

# San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report



A Collaborative Effort of:

City of Chula Vista  
City of Coronado  
City of Imperial Beach  
City of La Mesa  
City of Lemon Grove  
City of National City  
City of San Diego  
County of San Diego  
Port of San Diego  
San Diego County Regional Airport Authority

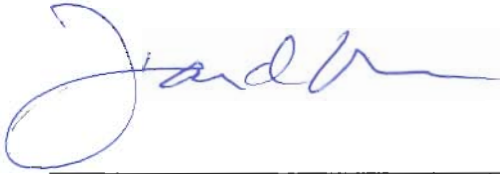
January 29, 2009



**STATEMENT OF CERTIFICATION**

San Diego Bay Watershed Urban Runoff Management Program Document

I certify under penalty of law that the San Diego Bay Watershed Urban Runoff Management Program Annual Report for 2007-2008 was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



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DAVID MERK  
Director  
Environmental Services Department  
San Diego Unified Port District



***San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report  
Statement of Certification***

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Signed certification statements for the participating San Diego Bay Copermittees are located in Appendix A of this report.

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## **Acknowledgements**

The development and production of this Watershed Urban Runoff Management Program Document for the San Diego Bay Watershed Management Area (San Diego Bay WMA) are the result of the talents and experience of numerous individuals. Their contributions and insight made this document a collective success for the environment and for the watersheds. The primary authors of the text include:

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The San Diego Bay Copermittees also wish to recognize the public for their continued expressed concern for the protection and conservation of the San Diego Bay WMAs environmental resources.

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## **ACRONYMS AND ABBREVIATIONS**

303(d)	Section of the Clean Water Act
BIA	Building Industry Association
BLTEA	Baseline Long-Term Effectiveness Assessment
BMP	Best Management Practices
BOD	Biologic Oxygen Demand
BWE	Baseline Watershed Evaluation
CBSM	Community Based Social Marketing
COC	Constituent of Concern
Copermittees	The 18 cities within San Diego County, the County of San Diego, the Port of San Diego, and the San Diego County Regional Airport Authority
CSDM	Coastal Storm Drain Monitoring
CWA	Clean Water Act
DWM	Dry Weather Monitoring
DEH	County of San Diego Department of Environmental Health
EIS	Environmental Impact Assessment
EPA	Environmental Protection Agency
FOG	Fats, Oils, and Grease Program
FY	Fiscal Year
HHW	Household Hazardous Waste
HA	Hydrologic Area
HOA	Homeowners Association
HU	Hydrologic Unit
IBI	Index of Biological Integrity
IC/ID	Illicit Connection / Illicit Discharge
ILACSD	I Love A Clean San Diego
IPM	Integrated Pest Management
IRTA	Institute for Research and Technical Assistance
JURMP	Jurisdictional Urban Runoff Management Program
LID	Low Impact Development
MBAS	Methylene Blue Active Substances
MLS	Mass Loading Station
MS4	Municipal Separate Storm Sewer System
MUSLE	Modified Universal Soil Loss Equation
Municipal Permit or Permit	San Diego Regional Water Quality Control Board Order 2007-0001
NGO	Non-Governmental Organization
NNE	Numeric Nutrient Endpoint
NOEC	No Observed Effect Concentration
NPDES	National Pollution Discharge Elimination System
OAL	Office of Administrative Law
ORCA	Online Research Coastal Academy
ORWMP	Otay River Watershed Management Plan
PCW	Project Clean Water

**San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report  
Acronyms and Abbreviations**

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PDP	Pollutant Discharge Potential
PSA	Public Service Announcement
PWQP	Priority Water Quality Problems
RHMP	Regional Harbor Monitoring Program
RUMP	Regional Urban Runoff Management Plan
RWQCB	Regional Water Quality Control Board
SAG	Stakeholder Advisory Group
SAMP	Special Area Management Plan
San Diego Bay Copermittees	The County of San Diego, the Port of San Diego, and the Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, National City, San Diego, and Airport Authority
SDB	San Diego Bay
SDCRAA	San Diego County Regional Airport Authority (Airport Authority)
SDRWQCB	San Diego Regional Water Quality Control Board
SHELL	Shellfish Beneficial Use
SIYB	Shelter Island Yacht Basin
SSMP	Sewer System Management Plan
SUSMP	Standard Urban Stormwater Management Plan
SWAMP	Surface Water Ambient Monitoring Program
SWELL	Stewardship Watershed Education for Lifelong Leadership
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
TWAS	Temporary Watershed Assessment Station
UCCE	University of California Cooperative Extension
URMP	Urban Runoff Management Program
WARM	Warm Fresh Water Habitat
WILD	Wildlife Habitat
WMA	Watershed Management Area
WQA	Water Quality Activity
WQO	Water Quality Objective
WQTR	Water Quality Technical Report
WURMP	Watershed Urban Runoff Management Program

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## **Executive Summary**

Since January 2002, the County of San Diego, Port of San Diego, the San Diego County Regional Airport Authority (Airport Authority), and the cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego (San Diego Bay Copermittees) have been active in developing and implementing watershed-based programs in the San Diego Bay watershed management area (WMA). This Annual Report represents the San Diego Bay Copermittees' efforts during Fiscal Year (FY) 2007-2008 to meet the requirements of Section E of the Municipal Storm Water Permit Order Number 2007-0001 (Municipal Permit or Permit) and develop and implement the San Diego Bay Watershed Urban Runoff Management Program (WURMP).

The San Diego Bay Copermittees successfully completed the watershed-based requirements of the Municipal Permit and provided many opportunities for public participation and stakeholder input. Due to the success of the programs implemented during FY 2007-2008, the San Diego Bay WURMP achieved the following objectives: 1) continued implementation of activities to specifically address the sources of water quality problems at a watershed and hydrologic area (HA) level; 2) continuation of the comprehensive water quality program, including long-term trend analysis where appropriate; 3) an evaluation of the collaborative effort on a watershed and HA level; 4) continued refinement of the watershed program; and 5) continue progress toward meeting WURMP goals and objectives. The San Diego Bay Copermittees have worked to identify, implement, and assess watershed water quality, education, and public participation activities, as well as land use planning watershed-based mechanisms targeting high priority water quality problems and their sources.

During this reporting period, the San Diego Bay Copermittees continued improvements on the water quality assessment for the San Diego Bay WMA. Three major sub-watersheds, or hydrologic units (HU), comprise the WMA: the Pueblo San Diego (908 HU), Sweetwater (909 HU), and Otay (910 HU). The watersheds vary greatly in size, land use, and population, and have different water quality issues as a result. During the 2007-2008 monitoring year, total suspended solids (TSS), turbidity, total and fecal coliforms, *enterococci*, dissolved copper, and total dissolved solids (TDS) were identified as high frequency of occurrence constituents of concern (COCs) in the Pueblo San Diego HU. These results are similar to past reporting periods with the exception of a reduction of the frequency of occurrence for dissolved lead and zinc and an increase in the frequency of occurrence for TSS and TDS. The results of monitoring regarding pesticides remained similar to past reporting periods, as Diazinon and Malathion concentrations were detected below the acute benchmarks. During the 2007-2008 monitoring year, monitoring data was limited to dry weather monitoring (DWM), Coastal Storm Drain Monitoring (CSDM), and the Department of Environmental Health (DEH) AB411 programs in the Sweetwater or Otay HUs. There have not been any significant changes to the COCs identified for the Sweetwater HU, though fecal coliform remains a high frequency of occurrence COC. There have not been any significant changes to the COCs identified for the Otay HU.

Future monitoring, including a temporary watershed assessment station (TWAS) location, will be conducted within this watershed during the 2009-2010 monitoring year and will provide the Copermittees with a more robust dataset to analyze trends and water quality problems.

