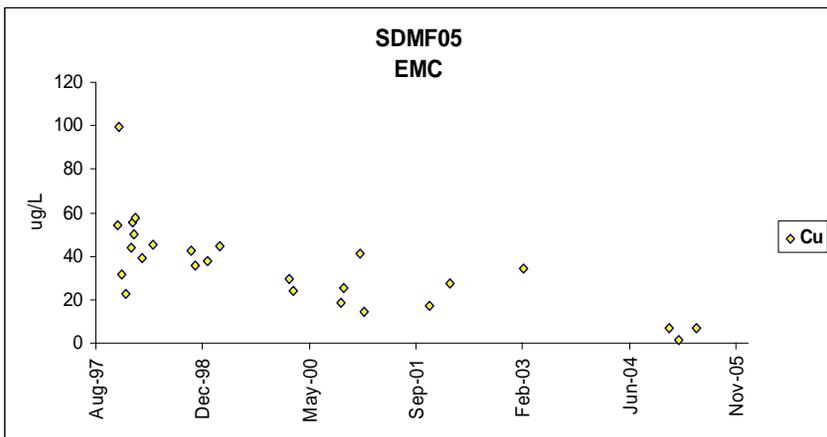
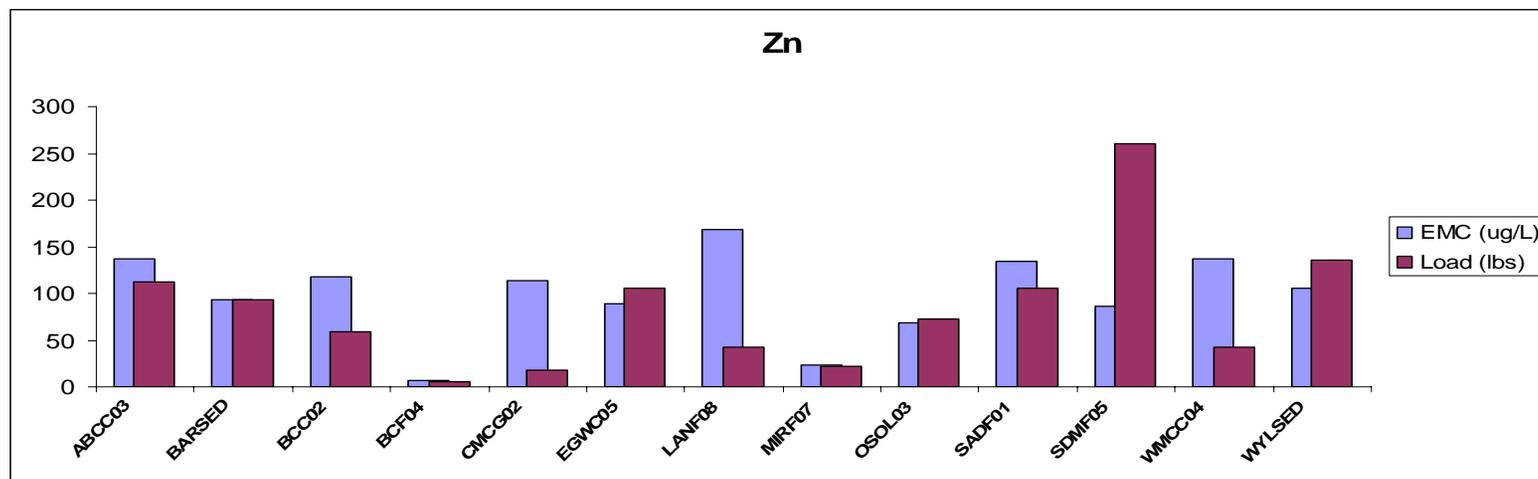
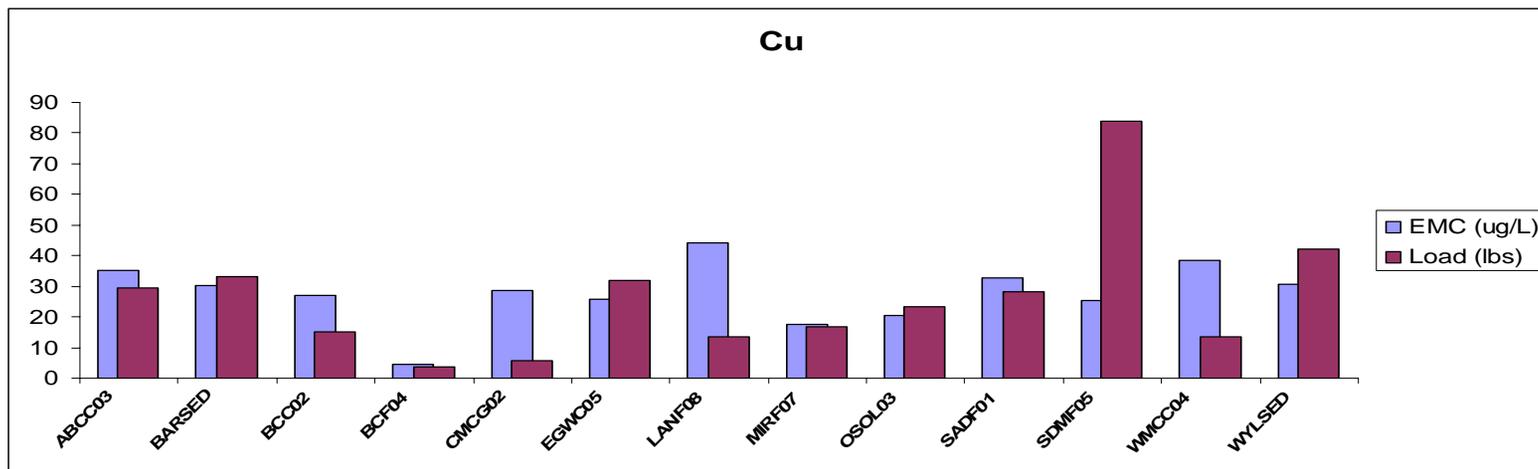
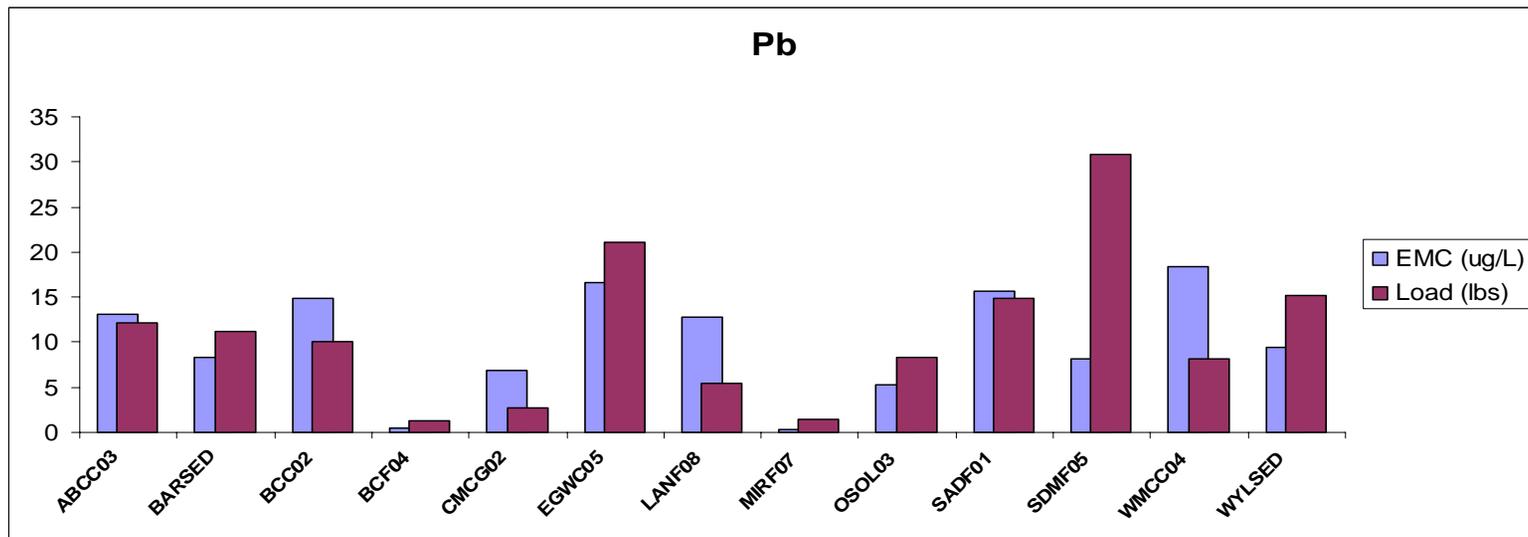