The San Diego Bay Copermittees continue to improve watershed efforts in the San Diego Bay WMA, using innovative methods and new tools as they become available. The overarching goal for the San Diego Bay WURMP is to cooperatively and through collaborative strategic planning decrease the potential sources and reduce the discharge of pollutants from the Municipal Separate Storm Sewer System (MS4) that have been identified as causing high priority water quality problems. The Copermittees relied heavily on the Watershed Strategy to guide the selection of activities. Each Copermittee individually selected activities that were feasible to institute in their jurisdiction, and selected activities for implementation that are appropriate for their relative contribution to the watershed's high priority water quality problem. The San Diego Bay Copermittees have implemented a number of water quality and education activities during this reporting year. There were 15 Load Reduction/Source Abatement activities, five Targeted Special Studies, four Total Maximum Daily Load (TMDL) related activities, and eight Monitoring/Source Identification activities implemented. Of the short and long-term educational activities occurring within the San Diego Bay WMA, there were 14 education activities, trainings, and events in which assessments showed Copermittees efforts are positively impacting the public and leading to changes in knowledge about storm water quality issues. Additional information on all watershed activities is provided in Section 3 of this Annual Report.

The 2007-2008 program assessment conducted by the San Diego Bay Copermittees continued to utilize the Framework Document and demonstrated program effectiveness at many levels. The Copermittees assessed effectiveness by: 1) evaluation of individual activities, 2) a comprehensive assessment at a HA level, and 3) a comprehensive assessment at the watershed level. An integrated assessment of activity effectiveness within each HA was conducted to determine the collective impact of the activities on the targeted high priority pollutants and/or pollutant sources. This evaluation has revealed where Copermittee efforts were successful in addressing the high priority water quality problems and whether the activities were or were not effectively targeting identified pollutant sources in each HA. The Copermittees' assessments of the individual activities indicate nearly all of the water quality activities were able to achieve the stated goals and were effective in obtaining Outcome Levels Three and Four.

Comprehensive assessment at the HA level revealed that Pueblo San Diego HU had the largest number of activities among the three watersheds. Copermittees were successful in implementing activities addressing nearly all of the high priority pollutants in the HAs, as all but Gross Pollutants (908.1 HA) were addressed by one or more water quality activity. In particular, the Copermittees were not only successful in implementing activities that collectively addressed all of the high priority pollutant water quality problems in 908.2 HA, but were also effective in targeting a variety of pollutant sources. During this reporting year, the Copermittees have implemented numerous activities in this heavily urbanized HA such as the Chollas Creek Water Quality Protection and Habitat Enhancement Project and the Enhanced Street Sweeping

Activity, which have been effective in addressing the high priority water quality problems and reducing pollutant loads based on quantities of trash and debris removed. A number of the activities implemented in this HA resulted in Level Four Outcomes for bacteria, metals, sediment, and trash. In addition, the Dry Weather Aerial Deposition Study provided important source information for metals and sediment. Data resulting from this monitoring will enable the Copermittees to make more informed decisions on the best management practice (BMP) implementation that targets these high priority pollutants in the future. The Sweetwater and Otay HUs had fewer high priority water quality problems relative to Pueblo San Diego HU. As such, there were fewer water quality activities implemented in these watersheds. However, the activities that were implemented addressed bacteria in these HAs in which it was identified as a high priority water quality problem. Copermittees identified and targeted a common source of bacteria by implementing the Pet Waste Bags Program in these HUs. In addition, additional activities targeted other likely sources of bacteria in 909.1 and 910.2 HAs. Collectively, these activities were considered to be effective in reducing the loading of bacteria into the MS4. Though no water quality activities addressing pesticides were implemented in the Sweetwater HU during this reporting period, educational efforts did occur which provided Integrated Pest Management (IPM) program information to residents and businesses within the HUs.

The Copermittees have achieved the Outcome Levels One through Four during this reporting period. Educational activities such as Earth Day at Imperial Beach Pier and the Integrated Pest Management for Landscape Professionals training courses, as well as the water quality activities such as Pet Waste Bags and Enhanced Inspections demonstrated changes in knowledge and behavior (Levels Two and Three). The San Diego Bay Copermittees also achieved load reductions (Level Four) through various programs that either targeted the pollutants of concern or the pollutant sources. Notably, **416.8** tons of trash and debris were collected throughout the WMA during cleanup events this reporting year. Assessment of trash and debris related activities such as Pet Waste Bags, Storm Drain Litter Control Techniques, Enhanced Street Sweeping, and Cleanup Events resulted in a cross-programmatic watershed analysis of the effectiveness of these programs to address particular high priority pollutants originating from a variety of sources. These are fully detailed in Section 4 of this Annual Report. Activities such as public participation at cleanup events, the general public's use of household hazardous waste (HHW) collection facilities and pet waste bags scaled multiple levels of assessment resulting in increases in awareness, behavior changes, and load reductions. The Copermittees assessed the effectiveness of the BMP implementation plans for the three adopted TMDLs in the San Diego WMA. Based on the monitoring results from the Chollas Creek Diazinon TMDL, the San Diego Bay Copermittees' efforts to address Diazinon through education and outreach programs are adequate for meeting the goals of the TMDL. The implementation plans for the Chollas Creek Dissolved Metals TMDL and the Shelter Island Yacht Basin are still under development; therefore, the Copermittees were unable to assess the effectiveness of these BMP implementation plans.

Utilizing the effectiveness assessment and monitoring data, Copermittees will continue to identify future collaborative watershed activities to address high priority water quality problems

on a watershed and HA level. To this end, Copermittees will strive to gather additional water quality data suitable for assessments, as well as research the sources of pollutants of concern and their loading potential. A more thorough identification of sources and their loading potential will enable the San Diego Bay Copermittees to modify WURMP program activities and devote resources to specifically target the most troublesome sources using the most efficient BMPs.

## **Section 1: Introduction**

The NPDES Municipal Storm Water Permit, Order No. R9-2007-0001, referred to throughout this document as the “Permit” or “Municipal Permit”, requires the Copermittees sharing the San Diego Bay Watershed Management Area (WMA) to collaborate on the development and implementation of a Watershed Urban Runoff Management Program (WURMP). This Annual Report will be covering two permit periods, the previous San Diego Region Order No. 2001-01 and the current San Diego Region Order No. R9-2007-0001. The updated San Diego Bay WURMP began implementation on March 24, 2008. The WURMP is a collaborative effort to address high priority surface water quality issues throughout the San Diego Bay WMA. The program includes identifying and addressing high priority water quality problems in the WMA, and developing and implementing activities that include pollutant load reduction and abatement (Watershed Water Quality Activities), Watershed Education Activities, as well as public participation and collaborative land use planning.

This Annual Report is divided into five sections that highlight the efforts of the San Diego Bay Watershed Copermittees, referred to throughout this document as San Diego Bay Copermittees, during the FY 07-08 reporting period. The reporting period is from July 1, 2007, through June 30, 2008.

- Section 1: Provides an overview of the information included in this report, and summarizes the ongoing collaboration among San Diego Bay Copermittees.
- Section 2: Provides an update of water quality throughout the WMA, identifies high priority water quality problems in each hydrologic area (HA), and provides information about potential pollutant sources causing these problems.
- Section 3: Describes the Watershed Water Quality and Watershed Education Activities that occurred during this reporting period as well as any public participation or collaborative land use planning that took place.
- Section 4: Discusses WURMP effectiveness as a whole. The main goals of this section are to: 1) assess collaboration among San Diego Bay Copermittees; 2) determine whether watershed activities are focused on appropriate water quality problems; 3) assess whether targeted outcomes are being achieved; and 4) evaluate the collective impact of all WURMP activities on pollutant loads, urban runoff discharge quality, and receiving water quality at the HA scale. Section 4 also includes specific information regarding an assessment of Chollas Creek TMDL implementation.
- Section 5: Provides a discussion of conclusions reached during FY 07-08 as well as recommendations for future reporting periods.