Figure 11.5a: Baseline Levels (Adjusted for TSS) of Total Metals at Long-Term Mass Loading Stations



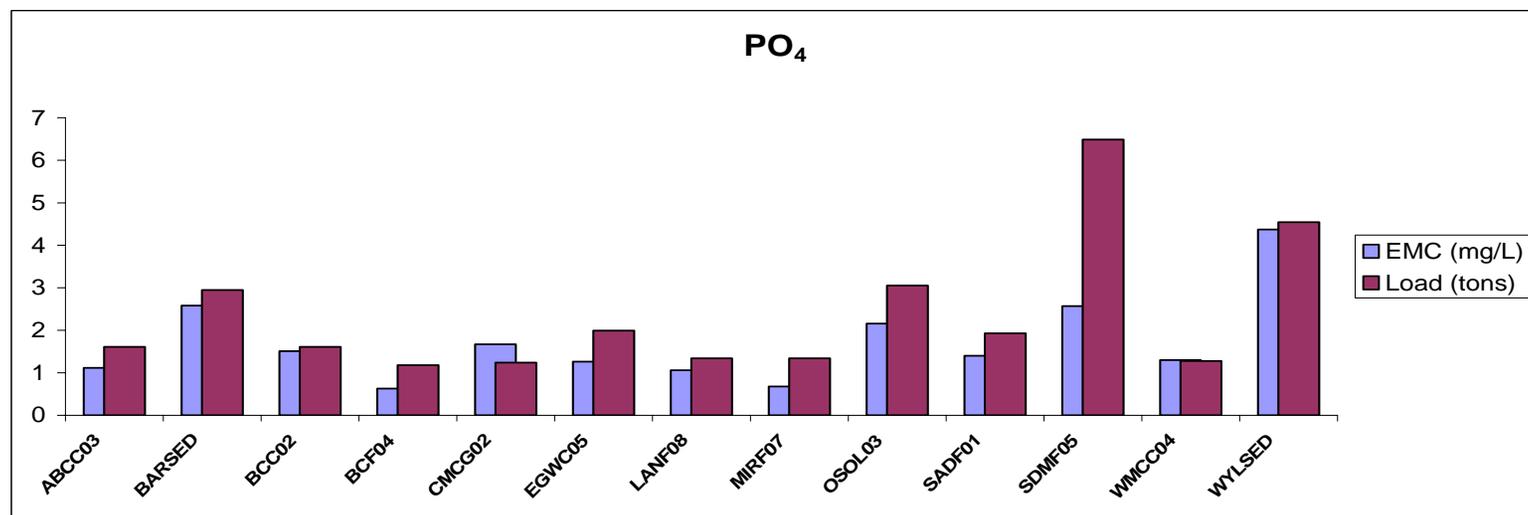
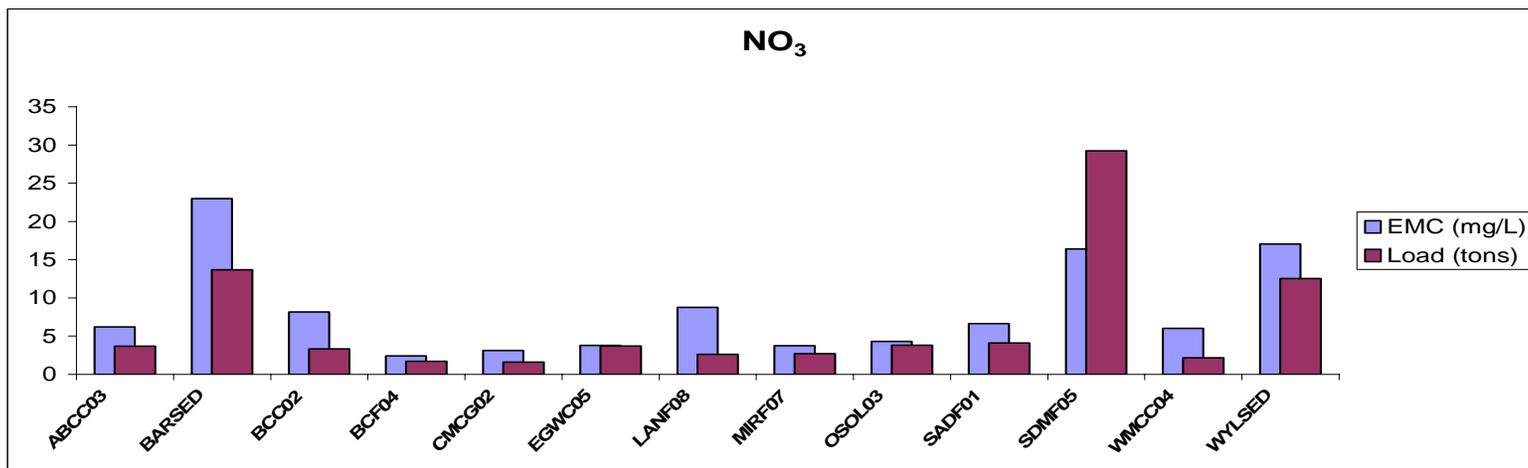
Loads are as pounds per sampling event.

Figure 11.5: Baseline Levels (Adjusted for TSS) of Total Metals at Long-Term Mass Loading Stations



Loads are as pounds per sampling event.

Figure 11.6: Baseline Levels (Adjusted for TSS) of Nutrients at Long-Term Mass Loading Stations



Loads are as tons per sampling event

**12.0 WATERSHED ACTION PLANS**

**12.1 Introduction**

The Third Term Permits have, with varying degrees of specificity, required the Permittees to develop and implement a watershed-based approach to urban stormwater management to complement the established jurisdictional-based approaches. In the area of the County under the jurisdiction of the San Diego Regional Board, Watershed Urban Runoff Management Plans (WURMPs) termed DAMP/Watershed Action Plans<sup>1</sup>, have been prepared for each of the six principal watersheds. In the Santa Ana Regional Board area of the County, which has a long history of watershed planning focused on the Newport Bay, the Permittees were required to update Appendix N of the DAMP to reflect the implementation measures and schedules related to the fecal coliform TMDL.

Watershed management is the term used for the approach to water quality planning that places an emphasis on the watershed (the area draining into a river system, ocean or other body of water through a single outlet) as the planning area and looks to multi-jurisdictional solutions to problems that cut across programs and jurisdictions. In Orange County, these efforts focus additional effort on the highest priority water quality constituents of concern in each watershed.

The approach taken to develop the DAMP/Watershed Action Plans recognizes that the jurisdictional DAMP/LIPs and the DAMP/Watershed Action Plans represent the principal policy and program documents for two separate, but nonetheless similar and highly interdependent, water quality planning processes targeting the control of pollutants in urban runoff (see **Section 3.0, 2007 DAMP**). There is also recognition that these efforts are, in many watersheds in Orange County, supportive of a third planning process that is focused on achieving broader objectives such as watershed habitat restoration and connectivity rather than specific water quality outcomes.

There are 5 distinct watersheds within the Santa Ana Regional Board area which are identified below:

<b>Region 8</b>	<b>Watershed Planning Area</b>	<b>Major Watercourses</b>
Santa Ana	San Gabriel River/Coyote Creek	Coyote, Carbon, Fullerton, and Brea Creeks
	Anaheim Bay/Huntington Harbour	East Garden Grove Wintersburg Channel/Bolsa Chica Channel
	Santa Ana River (within Orange County)	Talbert Channel, Santiago Creek and Santa Ana River
	Newport Bay	San Diego Creek , Santa Ana Delhi Channel

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<sup>1</sup> Previously termed DAMP/Watershed Chapters

	Newport Coastal Streams	Buck Gully, Los Trancos Canyon Creek, Muddy Canyon Creek
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**12.2 Accomplishments**

Through the current Permit term, these watersheds (**Figure 12.1**) have been the focus of a number of continuing environmental restoration and watershed-based water quality planning efforts.

**12.2.1 Environmental Restoration Planning Efforts**

- **San Gabriel River - Coyote Creek:** Coyote Creek - Lower San Gabriel River Watershed Feasibility Study:

The Army Corps of Engineers (ACOE) has commenced a Feasibility Study for the Coyote Lower San Gabriel River Watershed. The purpose and goal of the Study is to develop a rehabilitation plan and identify projects for ecosystem restoration, recreation, water quality improvement and resolve some flooding issues. The study will take approximately three years to complete and will be cost shared (50-50) by the Corps and the local sponsor (County of Orange). The watershed is divided between the County of Orange and the County of Los Angeles. Los Angeles County Department of Public Works has also agreed to contribute to the local cost share.

- **Anaheim Bay/Huntington Harbour:** Westminster Watershed Management Plan

The ACOE is undertaking a comprehensive study of the Westminster Watershed including the East Garden Grove-Wintersburg Channel and the Bolsa Chica Channel in order to develop a rehabilitation plan that will investigate flood control, ecosystem restoration, recreation, water quality and shoreline protection. The Feasibility Study Phase is estimated to cost a total of \$5,500,000 and will take approximately three years to complete.

- **Santa Ana River:** Orange Coast River Park

The goal of the project, being promoted by Friends of Harbors, Beaches and Parks, is to create a shared management structure and identity for a 1000+ acre park at the mouth of the Santa Ana River. At the Park’s upstream boundary, is Fairview Park located in the City of Costa Mesa. An extensive restoration project along with a proposed, water treatment and riparian habitat development is in the master plan for the park.

The Fairview Park Wetlands and Riparian Habitat Project include the restoration of approximately 30 acres containing the following four major design elements:

## SECTION 12, WATERSHED ACTION PLANS

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- 17-acre riparian habitat area;
- 5-acre area of water treatment ponds for water quality improvement and percolation;
- 13-acre area of upland habitat including a 2-acre public park; and
- Water delivery system to the ponds and riparian area from a modified pump station along the Greenville-Banning Channel.

Existing dry weather flows, currently being pumped to Orange County Sanitation District (OCSD) from nearby Greenville-Banning Channel, will be diverted into the wetlands where it will flow through a series of engineered wetland channels and infiltration ponds. Water diverted into the wetlands will be infiltrated into the groundwater or removed through evapotranspiration as well as support riparian habitat throughout the park. The completed project will include walking paths, flow diversion structures and bridges located amongst a series of streams and channels covered with thick wetland vegetation.