## **1.1 Copermittee Collaboration**

WURMP development and implementation is a collaborative effort by all of the following San Diego Bay Copermittees:

- City of Chula Vista
- City of Coronado
- City of Imperial Beach
- City of La Mesa
- City of Lemon Grove
- City of National City
- City of San Diego
- County of San Diego
- Port of San Diego
- San Diego County Regional Airport Authority (Airport Authority)

The Port of San Diego is the lead Copermittee and continues to serve as both coordinator of collaborative efforts among San Diego Bay Copermittees and liaison between Copermittees and Regional Water Quality Control Board (RWQCB) staff.

The San Diego Bay Copermittees met 12 times during this reporting period. Appendix B provides a summary of the dates and general topics of discussion. The majority of the meetings focused on developing the updated San Diego Bay WURMP submitted to the RWQCB on March 24, 2008.

During this reporting period, the San Diego Bay Copermittees collaborated extensively on the development of a watershed strategy that guides WURMP activity selection. An extensive explanation of the San Diego Bay Watershed Strategy was presented in the San Diego Bay WURMP document. The *Water Quality Control Plan for the San Diego Basin* (SDRWQCB, 1994) prepared by the RWQCB defines the San Diego Bay WMA as being comprised of three watersheds (or hydrologic units (HU)). They are the Pueblo San Diego Watershed, the Sweetwater Watershed, and the Otay Watershed, and are further divided into HAs. The San Diego Bay Copermittees developed a database of baseline information consisting of land use, water quality monitoring data, and other information on potential pollutant sources, and identified the high priority water quality problems on a HA level.

The San Diego Bay Copermittees used the information from the Watershed Strategy to identify four common water quality activities which have been coordinated and standardized at the HA level. These activities were identified as beneficial to address high priority water quality problems and can be applied within different locations at different scales of implementation as

determined by each Copermittee within their respective HAs. These activities include Pet Waste Bag Programs, Storm Drain Litter Control Techniques, Street Sweeping Enhancements, and Cleanup Events. This approach allowed for greater flexibility for each of the Copermittees to participate in coordinated watershed activities. Each of these activities would collect similar data to show how these programs were being effective at the both the HA and WMA level. In addition to the collaborative activities mentioned above, each Copermittee initiated or completed individual activities that target high priority water quality problems within the HAs their jurisdictions fall in, such as targeted facility inspections and pilot BMP projects. Furthermore, collaboration on the watershed strategy enabled the San Diego Bay Copermittees to identify data gaps by reviewing existing monitoring and land use data. Such data provided the basis for developing additional water quality monitoring and source identification activities such as the coordinated dry weather monitoring program being implemented by the City of San Diego, the Port of San Diego, and the Airport Authority. Section 3 provides specific detail on each program that was initiated or completed during the FY 07-08 reporting period.

## **1.2 San Diego Bay Watershed Map Updates**

There will be no San Diego Bay Watershed map updates included in the FY 07-08 Annual Report. An enlarged San Diego Bay land use map is located in Appendix C.

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## **Section 2: Water Quality and Pollutant Source Assessment**

The San Diego Bay Copermittees are working to ensure implementation of water quality assessment strategies that will result in meaningful data and allow determination of long-term water quality changes in the San Diego Bay WMA. This section of the report describes information collected by the San Diego Bay Copermittees to meet the requirements stated in Section J.3.b.2.c. of the Permit.

The San Diego Regional Copermittees tasked a consultant with compiling and analyzing water quality data from the San Diego region. In addition to analyzing data on a regional basis, the consultant also assimilated information and analyzed data for each of the nine WMAs within San Diego County. The results of these tasks are described in the *2007-2008 San Diego County Municipal Copermittees Urban Runoff Monitoring Report* prepared for the San Diego County Municipal Copermittees. The report is structured to answer the following five Core Management Questions presented in Section I.B of the Receiving Waters and Urban Runoff Monitoring and Reporting Program:

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

To achieve this end, the report provides analyses from various monitoring programs and the results are applied to the Core Management Questions. The San Diego Bay WMA is described in Section 10 of the *2007-2008 Urban Runoff Monitoring Report*. Please refer to the *2007-2008 San Diego County Municipal Copermittees Urban Runoff Monitoring Report* for more specific information regarding analytical assessments. Please note that most of the text from the report included here is reported verbatim.

### **2.1 Water Quality Assessment Approach**

The watershed water quality assessment methodology used by the San Diego Bay Copermittees includes separate evaluations for receiving waters and urban runoff discharges. This organization follows the general format of the Permit, making the results of the assessment more meaningful by providing a closer linkage to the Core Management Questions as well as avoiding mixing datasets from programs undertaken for different reasons. Knowledge of baseline conditions through the various monitoring programs occurring within the watershed will

allow the San Diego Bay Copermittees to evaluate current conditions and long-term trends in receiving water quality conditions.

### 2.1.1 Water Quality Monitoring Programs and Data

Monitoring data is one of the most useful pieces of information for assessing the pollutants within a watershed. Data collected under the Receiving Waters and Urban Runoff Monitoring and Reporting Program of the Permit can indicate elevated pollutant levels, toxicity problems, or ecological impacts that may be influencing urban runoff contributions to the receiving water quality issues. The San Diego Bay Copermittees have utilized data from several monitoring programs as part of the 2007-2008 San Diego Bay WMA assessment, which are outlined in Table 2-1.

Table 2-1. San Diego Bay WMA Assessment Data.

<b>Program</b>	<b>Type of Assessment</b>	<b>Constituents Measured</b>
Mass Loading Stations (MLS) Ambient and Storm Monitoring	Receiving Water and Urban Runoff	Toxicity, Chemistry, Trash
Post-storm Sediment Pyrethroid Monitoring	Receiving Water	Grain size, pesticides, TOC
Rapid Stream Bioassessments	Receiving Water	Benthos
Dry Weather Monitoring (DWM)	Urban Runoff	Chemistry, Metals, Bacteria
Coastal Storm Drain Monitoring (CSDM)	Receiving/Urban Runoff	Bacteria
Regional Harbor Monitoring Program (RHMP)	Receiving Water	Sediment Chemistry, Toxicity, Benthos
Department of Environmental Health (DEH) AB411 Program	Receiving Water	Bacteria
Metals TMDL	Urban Runoff	Metals
Diazinon TMDL	Urban Runoff	Pesticides
Additional Studies	Urban Runoff	Bacteria, Metals, Pesticides

The San Diego Bay WMA consists of three major watersheds that vary greatly in terms of size, population, and land use, and have different water quality issues as a result. Because the amount and type of data available in each watershed may not be the same, the San Diego Bay Copermittees have attempted to assess each watershed independently to provide a more accurate assessment of the San Diego Bay WMA as a whole.

Assessments were conducted using data from the various monitoring programs and the results were applied to the relevant core management questions using a weight-of-evidence approach. Wet weather monitoring was not conducted in the Sweetwater and Otay HUs during the 2007-

2008 monitoring season because this monitoring was not required by the rotational monitoring under Order R9-2007-0001. As a result, assessment is limited to historical receiving water monitoring data, jurisdictional DWM data, and CSDM data. Although MLS monitoring data has been collected and assessed within the Pueblo San Diego and Sweetwater HUs, the San Diego Bay Copermittees have not accrued this data for the Otay HU since the 2001-2002 monitoring season due to insufficient flow. A Temporary Watershed Assessment Station (TWAS) station within the lower Otay HU will be monitored during 2009-2010. This will provide useful information needed to address data gaps and to establish a comprehensive assessment of the Otay HU.

Water bodies in the San Diego Bay WMA and constituents that have been placed on the SWRCB 2006 Section 303(d) list are presented in Table 2-2. The table includes the water bodies that are listed in which a total maximum daily load (TMDL) has been either adopted or is in development.

**San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report**  
**Section 2 – Water Quality and Pollutant Source Assessment**

Table 2-2. San Diego Bay WMA SWRCB Section 303(d) Listed Water Bodies and TMDL Status.

Water Body Name	Pollutant/Stressor	TMDL Status
<b>Pueblo San Diego HU</b>		
San Diego Bay Shoreline, near Sub-Base	Benthic community effects and sediment toxicity	In development
San Diego Bay Shoreline, Shelter Island Shoreline Park	Indicator bacteria	In development
San Diego Bay Shoreline, at Harbor Island (West Basin)	Copper	Not developed
San Diego Bay Shoreline, G Street Pier	Indicator bacteria	In development
San Diego Bay Shoreline, near Switzer Creek	Chlordane, Lindane/Hexachlorocyclohexane, and PAHs	In development
San Diego Bay Shoreline, vicinity of B Street and Broadway Piers	Indicator bacteria, benthic community effects, and sediment toxicity	In development
San Diego Bay Shoreline, Downtown Anchorage	Benthic community effects and sediment toxicity	In development
San Diego Bay Shoreline, at Harbor Island (East Basin)	Copper	Not developed
San Diego Bay Shoreline, at Marriott Marina	Copper	Not developed
San Diego Bay Shoreline, at America's Cup Harbor	Copper	Not developed
Shelter Island Yacht Basin	Copper	TMDL adopted
Chollas Creek	Copper, lead, zinc, and diazinon	TMDLs adopted
Chollas Creek	Indicator bacteria	In development
San Diego Bay Shoreline, near Chollas Creek	Benthic community effects and sediment toxicity	In development
San Diego Bay Shoreline, 32 <sup>nd</sup> Street Naval Station	Benthic community effects and sediment toxicity	In development
San Diego Bay Shoreline, between Sampson Street and 28 <sup>th</sup> Street	Copper, mercury, PAHs, PCBs, and zinc	In development
San Diego Bay Shoreline, Near Coronado Bridge	Benthic community effects and sediment toxicity	Not developed
San Diego Bay Shoreline, Seventh Street Channel	Benthic community effects and sediment toxicity	In development
San Diego Bay Shoreline, north of 24 <sup>th</sup> Street Marine Terminal	Benthic community effects and sediment toxicity	Not developed
<b>Sweetwater HU</b>		
San Diego Bay Shoreline, at Bayside Park (J Street)	Indicator bacteria	In development
San Diego Bay Shoreline, at Chula Vista Marina	Copper	Not developed
Sweetwater Reservoir	Dissolved oxygen	Not developed
Loveland Reservoir	Aluminum, manganese, and dissolved oxygen	Not developed
<b>Otay HU</b>		
Pacific Ocean Shoreline, Imperial Beach Pier	PCBs	Not developed
San Diego Bay	PCBs	Not developed
San Diego Bay Shoreline, at Coronado Cays	Copper	Not developed
San Diego Bay Shoreline, at Glorietta Bay	Copper	Not developed
Pogi Canyon Creek	DDT	Not developed
Otay Reservoir, Lower	Color, iron, manganese, nitrogen ammonia (total ammonia), and pH (high)	Not developed

## **2.1.2 Receiving Water Body Water Quality Assessment**

One component of San Diego Bay WMA water quality assessment focuses on analyzing data collected from receiving water bodies under ambient conditions. This component evaluates current receiving water conditions and tracks long-term changes in receiving water quality. Analysis of the data is intended to answer the Core Management Questions listed below, which are numbered as listed in the Municipal Permit.

As stated in Section 2.1.1, to accomplish the goals of the new Permit, monitoring was scheduled to alternate between the north and south portions of San Diego County each year. Receiving water monitoring and bioassessment monitoring was conducted in the Pueblo San Diego HU during the 2007-2008 monitoring season, but were not conducted in the Sweetwater and Otay HUs. DWM, CSDM, and third-party monitoring, however, were conducted during the 2007-2008 monitoring season in the Sweetwater and Otay HUs. Due to a lack of historical data associated with monitoring in the Otay HU, the summaries presented below are limited to the Pueblo San Diego and Sweetwater HUs.

### **2.1.2.1 Core Management Question #1 – Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?**

#### **Pueblo San Diego HU**

The conditions in the Pueblo San Diego HU indicate that beneficial use impairments exist or have the potential to exist. Elevated concentrations of heavy metals, fecal indicator bacteria, TSS, and turbidity continue to be measured above their respective benchmarks. Dissolved copper, TSS, and dissolved zinc exceedances may act as impairments to biological beneficial uses, such as estuarine habitat, warm freshwater habitat, cold freshwater habitat, wildlife habitat, and marine habitat. Fecal indicator bacteria measured above their respective benchmarks during both ambient and wet weather conditions within the Pueblo San Diego HU indicate possible impairment of the REC-2 Beneficial Use. While Chollas Creek is not currently listed as a REC-1 water body, it is listed as having a potential REC-1 Beneficial Use.

CSDM data did not indicate that fecal indicator bacteria from coastal storm drains were impacting coastal receiving waters with any regularity. Monitoring completed by the County of San Diego Department of Environmental Health (DEH) at three beach sites within the Pueblo San Diego HU as part of the AB411 Monitoring Program indicated eight occurrences where indicator bacteria levels exceeded action levels. The causes of these exceedances are mainly unknown; however, three of the instances are likely to be attributed to urban runoff from a storm event and maintenance to a nearby water main line.

The stream bioassessment results indicate evidence of benthic community impairment with Very Poor Index of Biological Integrity (IBI) ratings at the Chollas Creek MLS. However, constituents not measured under this program or physical habitat disturbances may also act as stressors to the benthic community. Use of the numeric nutrient endpoint (NNE) assessment

tool indicated that secondary indicators of eutrophication were protective of beneficial uses. Current nutrient concentrations at the MLS do not appear to be inducing low dissolved oxygen or elevated biomass. Potential impairment of the WARM Beneficial Use was indicated by a measured pH level above 9.0 pH units.

Toxicity was not observed to *C. dubia* in exposures to storm water collected during the 2007-2008 monitoring season. However, toxicity to *H. azteca* was observed in greater than 50% of the samples, providing evidence of persistent toxicity. The increasing trend in *H. azteca* toxicity is likely attributed to the presence of synthetic pyrethroids, based on Toxic Identification Evaluations (TIE) performed on Chollas Creek storm water in 2006. Chemistry results from the 2007-2008 monitoring season indicate Bifenthrin concentrations were above the water quality benchmark during both storm events. Similarly, post-storm sediment analyses detected Bifenthrin above the sediment benchmark value of 3.0 ng/g. Cyfluthrin, Cypermethrin, and Permethrin were detected above reporting limits but were below sediment benchmarks.