- **Newport Bay:** Upper Newport Bay Ecosystem Restoration Project

The project includes expanding and deepening the two In-Bay Basins and relocating a tern island from the upper basin to the lower basin. Restoration measures include wetland creation and restoring degraded habitat. In addition, the project will support sediment TMDL goals. The project is cost-shared with the ACOE. The cost apportionment for this ecosystem restoration project require Federal interests to provide 65% of the total costs, which is estimated to be \$38.4 million, and the County of Orange as the local sponsor to pay 35% through California Coastal Conservancy Bond funds. Dredging commenced in spring 2006.

- **Newport Bay:** Newport Bay/San Diego Creek Watershed Management Plan and Feasibility Study

The ACOE is conducting a study to develop a comprehensive framework to improve the health of the Newport Bay/San Diego Creek watershed. The process will address the protection and enhancement of watershed habitats, flood protection, water quality improvements, and reduction of erosion and sedimentation. A draft Newport Bay/San Diego Creek Watershed Feasibility Study Report was released in October 2005 and will be finalized in 2006-07.

### 12.2.2 Watershed-Based Water Quality Planning Efforts

- **San Gabriel River / Coyote Creek:** San Gabriel River Watershed Monitoring Workgroup

The Los Angeles County Sanitation District is required, as a condition of its NPDES Permit, to work with all agencies and interested parties in developing a watershed-wide monitoring program for the San Gabriel River Watershed. The project's ongoing planning and implementation is coordinated by the Southern California

Coastal Water Research Project (SCCWRP) and Brock Bernstein, PhD. A first round of sampling was completed in 2005 and a second round was completed in June of 2006. The County, as Principal Permittee, is participating in this workgroup which is facilitated by the Los Angeles River - San Gabriel River Watershed Council.

- **Santa Ana River:** Talbert Channel and Lower Santa Ana River Water Quality Diversions and Investigation

On October 15, 1999, the Santa Ana Regional Board issued a Section 13267 Directive to the County of Orange and five cities concerning bacteriological water quality impairments in the Talbert and Lower Santa Ana River watersheds that maybe affecting surfzone water quality. In response to the Regional Board's Directive, the County of Orange constructed dry weather urban runoff diversion projects in four flood control facilities [Huntington Beach Pump Station (D01PS1), Talbert Channel (D03), Santa Ana River (E01); and Greenville Banning Channel (D03)] for the diversion of all dry weather urban runoff in the Talbert - Lower Santa Ana River Watershed, an area of 16,575 acres. Similar diversion actions were taken by the City of Huntington Beach at a number of pump stations. The project goals were to divert dry weather urban runoff from the watershed year round and reduce the number of beach postings and closures due to high bacteria counts at the Huntington Beach State Beach.

On December 24, 2003, the Santa Ana Regional Board issued a second California Water Code Section 13267 letter to the County of Orange and five cities in the area of the Talbert and Lower Santa Ana River watersheds. The letter specifically requested a special investigation into any drains downstream of the diversions to determine if these non-diverted drains were contributing to bacteriological water quality impairments at Huntington State Beach. This letter was subsequently revised by the Regional Board on February 3, 2004 to rescind the 13267 requirements on two of the cities as their land area is entirely upstream from the point of diversion. The requested investigation was conducted in the Spring of 2004 and a full report was delivered to the Regional Board. The investigation determined that there were twenty one (21) non-diverted drains, but the majority did not show any evidence of discharge. In a September 10, 2004 letter from the Regional Board, a few drains were identified for follow-up investigations to ensure that no discharge was occurring. These follow-up investigations were conducted from 2004 through 2005 and a final report was delivered to the Santa Ana Regional Water Quality Control Board on July 29, 2005.

- **Newport Bay:** Nitrogen and Selenium Management Program

The Nitrogen and Selenium Management Program (NSMP) was launched by a group of watershed stakeholders, including all Watershed Permittees, in response to Order No. R8-2004-0021 (NPDES No. CAG998002) issued by the Santa Ana Regional Water Quality Control Board on December 20, 2004. Over the five year permit term, the NSMP Working Group is implementing a comprehensive work plan focusing on

developing watershed based management strategies for groundwater inputs of selenium and nitrogen in the Newport Bay watershed. This work plan has been approved by the Executive Officer of the Santa Ana Regional Board and the key elements of the work plan include, (1) collecting additional data to fill knowledge gaps regarding the movement and impacts and selenium and nitrogen in the watershed, (2) examining Best Management Practices (BMPs) and treatment technologies that can reasonably and effectively be applied in the watershed, (3) developing an offset, trading, or mitigation program for both selenium and nitrogen, (4) using the increased knowledge and treatment opportunities developed in previous tasks to evaluate the Nutrient TMDL, and (5) if appropriate, develop a site specific objective for selenium.

The National Water Research Institute (NWRI) has assembled an independent advisory panel to evaluate key work products and provide recommendations to the NSMP Working Group. In particular, the independent advisory panel will be providing a recommendation on whether or not a site specific objective for selenium is appropriate for the Newport Bay watershed.

In addition to entities regulated by the permit, the Santa Ana Regional Water Quality Control Board, Orange County Coastkeeper, and Stop Polluting Our Newport (Dr. Jack Skinner) are serving as Participatory Members of the NSMP Working Group. As Participatory Members, these three entities are providing key public input and feedback to the NSMP Working Group but are not financially responsible for implementing the work plan.

The NSMP Working Group currently consists of twenty members:

- o County of Orange
- o Orange County Flood Control District
- o City of Costa Mesa
- o City of Irvine
- o City of Laguna Hills
- o City of Laguna Woods
- o City of Lake Forest
- o City of Newport Beach
- o City of Orange
- o City of Santa Ana
- 11. City of Tustin
- 12. California Dept. of Transportation
- 13. Irvine Ranch Water District
- 14. The Irvine Company
- 15. Golden State Water Company
- 16. Tustin Legacy Community Partners
- 17. Lennar
- 18. The Great Park Corporation
- 19. Nexus Construction Services
- 20. Maguire Properties

In a separate, but related effort, the Newport Bay Watershed Permittees, the Irvine Ranch Water District, and The Irvine Company funded a special study in the San Joaquin Marsh and San Diego Creek to investigate concentrations of selenium in key parts of the food web, including benthic invertebrates, plants, sediment, and water. The study was conducted by Dr. Alex Horne and the final report has been completed.

- **Newport Bay:** Newport Bay Watershed Nutrient Total Maximum Daily Load

(TMDL)

The nutrient TMDL establishes targets for reducing the annual loading of nitrogen and phosphorus to Newport Bay by 50% and meeting the numeric and narrative water quality objectives by 2012. To achieve these targets, the TMDL establishes a number of interim targets requiring a 30% and 50% reduction in nutrients in summer flows by 2002 and 2007, respectively, and a 50% reduction in non-storm winter flows by 2012.