### **Sweetwater HU**

Because wet weather monitoring was not conducted at southern San Diego County stations during the 2007-2008 monitoring season, historical water quality results from 2001-2007 were assessed. Based on the monitoring and data analyses conducted (limited to jurisdictional DWM, CSDM, and historical receiving water data), the conditions in the Sweetwater HU indicate that beneficial use impairments exist or have the potential to exist. Nitrate exceedances in urban runoff present potential threats to receiving water ecosystems, such as estuarine habitat, warm freshwater habitat, cold freshwater habitat, wildlife habitat, and marine habitat. Similarly, persistent TDS and turbidity benchmark exceedances represent potential impairments to these same biological beneficial uses. Fecal indicator bacteria are persistently above their respective benchmarks during wet weather conditions within the Sweetwater HU, indicating possible impairment of the REC-1 Beneficial Use during storm events. CSDM data did not indicate that fecal indicator bacteria from coastal storm drains was impacting coastal receiving waters with any regularity. In addition, the County of San Diego DEH AB411 Monitoring Program reported three exceedances of indicator bacteria during the 2007-2008 monitoring period.

The stream bioassessment results indicate evidence of benthic community impairment with IBI ratings of Very Poor at the Highway 94 Site and at the Bonita Road Site on Sweetwater River. Monitoring results have not shown evidence of persistent toxicity.

### **Otay HU**

Data associated with receiving water quality is limited within the Otay HU. CSDM data collected within the Otay HU did not indicate that fecal indicator bacteria from coastal storm drains was impacting coastal receiving waters with any regularity. The County of San Diego DEH AB411 Monitoring occurred at three locations within the Otay HU, resulting in seven indicator bacteria exceedances.

**Regional Harbor Monitoring Program Findings**

The Regional Harbor Monitoring Program (RHMP) was developed by the Port of San Diego, the City of San Diego, the City of Oceanside, and the County of Orange to address questions regarding the general water quality and condition of aquatic life in the four harbors within State Water Resources Control Board (SWRCB) Region 9 (San Diego). San Diego Bay was one of the four harbors sampled in this project. Key findings that help to answer Core Management Question 1 include:

- Copper concentrations in marinas were above water quality benchmarks, while concentrations of other metals and polyaromatic hydrocarbons were below water quality benchmarks.
- All bacterial concentrations were below AB 411 levels, which support REC-1 beneficial uses.
- The majority of physical water column measures occurred at levels suitable to support healthy biota.
- Sediment concentrations of copper in marinas and zinc in freshwater-influenced and marina strata occurred at levels likely to cause adverse biological effects.
- Polyaromatic hydrocarbons and all other sediment metals (except arsenic and mercury) primarily occurred at concentrations that were not likely to result in adverse biological effects.
- The majority of the freshwater-influenced and marina areas contained sediments that were not toxic.
- Benthic infaunal communities in both strata occurred at intermediate levels of disturbance.
- In the marina stratum, the primary surface water, sediment, and benthic infaunal community indicators occurred at levels that were worse than harbor-wide historical conditions.
- Toxicity levels in the marina sediments were generally better than harbor-wide historical conditions.
- In the freshwater-influenced stratum, primary surface water, sediment, and toxicity indicators were better than historical conditions; only benthic infauna indicators were worse.
- The marina stratum tended to have higher concentrations of surface water and sediment chemistry indicators when compared with the freshwater-influenced stratum.
- Toxicity levels and benthic infaunal communities did not differ between the two strata.
- From 2005-2007, no negative short-term trends were evident for any indicator of a degrading condition.

**2.1.2.2 Core Management Question #2 – What is the extent and magnitude of the current or potential receiving water problems?**

An assessment of the extent and magnitude of receiving water quality problems is important to understand which constituents represent a significant majority of receiving water problems as well as to understand those spatial and temporal characteristics which may be attributed to water quality problems. To answer the extent and magnitude of receiving water problems, sample results were compared using magnitude of exceedance ratios.

**Pueblo San Diego HU**

Magnitudes of exceedances in Chollas Creek during wet weather were higher during the first flush event than during the February event for the COCs, with the exception of the *H. azteca* No Observed Effect Concentration (NOEC) values. For one or more of the storm events, turbidity, fecal coliform, and *H. azteca* toxicity were greater than five times the benchmark, while TSS, dissolved copper, and dissolved zinc were two to four times the benchmark. Although concentrations of the banned pesticides Chlorpyrifos and diazinon were detected during both 2007-2008 monitored storm events, concentrations were below water quality benchmarks. However, synthetic pyrethroids were detected during every sample collected in Chollas Creek, including third-party samples collected from both forks in the upper watershed.

Recent studies suggest that as a consequence of its highly urbanized location, Chollas Creek may receive a significant portion of its total copper load from aerial deposition of roadway dust (copper is a main component of automotive brake wear), industrial emissions (WESTON, 2007), and air conditioner condensate (City of San Diego, 2008). Third-party data taken from a sampling location upstream of the Chollas Creek MLS indicated that upstream and downstream dissolved metals concentrations were fairly consistent within the north fork and south fork of Chollas Creek. Dissolved copper and dissolved zinc were slightly higher in the upper watershed than at the base of the watershed during some storm events, while for other storm events, the opposite was true.

Monitoring during ambient conditions at the Chollas Creek MLS occurred twice during the reporting period during March and June of 2008. While the results from the March monitoring event yielded several analytes above benchmark values, water quality during the June ambient weather event was markedly improved. Stream bioassessment data indicate a benthic community impairment rating of Very Poor at the MLS. The nearest reference site, Boulder Creek, had an IBI score rating of Fair.

**Sweetwater HU**

To answer the extent and magnitude of receiving water problems, historical sample results were compared using magnitude of exceedance ratios. In 2006-2007, constituents that were above water quality benchmarks consisted of TDS, turbidity, biologic oxygen demand (BOD), fecal coliform, and *C. dubia* reproduction NOECs. The *C. dubia* reproduction NOEC (15 times the

benchmark) and BOD (four times the benchmark) were highest during the first flush event, while turbidity (three times the benchmark) was highest during the February 2007 event. Fecal coliform concentrations were measured at approximately 20 times the benchmark during the October 2006 and February 2007 events. Stream bioassessment data from the 2006-2007 monitoring season rates the benthic community as Very Poor on the Sweetwater River at both Highway 94 and at Bonita Road. These ratings were consistent with previous ratings at these locations since 2001.

### **Regional Harbor Monitoring Program Findings**

Key RHMP findings that help to answer the extent and magnitude of water quality problems include:

- All bacterial concentrations were below AB 411 levels, which support REC-1 beneficial uses.
- Sediment concentrations of copper in marinas and zinc in freshwater-influenced and marina strata occurred at levels likely to cause adverse biological effects.
- The majority of the freshwater-influenced and marina strata contained sediments that were not toxic.
- Benthic infaunal communities in both strata occurred at intermediate levels of disturbance.
- The marina stratum tended to have higher concentrations of surface water and sediment chemistry indicators than the freshwater-influenced stratum.
- Toxicity levels and benthic infaunal communities did not differ between the two strata.

#### **2.1.2.3 Core Management Question #5 – Are conditions in receiving waters getting better or worse?**

##### **Pueblo San Diego HU**

In general terms, the conditions of the receiving water appear to have remained consistent with those of previous monitoring years. Significantly increasing trends were noted for turbidity, total copper, total zinc, and *H. azteca* toxicity. Decreasing trends were noted for nitrate and TDS. Although the yearly increase in turbidity is slight, turbidity values are above the benchmark. Both copper and zinc are associated with atmospheric deposition stemming from transportation and industrial land uses in this watershed. Increasing trends of copper and zinc may be associated with drier than normal conditions where resuspension of particulates and continued buildup prior to the wet season results in higher concentrations in storm water runoff.

*H. azteca* toxicity responses have been attributed to the use of synthetic pyrethroids within the watershed. The NOEC for *H. azteca* has been decreasing in recent years, representing increased toxicity to the benthic community. Toxicity to *C. dubia* from exposure to water

collected at the Chollas Creek MLS was not observed in 2007-2008, but has occasionally been observed in previous years associated with diazinon detections. With fewer exceedances of diazinon over time, it is evident that *C. dubia* survivorship has improved.