The Newport Watershed Permittees have evaluated compliance with the TMDL targets (Newport Bay Watershed TMDL Compliance Evaluation, Tetra Tech, July 2000). The report indicated significant compliance with the 2002 targets and slight nutrient loads in excess of the future targets. It concluded that current programs are working and that further minor program revisions will achieve all TMDL targets.

The findings of the compliance studies are further supported by nutrient loading studies that were conducted by the Principal Permittee in September 1999, June 2000, May 2001, and May 2003. These studies demonstrate compliance with the 2002 target based on extrapolation of the data collected to date. This assessment was verified when analysis of the summer 2002 water quality data illustrated the reduction of nutrient loading in the Newport Bay watershed was greater than the 30% reduction target.

In February 2000, the Principal Permittee on behalf of the Watershed Permittees, initiated the Regional Nutrient Monitoring Program (RMP) for the Newport Bay and its watershed pursuant to the requirements established by the Santa Ana Regional Board (Resolution 99-77 to establish an RMP pursuant to the TMDL). Annual data analysis reports have been submitted each November to document watershed nutrient concentrations and loadings, algal biomass and bay nutrient concentrations. Analysis of the RMP watershed and bay data indicate compliance with the 2002 and 2007 TMDL targets. At the request of the Regional Board, beginning in 2006, the Principal Permittee will begin submitting quarterly data analysis reports and data transmittals.

In addition to the routine watershed and bay monitoring, the RMP requires several special studies to be conducted. Progress on the special studies is described below.

- Newport Bay Watershed Nutrient TMDL – Dissolved Oxygen (DO) and Algae Distribution Grant Study

In March 2005 the Principal Permittee on behalf of the Watershed Permittees was awarded a \$250,300 Prop. 13 grant from the State Water Resources Control Board to conduct The Newport Bay Nutrient TMDL DO and Algae Distribution Study. The study characterized the dissolved oxygen and macroalgae regimes of Upper Newport Bay (UNB) by completing two special investigations identified in the Nutrient TMDL RMP. First, the spatial and temporal extent of hypoxia/anoxia

in UNB will be determined. Then, to determine if there is a quantitative relationship between intertidal macroalgal abundance and the frequency of hypoxic events, macroalgal abundance will be estimated using remote sensing techniques during the period of deployment of DO sensors in UNB. These data are essential in determining the relationship, if any, between hypoxia/anoxia and macroalgal abundance. A final report is due at the end of October 2006.

- Newport Bay Watershed Nutrient TMDL – Urban Nutrient Special Investigations

A Proposition 13 grant was received in 2003 to fund a characterization study of the sources and magnitude of urban nutrient loading. The specific study objectives were to: (1) Quantify nutrient loading of dry weather runoff from urban residential and business areas which drain to Upper Newport Bay; (2) Identify and characterize runoff quality of specific urban activities and sources which contribute to urban nutrient loading from each study area, and (3) Estimate to what extent urban runoff quality may be influenced or compromised by infiltration of shallow groundwater into the drainage network. The grant amount was \$295,000 with \$100,000 matching funds from the Watershed Permittees. Field work for these investigations was completed in 2004, and draft final reports of research findings and project accomplishments were completed in the spring of 2006.

Mean TIN areal loading rates ranged between 0.029 – 0.415 lb/acre-year across study areas, while TN loading rates ranged between 0.242 – 1.228 lb/acre-year. Mean TP areal loading rates varied between 0.019 - 0.232 lb/acre-year. Areal loading rates were substantially lower in the Costa Mesa study areas than in the San Diego Creek watershed study areas for all three parameters. There was no apparent meaningful difference between loading based on land use (residential vs. business).

Findings in the Como Channel study area demonstrated that dry weather discharge and related contaminant loadings from confined pipe systems in areas of the San Diego Creek watershed should not be presumed to be exclusively from surface runoff. It was conclusively demonstrated that shallow groundwater infiltration into the storm drain system contributed 27% of dry weather discharge from the study area, and comprised a disproportionately high 84% of the NO<sub>3</sub>/NO<sub>2</sub>-N load of what was ostensibly an urban area discharge. This finding likely applies to all urban areas which overlie the nitrate-rich shallow groundwater area in the center of the San Diego Creek - Peters Canyon Wash watershed.

- **Newport Bay:** Newport Bay Watershed Sediment TMDL

The TMDL allocation for sediment in the Newport Bay Watershed was approved in March 1999. The objectives of the TMDL are to reduce the annual average sediment

load in the San Diego Creek watershed from a total of 250,000 tons per year to 125,000 tons per year, thereby reducing the sediment load to Newport Bay to 62,500 tons per year and limiting sediment deposition in the drainages to 62,500 tons per year within 10 years (a 50% reduction) and to lower the frequency of dredging within the Bay.

To comply with the sediment TMDL, an annual report has to be submitted to the Santa Ana Regional Board by November 15 of each year verifying that the basins have at least 50% capacity and an annual compilation of sediment monitoring data and TMDL compliance analysis is required by February 27 of each year.

In general, the available data suggests that sediment loads in the San Diego Creek watershed have been reduced significantly from rates recorded in the pre-TMDL period. Since implementation of the TMDL, the average suspended sediment load measured at San Diego Creek at Campus Drive has been approximately 55,360 tons per year.

- **Newport Bay:** Newport Bay Watershed Fecal Coliform TMDL

The fecal coliform TMDL establishes a long-term, prioritized, phased approach to meeting recreational contact (REC1) and shellfish harvesting (SHELL) water quality standards in Newport Bay. In response to the 13267 letter, dated January 7, 2000, from the Santa Ana Regional Board, the Newport Watershed Permittees, IRWD and The Irvine Company are currently supporting studies and monitoring in the Bay that are expected to result in the development of a TMDL implementation plan.