Bioassessment data results over the period of monitoring from 2001-2008 do not indicate any observed changes in benthic quality ratings. The MLS has had IBI ratings of Very Poor for the past three years and has been rated either Poor or Very Poor since 2001-2002.

### **Sweetwater HU**

Trend evaluation at the Sweetwater MLS was based on previous monitoring years. In general terms, the conditions of the receiving water showed only two constituents, pH and dissolved phosphorus, with increasing trends. Although there is an increasing trend for pH, it remains within the center of the pH range (6.5-8.5 pH units); dissolved phosphorus remains below the water quality benchmark value of 2.0 mg/L.

Bioassessment results over the period of monitoring from 2001-2007 at both Sweetwater River locations indicate that conditions within the benthic community have remained relatively static with regard to IBI ratings. IBI ratings of Very Poor have been recorded in both spring and fall surveys, with one exception at both Sweetwater River bioassessment locations since 2002. Similarly, observed to expected (O/E) taxa ratios have been representative of substantially impaired communities.

As previously mentioned, toxicity has been observed in samples collected from the Sweetwater River MLS. The exceedance rate for toxicity for *C. dubia* survival was 17% in both acute and chronic testing, while the exceedance rate for reproductive toxicity was 33%. Toxicity was observed in *S. capricornutum* in 39% of the bioassay tests performed since 2001. However, in the past two years, only two of 18 tests have shown toxicity; therefore, there is evidence that survivorship of bioassay tests conducted at the Sweetwater River MLS during storm water events is improving.

### **Regional Harbor Monitoring Program Findings**

The RHMP key findings that help to determine trends in receiving waters include:

- In the marina areas, the primary surface water, sediment, and benthic infaunal community indicators occurred at levels that were worse than harbor-wide historical conditions.
- Toxicity levels in the marina sediments were generally better than harbor-wide historical conditions.
- In the freshwater-influenced stratum, primary surface water, sediment, and toxicity indicators were better than historical conditions; only benthic infauna indicators were worse.

- From 2005-2007, no negative short-term trends were evident for any indicator of a degrading condition.

### **2.1.3 Urban Runoff Discharges Water Quality Assessment**

An evaluation of urban runoff discharge water quality from MS4s is the second component of the San Diego Bay WMA assessment. Urban runoff discharges are evaluated for dry weather discharges and wet weather discharges. Data collected for the urban runoff discharge component of the water quality assessment is separated into wet weather data and dry weather data because the mechanisms and extent of pollutant mobilization are somewhat different for the two types of conditions.

#### **2.1.3.1 Core Management Question #3 – What is the relative urban runoff contribution to the receiving water problem(s)?**

##### **Pueblo San Diego HU**

Core Management Question 3 is partially answered through the evaluation of DWM Program data and CSDM Program data, trash assessments, and pyrethroid monitoring assessments. Data from the jurisdictional DWM show that within the Pueblo San Diego HU, several constituents, including conductivity, fecal indicator bacteria, and turbidity frequently exceeded water quality benchmarks. Fecal coliform, *enterococci*, and turbidity were also identified as an either high or medium frequency of occurrence COC at the Chollas Creek MLS, suggesting urban runoff is contributing to the receiving water problems.

During the CSDM Program, no wet weather fecal indicator bacteria exceedances were detected at storm drains discharging to coastal receiving waters. One of two storm drain samples collected during dry weather conditions exceeded the dry weather action level for fecal coliform. However, receiving water samples remained below benchmarks. As a result, the coastal storm drains within the Pueblo San Diego HU do not appear to be adversely affecting receiving waters with respect to fecal indicator bacteria.

Trash and synthetic pyrethroids are solely anthropogenic in nature, and their route to receiving waters occurs through urban runoff, direct dumping, or via indirect sources (e.g., wind or animals such as birds, coyotes, and rodents). An increasing trend in *H. azteca* toxicity has been attributed to the presence of synthetic pyrethroids. Bifenthrin was above the water quality benchmark during both storm events and in post-storm sediment analyses. While it appears likely that pesticide use will continue within the watershed, the active ingredients comprising these compounds may change over time based on regulations, availability, price, and effectiveness. Trash surveys taken at the Chollas MLS rated the site Marginal 75% of the time and Optimal 25% of the time.

### **Sweetwater HU**

In the Sweetwater HU, only DWM data and CSDM data are available for the 2007 DWM monitoring season. Data from the DWM indicate that within the Sweetwater HU, several constituents, including conductivity, fecal indicator bacteria, nitrate, and turbidity frequently exceeded water quality benchmarks. Fecal coliform was also identified as a high frequency of occurrence COC within the Sweetwater receiving water, suggesting that urban runoff may be contributing to the receiving water problems.

During the CSDM Program, only one sample was collected from the storm drain and one sample was collected from the receiving water. The low number of samples was likely due to dry conditions at either the storm drain outfall or the receiving water. Although fecal coliform and total coliform concentrations were above dry weather action levels at the storm drain, no exceedances were measured at the receiving water. Due to the limited number of samples (one sample) collected in the CSDM Program, it is difficult to accurately assess whether coastal receiving waters are being impacted by fecal indicator bacteria contained in urban runoff.

### **Otay HU**

In the Otay HU, only jurisdictional DWM data and the CSDM Program data were available for the 2007 DWM monitoring season. Constituent results above dry weather action levels at the DWM Program sites included ammonia, conductivity, *enterococci*, total coliform, fecal coliform, orthophosphate, nitrate, and surfactants (MBAS). Nearly half of the dry weather monitoring stations sampled had bacterial concentrations that were above action levels. Exceedances were generally located in the northern portion of the Coronado HA and Lower Otay Valley HA.

Results of CSDM conducted within the Otay HU during the 2007 DWM season did not showcase exceedances of indicator bacteria. Due to the limited amount of monitoring data located within Otay HU, a direct association between urban runoff discharge and receiving water quality could not be made.

#### **2.1.3.2 Core Management Question #4 – What are the sources of urban runoff that contribute to receiving water problem(s)?**

### **Pueblo San Diego HU**

A variety of analyses can be used to determine the sources of urban runoff that contributes to receiving water quality problems including, but not limited to, storm water program monitoring and land use data. The DWM and CSDM Programs provide some measure of urban runoff sources. The lower watershed sites are located in areas downstream of residential and transportation land uses which have the highest potential for contributing pollutants to receiving waters. Trash assessments conducted at the Chollas Creek MLS site included three Marginal rankings and one Optimal ranking, which indicated that the most prevalent trash observed was household waste. The potential routes indicated for these assessments was determined to be

through dumping or littering, while other potential sources were unable to be determined. However, due to the limited dataset, this assessment is only limited to the area in close proximity of the MLS. Future trash information collected during the 2008 DWM Program should provide a more robust dataset to address Core Management Question 4. The DWM Program and the CSDM Program have measures to identify sources and eliminate illicit discharges (IC/ID). Future MS4 Outfall Monitoring and Source Identification Monitoring will also provide additional data useful in answering Core Management Question 4.

Additionally, the City of San Diego conducted an aerial deposition study to determine if fallout from aerial deposition represents a significant pathway for metals pollutant loading in various waterways within Pueblo San Diego HU. Results indicate the following:

- Sites along Chollas Creek have the highest loading deposition rates.
- Santa Ana winds and local wildfires may cause significant higher deposition rates within areas of the City of San Diego as a result of ash fallout and higher resuspension rates.
- Wet weather deposition rates are low but may be a contributing factor in wet weather exceedances of dissolved copper and zinc in Chollas Creek based on the low compliance levels set by the California Toxics Rule. Additionally, wet weather deposition of copper and zinc may be more influential for Chollas Creek than studies from other regions have indicated.
- Indirect aerial deposition particulates account for the majority of copper, zinc, and to a lesser degree, lead that is found in storm water runoff. Copper and lead were found to have relatively low solubility in their freshly deposited state—11% and 2.5%, respectively, were the highest solubility rates measured—while zinc solubility was considerably higher (88% of the total zinc concentration).