To date, work has been carried out in a collaborative manner by the Newport Watershed Permittees with technical support from the Irvine Ranch Water District and their consultants, Eisenberg, Olivieri and Associates (EOA) and Resource Management Associates (RMA). In September 2001, EOA and RMA issued their final report entitled Public Health Risk Assessment for the Newport Bay Watershed: Recreational Contact and Microbial Risk. Reported findings are that exceedances of Basin Plan fecal coliform objectives for REC-1 beneficial use are temporally sporadic and geographically limited and that they generally occur during the time of year when REC-1 use is low or in areas of the bay where the level of body contact recreation is low or prohibited. Additionally, the risk of enteric viral disease from body contact recreation in Newport Bay is well below EPA's "accepted illness rate" of 19 illnesses per 1,000 swimmers for recreation in marine waters. The report also indicates that the urban runoff identified in the Clean Water Act 303(d) listing as the likely source of pathogens in Newport Bay do not substantially impact the risk to public health from body contact recreation.

A Proposition 13 Grant has been obtained to conduct a set of field studies that will provide data necessary to identify and prioritize urban and natural sources of fecal coliform to the Bay. This data will provide the basis for the formulation of a Fecal Coliform Source Management Plan needed to implement the fecal coliform TMDL

for Newport Bay. The field studies are designed to provide information on Bay-wide impact of fecal indicator bacteria from urban and natural sources, measurement and prioritization of specific urban sources in Lower Bay, estimates for the magnitude and kinetics of within-Bay natural sources and processes that affect the concentration of fecal indicator bacteria in the water column, and information on the community structures and species abundance of *Enterococcus* and relatedness of *E. Coli* strains in the bay. The grant award amount for the studies is \$780,000 with a \$50,000 match provided by the Watershed Permittees and others.

- **Newport Bay Fecal Coliform TMDL - Shellfish Harvesting Beneficial Use Assessment**

The shellfish harvesting beneficial use assessment was initiated in 2003 with the goal of developing recommendations for prioritizing areas within Newport Bay for purposes of evaluation and implementation of cost-effective and reasonable control actions. The primary objectives of the assessment are to: 1) Identify historic areas of bivalve mollusk shellfishing (shellfishing) in Newport Bay; 2) Establish the existing level of the shellfishing resource in Newport Bay; 3) Characterize current levels of shellfish collection (for consumption and bait) as a beneficial use in Newport Bay; 4) Investigate impediments to, and the possibility of enhancing the potential for, increased levels of shellfish collection in Newport Bay, and; 5) Document the results of the investigation in a manner that will be useful to the Regional Board for decision-making purposes.

Both qualitative and quantitative surveys were conducted to identify the current extent of intertidal shellfish resources in Newport Bay. The results of these surveys indicate large differences in the composition and abundance of shellfish in Lower Newport Bay compared to Upper Newport Bay. Shellfish species that are of potential interest to shellfisherman for consumption are predominantly located in Lower Newport Bay, despite the fact that this region has only 5 percent of the intertidal habitat found in Upper Newport Bay.

Two major factors were identified that prevent utilization of this resource by shellfishermen. The most significant is that the populations were found almost exclusively in areas with eelgrass. These areas are not open to shellfishing since Section 30.10 under Title 14, Chapter 4, Article 1 of the California Code of Regulations prohibits cutting or disturbance of eel grass. A second factor was the size composition in the Bay. Only three out of 419 littleneck clams collected from Lower Newport Bay met the legal minimum size of 38.1 mm (1.5 inches) under California's Ocean Fishing Regulations. One-third of the Venus clams that were collected from this region met the size limits for harvesting but overall abundances were 25% of the littleneck clam population. Many factors may have influenced the size composition of littleneck clams including possible differences in annual recruitment and survival of littleneck clams over the past five to 10 years.

The beneficial use data collection program surveyed 1,100 individuals. Over 99% of those respondents who collect shellfish in Newport Bay reported doing so for fishing bait. Mussels collected from piers, pilings, and docks are the most common shellfish targeted by fishermen. On rare occasions, fishermen were also observed to use clams as bait. Only two individuals interviewed reported that they had consumed shellfish. In both cases, the shellfish collected and consumed were mussels. Based upon the beneficial use surveys, it is clearly evident that intertidal clam populations in Newport Bay are not currently being used for human consumption.

The cost of the Beneficial Use Assessment was \$453,000 provided by the Watershed Permittees and others.

- **Newport Bay:** Newport Bay Watershed Toxics TMDL

On June 14, 2002, EPA Region 9 established the Toxics TMDL for the Newport Bay Watershed. The Santa Ana Regional Board is currently splitting the EPA promulgated Toxics TMDL into five separate constituent and geographically specific TMDLs. The five resulting TMDLs will include (1) diazinon and chlorpyrifos, (2) organochlorine compounds, (3) selenium, (4) metals, and (5) Rhine Channel. Each of these individual TMDLs must proceed through the full approval process before they are officially adopted and made a part of the Basin Plan. Currently, the only TMDL to complete the approval process is the diazinon and chlorpyrifos TMDL. The Santa Ana Regional Board approved an amendment to include the diazinon and chlorpyrifos TMDL on April 4, 2003.

A Pesticide Research and Identification of Source and Mitigation (PRISM) grant was received in 2005 to evaluate legacy organochlorine pesticide mass loadings with respect to geographic location, flow, sediment particle size, and total organic carbon within the watersheds. The information gathered by the study will assist with the evaluation of waste load allocations and the development of an implementation plan for the Organochlorine Compounds TMDL. The PRISM Grant provides \$188,254 for this study with a match of \$9,906 by the Watershed Permittees and others.

Samples from approximately five storms were collected during the 2005-06 storm season (September - April). Storm and dry season sampling will conclude in 2006 with a final report due in 2007.

- **Newport Coastal Streams:** City of Newport Beach Initiatives

The Newport Coast Watershed area covers about 10 square miles and eight coastal canyons it extends south of Corona Del Mar in Newport Beach to El Morro Canyon in Crystal Cove State Park. Two of the canyons are 303(d) listed and the entire watershed drains to one of two ASBS's (the Newport Beach Marine Life Refuge and/or the Irvine Coast Marine Life Refuge). The following actions are under way by the City of Newport Beach to address canyon degradation, ASBS concerns and

the 303(d) listing:

- Initiated a erosion control project in Buck Gully;
- Performing canyon stability inspections of Buck Gully, Los Trancos and Muddy Creek;
- Preparing a Watershed Management Plan for each of the eight canyons;
- Performing a series of investigations to determine primary sources of degradation to the ASBS's (Public Use Study, Canyon flows and water quality, cross contamination investigation from Newport Bay);
- Reducing negative impacts to the two Marine Life Refuge Areas (ASBS's) by reducing unnatural dry-weather canyon flows and improving storm-flow water quality;
- Working with IRWD, Coastkeepers, California Department of Parks and Surfriders to expand educational and training programs and expanding the City's Tide Pool Ranger Program;
- Implementing a continuing program of flow and water quality monitoring for the canyons;
- Implementing a suite of canyon water quality BMP's (wetland improvements, native plantings, grade control structures, retention basins, a watershed ET controller retrofit program), and
- Implementing a series of structural and non-structural BMP's (increased WQ enforcement, increased street sweeping, installation of catch basin screens, and educating the community relative to over-watering and runoff)

In addition, the following actions have been completed:

- A canyon stabilization project in Morning Canyon;
- A draft groundwater seepage study;
- A draft Landscape and Irrigation Ordinance (to be reviewed with City Council), and
- A Runoff Reduction Program to address dry-weather runoff.