### **Sweetwater and Otay HUs**

Due to the limited amount of data collected in the Sweetwater and Otay HUs during 2007-2008, an accurate assessment of the sources of urban runoff discharges has not been conducted. The Sweetwater MLS and the future TWAS within the Otay HU are located in areas downstream of primarily residential and transportation land uses, which have the highest potential for contributing pollutants to receiving waters. Future assessments likely to provide more insight into sources of urban runoff include trash assessments, the MS4 Outfall Monitoring Program, and the Source Identification Program.

#### **2.1.4 Prioritization of Water Quality Issues**

The San Diego Bay Copermittees presented a Baseline Watershed Evaluation (BWE) assessment in the San Diego Bay WURMP document. The BWE process utilized Baseline Long-Term Evaluation Assessment (BLTEA) ratings, monitoring data, and source information to determine water quality problems throughout the San Diego Bay WMA. The evaluation was conducted at the HA scale so that management actions could be better focused to address

water quality problems. Section 3 of the San Diego Bay WURMP document provides a summary of the baseline conditions.

The results of the BWE are intended to serve as guidance throughout the course of the Permit. In addition, the results of the BWE serve as a metric to which annual monitoring assessments of current conditions can be compared. Annual assessments intend to portray changes in the frequency of occurrence and trends for constituents as well as overall water quality. Using annual assessments of water quality allows the San Diego Bay Copermittees to track improvements associated with watershed activities or determine increasing trends of pollutants which require specific management actions.

Table 2-3 portrays the BLTEA ratings which are updated on a five-year cycle and are used to guide long-term programmatic watershed activities. The table also provides a comparison of 2006-2007 and 2007-2008 high frequency of occurrence ratings. The results are compared to evaluate whether or not water quality improvements occur on an annual basis. The following text provides a summary of the annual assessment compared to the baseline metric reported in the San Diego Bay WURMP document.

**San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report**  
**Section 2 – Water Quality and Pollutant Source Assessment**

Table 2-3. BLTEA Ratings for the San Diego Bay WMA.

Watersheds/Subwatersheds	Percentage of Total Area	Priority Ratings*										
		Constituent Groups										Stressor Groups
		Heavy Metals	Dissolved Minerals	Organics	Oil and Grease	Sediments	Pesticides	Nutrients	Gross Pollutants	Bacteria/Pathogens	Benthic Alterations	Toxicity
<b>San Diego Bay WMA</b>	<b>100%</b>	<i>D</i>	<i>B</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>C</i>	<i>D</i>	<i>D</i>	<i>B</i>	<i>C</i>	<i>B</i>
Point Loma HA (908.10)	2%	<i>A</i>	<i>D</i>	<i>D</i>	<i>B</i>	<i>C</i>	<i>B</i>	<i>D</i>	<i>D</i>	<i>A</i>	<i>A</i>	<i>A</i>
San Diego Mesa HA (908.20)	9%	<i>A</i>	<i>D</i>	<i>A</i>	<i>D</i>	<i>A</i>	<i>A</i>	<i>C</i>	<i>B</i>	<i>A</i>	<i>A</i>	<i>A</i>
National City HA (908.30)	2%	<i>C</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>B</i>	<i>C</i>	<i>A</i>	<i>A</i>	<i>A</i>
Lower Sweetwater HA (909.10)	11%	<i>D</i>	<i>A</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>B</i>	<i>D</i>	<i>D</i>	<i>A</i>	<i>A</i>	<i>B</i>
Middle Sweetwater HA (909.20)	19%	<i>D</i>	<i>B</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>A</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>B</i>	<i>B</i>
Upper Sweetwater HA (909.30)	22%	<i>D</i>	<i>B</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>C</i>	<i>D</i>	<i>C</i>	<i>C</i>	<i>B</i>	<i>B</i>
Coronado HA (910.10)	2%	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>D</i>	<i>D</i>	<i>B</i>	<i>A</i>	<i>D</i>	<i>D</i>
Otay Valley HA (910.20)	10%	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>D</i>	<i>C</i>	<i>C</i>	<i>A</i>	<i>D</i>	<i>D</i>
Dulzura HA (910.30)	22%	<i>D</i>	<i>B</i>	<i>D</i>	<i>D</i>	<i>C</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>D</i>	<i>C</i>
2006-2008 Diamond Ratings												
<b>2006-2007 monitoring season</b> High <sup>1</sup> Frequency of Occurrence Ratings and COCs	Wet weather	◆◆◆ Copper Lead Zinc				◆◆◆ Tur- bidity				◆◆◆ Total coliform Fecal coliform <i>Entero- cocci</i>	Very Poor IBI	
<b>2007-2008 monitoring season</b> <b>Pueblo San Diego HU</b> High <sup>1</sup> Frequency of Occurrence Ratings and COCs	Wet weather					◆◆◆ TSS Tur- bidity				◆◆◆ Total coliform Fecal coliform <i>Entero- cocci</i>	Very Poor IBI	Yes
	Ambient	◆◆◆ Copper	◆◆◆ TDS									
<b>2007-2008 monitoring season</b> <b>Sweetwater HU</b> High <sup>1</sup> Frequency of Occurrence Ratings and COCs	Wet weather									◆◆◆ Fecal coliform	Very Poor IBI <sup>2</sup>	
	Ambient											

1. High frequency of occurrence ratings are derived from the constituent exceedances tables and are provided for comparison purposes.

2. This rating based on 2006-2007 monitoring information. No new data was collected during FY 07-08.

Notes:

\* = Rating Calculated Based on Area Weighted Averages of Score Value from the subwatershed areas.

\*\* = Priority Level (Highest-A to Lowest-D)

High Priority Level Based on Data

2006 SWRCB Section 303d listing

### **Pueblo San Diego**

During the 2007-2008 monitoring year, both wet weather and ambient conditions were evaluated within the Pueblo San Diego HU. TSS, turbidity, total and fecal coliforms, *enterococci*, dissolved copper, and TDS were identified as high frequency of occurrence COCs. As presented in Table 2-2, these results are similar to past reporting periods with the exception of a reduction of the frequency of occurrence for dissolved lead and zinc and an increase in the frequency of occurrence for TSS and TDS. Dissolved lead did not exceed benchmark values during two wet weather monitoring events. Dissolved zinc was rated as a low frequency of occurrence during wet weather monitoring.

The results of monitoring regarding pesticides remained similar to past reporting periods. Diazinon and Malathion concentrations were detected below the acute benchmarks. The shift in use patterns from diazinon to readily available synthetic pyrethroids is evident. The synthetic pyrethroid Bifenthrin was above the benchmark during both storm events monitored, while three other pyrethroids were detected during the first flush storm event.

A review of the statistical trends for constituents in the Pueblo San Diego HU shows significantly increasing trends for turbidity, total copper, and *H. azteca* acute toxicity. The significantly increasing trend for *H. azteca* toxicity is likely associated with the increased use of synthetic pyrethroids. Significantly decreasing trends are evident for TDS and nitrates.

Bioassessment monitoring was conducted at one monitoring site in the Pueblo San Diego HU, located in Chollas Creek at Federal Blvd. The Chollas Creek Site had IBI ratings of Very Poor during both spring and fall surveys. The O/E ratios of the site also indicated that the site had degraded macroinvertebrate communities.