### 12.3 Assessment

Four separate, but nonetheless highly interrelated, planning processes have continued to develop through the period of the Third Term Permits. These processes are (1) DAMP/LIP focused Countywide implementation of a baseline of BMPs, (2) DAMP/Watershed Action Plan focused on enhanced BMP implementation targeting specific constituents of concern, (3) IRWD's Natural treatment system designed to treat dry weather runoff with man-made wetlands. The natural treatment system will rely on natural ecosystems to remove sediment, nutrients, pathogens and other contaminants from the runoff and prevent these contaminants from reaching Upper Newport Bay, and (4) a process that is focused on achieving broader objectives such as watershed habitat restoration and connectivity rather than specific water quality outcomes. The first three processes align with the CWA's interim goal, which is to attain water quality sufficient to provide for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water. The third process aligns with the overarching objective of the CWA which is to restore and maintain the chemical, physical

and biological integrity of the nation's waters. While the interim goal is subordinate to the broader objective, it nonetheless continues to be the primary focus of the Permittees efforts since it is the basis of the long-established NPDES permitting framework to which the Permittees, as a consequence of Section 402(p) of the CWA, are subject.

### 12.3.1 Environmental Restoration Planning Efforts

The Permittees' environmental restoration efforts focused on ecological outcomes are broad stakeholder initiatives rather than permit compliance driven planning processes, and are predominantly cooperative projects with the ACOE. Federal funding of ACOE watershed management and restoration initiative will continue to be a major determinant of progress with respect to these planning efforts.

### 12.3.2 Watershed-Based Water Quality Planning Efforts

The Permittees' watershed-based water quality planning efforts are focused on water quality standard attainment; involve the Permittees and other regulated entities, and represent collective and cooperative compliance efforts. In the Santa Ana Regional Board area of Orange County, TMDL promulgation (first addressed in **Appendix N** of the **DAMP**) has resulted in two regulatory approaches, specifically (1) California Water Code 13267 Directives and (2) the incorporation TMDL provisions for nutrients and fecal coliform in the Newport Bay Watershed into the Third Term Permit. The Permittees' response to (and full compliance with) these regulatory initiatives has preceded the development of **DAMP/Watershed Action Plans**. In south Orange County the reverse situation has occurred since the specific WURMP requirements of the Third Term Permits have preceded TMDL development and implementation and led to the creation of six DAMP/Watershed Action Plans. These plans are deemed to usefully provide:

- A holistic account of all water quality protection and management activities in the watershed;
- A basis for developing establishing and communicating common goals for the watershed with an action plan to achieve them, and
- A framework for monitoring and assessing the progress of projects individually and cumulatively at the watershed scale.

**ROWD Commitment**

- Complete **DAMP/Watershed Action Plans** for all 11 Orange County watersheds (See Appendix A: Model Watershed Action Plan prepared as Newport Bay Watershed Action Plan<sup>2</sup>).

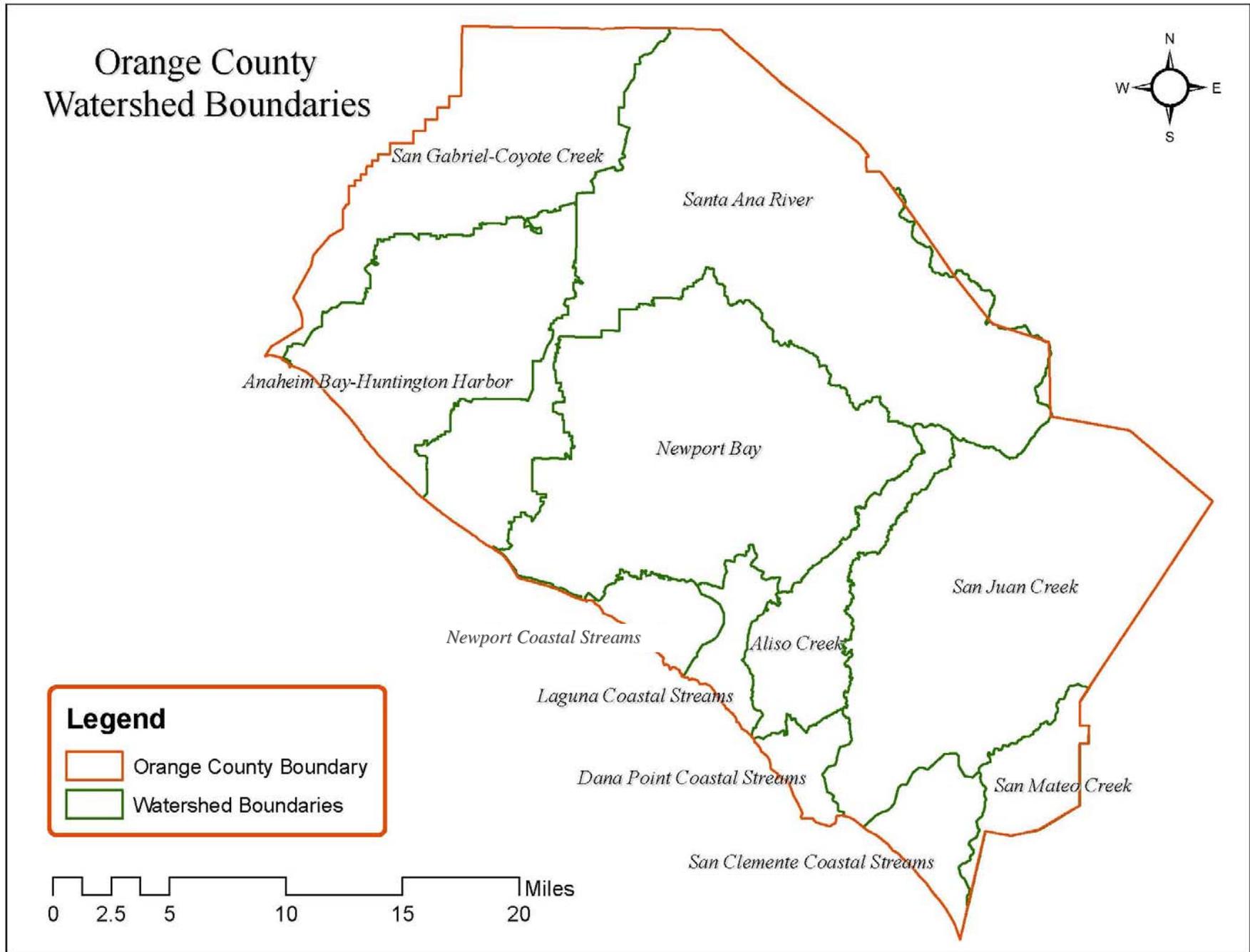
**12.4 Summary**

The watershed-based approach to water quality planning has been advocated by many constituencies for over 30 years. In Orange County, this approach has been the basis of efforts to protect and manage Newport Bay, notably for sediment, for almost the same period of time. With the completion of **DAMP/Watershed Action Plans** for the south Orange County watersheds and with a number of areas of Orange County facing TMDL implementation over the period of the Fourth Term Permits, these documents essentially represent implementation plans for urban sources of constituents of concern.

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<sup>2</sup> The Newport Bay Watershed Action Plan is being presented as a Model DAMP/WAP. It will be presented as a final document with the Annual Progress Report in November, 2006.

Figure 12.1



## 13.0 SUMMARY

### 13.1 Introduction

From the various sources of information that were used to evaluate program effectiveness, three themes have emerged that frame the Permittees approach to developing the proposed 2007 DAMP. These themes are:

Demonstrating the iterative management approach: Adapting the management program to more effectively address urban sources of pollutants that are causing or contributing to exceedances of water quality standards;

Enhancing Implementation: Improving program implementation through incorporation of auditable environmental management system concepts; and,

Establishing watershed-based water quality planning: On a Countywide basis, creating two separate, but nonetheless highly inter-related, water quality planning processes to address urban sources of pollutants.

Each of these themes is the basis for two types of programmatic recommendations, specifically (1) ROWD Commitments (new programmatic commitments to be developed and implemented over the period of the Fourth Term Permits) and (2) DAMP Modifications (improvements to existing program commitments incorporated into the proposed 2007 DAMP).

### 13.2 Demonstrating Iterative Management

#### ROWD Commitments:

- Develop Model Integrated Pest Management, Pesticide and Fertilizer Guidelines into a Model Program (rather than guidelines) with implementation goals and including model contract language (see **Section 5.3.2**).
- Develop recommendations for the selection and installation of drain inlet screens (see **Section 5.3.3**).
- Develop model language for municipal trash collection and haulage contracts that address water quality protection issues (see **Section 5.3.3**).
- Develop and implement BMPs for architectural uses of copper and zinc (see **Section 7.3.1**).

### 13.3 Enhancing Implementation

#### ROWD Commitments:

- Prepare a training schedule and define expertise and competencies for
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- jurisdictional program manager positions (see **Section 2.3.2**).
- Prepare a fiscal reporting strategy based upon an audit of the fiscal analysis reporting section of the PEA, to better define the expenditure and budget line items included in the fiscal report (see **Section 2.3.4**).
  - Prepare metric definitions and guidance to improve efficacy of the assessment process.
  - Standardize SDR and SAR definitions of “High” priority and develop prioritization process that is better predicated on the threat (diminished by BMP implementation) posed by the facility, and consider the presence of “constituents of concern” (see **Section 5.3.1**).
  - Redefine IPM (pesticide use) indicators (see **Section 5.3.1**).
  - Prepare guidance documentation and clarify requirements or conceptual Project WQMP (see **Section 7.3.1**).
  - Prepare guidance and training as needed on the recordation process (timing and appropriate documents to use) and develop recommendations for appropriate methods to employ to enable the Permittees to enforce the approved WQMP against subsequent property owners (see **Section 7.3.1**).
  - Develop library of BMP performance reports (see **Section 7.3.1**).
  - Develop standard design checklist/plans/details for source and treatment control BMPs (see **Section 7.3.1**).
  - Develop recommendations/guidance for enhanced Model WQMP language regarding Site Design BMPs (see **Section 7.3.1**).
  - 
  - Evaluate the NTS approval process and develop recommendations for streamlining regulatory agency approval of regional treatment control BMPs (see **Section 7.3.1**).
  - Prepare a training schedule including defined expertise and competencies for staff with WQMP review and approval responsibilities (see **Section 7.3.1**).
  - Prepare a training schedule including defined expertise and competencies for construction inspectors (see **Section 8.3.1**).
  - Develop a more detailed prioritization process to improve standardized reporting and to support re-direction of inspection resources to significant sources of priority constituents of concern (see **Section 9.3.1**).
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- Develop effective alternative to re-inspection such as self-certification (see **Section 9.3.1**).
- Prepare defined expertise and competencies for authorized inspector positions and develop a training schedule to meet these requirements (see **Section 9.3.1**).

### DAMP Modifications:

- Revised the DAMP for greater consistency with established Environmental Management System (EMS) principles and improved accessibility to different constituencies and levels or readership (see **Section 2.3.3**).
- Revised **DAMP Section 3.0 plan improvement process** to detail iterative process for DAMP improvement (see **Section 3.3.1**).
- Defined “fixed facilities,” “field programs,” and “drainage facility sites” (see **Section 5.3.1**).
- Eliminated Environmental Performance Reporting (EPR) program (which is duplicative of Model Municipal Activities Program) (see **Section 5.3.1**).
- Revised Model WQMP Table 7.II.6 for latest information on BMPs and clarity (see **Section 7.3.1**).
- Evaluated and revised (as necessary) prioritization provisions for Countywide consistency (see **Section 7.3.1**).
- Provided definitive construction site prioritization guidance (see **Section 8.3.1**).
- Clarified inspection frequencies; violation definitions and re-inspection (see **Section 9.3.1**).
- Provided definitive industrial and commercial facility descriptions (see **Section 9.3.1**).

### **13.4 Establishing Watershed-Based Water Quality Planning**

#### ROWD Commitment:

- Complete DAMP/Watershed Action Plans for all 11 Orange County watersheds (see **Section 12.3.2**).
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