### **Sweetwater HU**

During the 2007-2008 monitoring year, receiving water monitoring and bioassessment monitoring were not conducted in the Sweetwater HU. Monitoring data was limited to DWM, CSDM, and DEH AB411 monitoring data. Due to the lack of monitoring data during this period, there have not been any significant changes to the COCs identified for the Sweetwater HU. Fecal coliform remains a high frequency of occurrence COC for the Sweetwater HU. Future monitoring at the Sweetwater River MLS station will occur during 2008-2009 and 2009-2010.

### **Otay HU**

Receiving water monitoring and bioassessment monitoring have not been conducted in the Otay HU since the 2001-2002 monitoring season. Monitoring data for 2007-2008 was limited to DWM, CSDM, and DEH AB411 monitoring data. Results from the DWM program indicate that nearly half of the samples collected had exceedances of bacteria. The overall DWM exceedance percentage is similar to that observed within the Pueblo San Diego Watershed. Future monitoring including a TWAS location will be conducted within this watershed during the

2009-2010 monitoring year and will provide the San Diego Bay Copermittees with a more robust dataset to analyze trends and water quality problems. Due to the lack of monitoring data during this period, there have not been any significant changes to the COCs identified for the Otay HU. As a result, the high priority water quality problems remain as reported in the San Diego Bay WURMP document.

## **2.2 Pollutant Source Assessment**

The Permit requires the San Diego Bay Copermittees to identify the high priority water quality problems and identify the likely sources within the San Diego Bay WMA, then implement activities that will address these pollutants. A key component of identifying pollutants is knowledge of the land uses for each HA and the pollutant-generating activities generally associated with these specific land uses.

In an effort to increase the effectiveness of the likely sources information presented in Tables 3-4 and 3-5 within Section 3.3 of the San Diego Bay WURMP document, the San Diego Bay Copermittees have streamlined the information and presented the source information at the HA level in Table D-1 and D-2 in Appendix D of this Annual Report. Table D-1 identifies the high priority pollutants within each HA, land use percentages, pollutant-generating activities, and the Watershed Strategy recommendation for improving water quality in these HAs. The categories consist of commercial, residential, streets and roadways, parks, and construction site activities. Table D-2 details the pollutants generated by business sources within each HA.

Although common business activities tend to produce similar pollutants, land uses vary in each HA and impact water quality differently, which requires strategic planning and coordination of watershed water quality activities and watershed education. This understanding of land use activity and associated pollutants, coupled with the BLTEA ratings allows the San Diego Bay Copermittees to identify appropriate programs to address the high priority water quality problems within the San Diego Bay WMA.

The San Diego Bay Watershed Strategy to improve water quality includes a combination of joint and individual jurisdictional efforts to monitor, identify, investigate, educate, implement appropriate BMPs, and enforce where necessary. The information presented in this section will assist in developing appropriate assessment techniques and programs to improve impaired water quality.

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## **Section 3: Implementation of Watershed Activities**

### **3.1 Watershed Water Quality Activities**

This Annual Report follows the standardized format developed by the San Diego Regional Copermittees to provide the necessary information required by sections E, H, I.2 and 4, and J.3.b of the Permit. Watershed Activity Implementation Summary Sheets for all watershed activities implemented during this reporting period, including activities implemented in compliance with a TMDL, are located in Appendices E and G of this Annual Report. The format of the activity summary template utilized by the San Diego Bay Copermittees is presented in the San Diego Bay WURMP document.

The San Diego Bay Copermittees relied on the Watershed Strategy to guide the selection of watershed water quality activities. Each Copermittee has individually decided which activities are feasible to institute in their jurisdiction, and has selected watershed water quality activities for implementation that are appropriate for their relative contribution to the watershed's high priority water quality problems.

Table 3-1 presents the water quality activities implemented in FY 07-08. During this reporting period, the San Diego Bay Copermittees implemented 15 Load Reduction and Source Abatement Activities, six Targeted Special Studies, four TMDL related Activities, and eight Monitoring and Source Identification Activities. Progress has been described for each watershed activity and the Copermittees have identified what was accomplished during the reporting period and how it pertains to high priority water quality problems in particular HAs.

As part of the collective effort, the Copermittees identified four common jurisdictional water quality activities and began the process of coordinating and standardizing these activities at the watershed level during this reporting period. This collaborative approach was utilized because these activities were identified as being beneficial to address the high priority water quality problems, and can be applied within different locations and at different scales of implementation as determined appropriate by each Copermittee within their respective HA. The collaborative activities included Pet Waste Bags, Storm Drain Litter Control Techniques, Enhanced Street Sweeping and Cleanup Events. The benefit of this approach is that it allows an assessment of the activity at both the jurisdictional level as well as at a HA or watershed level.

**San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report  
Section 3 – Implementation of Watershed Activities**

Table 3-1. San Diego Bay WURMP Water Quality Activities in FY 07-08.

San Diego Bay Watershed	Hydrologic Area									High Priority Pollutant Categories									
	908.1	908.2	908.3	909.1	909.2	909.3	910.1	910.2	910.3	Bacteria	Dissolved Minerals	Gross Pollutants	Metals	Nutrients	Oil & Grease	Organics	Pesticides	Sediment	Trash
	<b>LOAD REDUCTION AND SOURCE ABATEMENT ACTIVITIES</b>																		
<b>Trash and Debris Related Activities</b>																			
Pet Waste Bag Collaborative Watershed Activities (1)	X	X	X	X			X	X	X					•					
Storm Drain Litter Control Techniques Collaborative Watershed Activity (2)		X	X	X														•	•
Enhanced Street Sweeping Collaborative Watershed Activities (3)	X	X	X	X			X						•					•	•
Collaborative Cleanup Events (4)			X	X			X	X											•
Clean Community Program (5)			X	X															•
Trash Containment Boom Cleaning Agreement with US Navy (6)		X	X																•
<b>Enhanced Inspection Activities</b>																			
Additional Dry Season Construction Inspections (7)			X	X															•
San Diego Bay Watershed Targeted Facility Inspections (8)	X	X	X	X				X					•						
Enhanced Construction Oversight (9)		X																	•
La Mesa Business Inspection Supplemental Watershed Questionnaire (10)			X	X									•						
<b>Targeted Special Studies</b>																			
Chollas Creek Water Quality Protection & Habitat Enhancement Project (11)		X											•	•	•	•	•	•	•
Municipal Rain Barrel Installation and Downspout Disconnects (12)	X	X	X	X				X						•	•	•	•	•	•
Dalbergia "Green Mall" Infiltration Retrofit (13)		X																	
Southcrest Park Green Lot Infiltration Project (14)		X																	
Memorial Park "Green Lot" Infiltration Retrofit Activity (15)		X																	
<b>TMDL Activities</b>																			
Shelter Island Yacht Basin Dissolved Copper TMDL (16)	X												•						
Chollas - Switzer - Paleta Creek Mouths TMDL (17)	X	X											•						
Chollas Creek Diazinon TMDL (18)	X	X																	•
Chollas Creek Dissolved Metals TMDL (19)		X											•						

**San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report  
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San Diego Bay Watershed	Hydrologic Area								High Priority Pollutant Categories											
	908.1	908.2	908.3	909.1	909.2	909.3	910.1	910.2	910.3	Bacteria	Dissolved Minerals	Gross Pollutants	Metals	Nutrients	Oil & Grease	Organics	Pesticides	Sediment	Trash	
<b>ADDITIONAL MONITORING AND SOURCE IDENTIFICATION ACTIVITIES</b>																				
Enhanced Dry Weather Monitoring Program (20)		X																		
Coordinated Dry Weather Monitoring Programs (21)	X																			
La Mesa Water Quality Monitoring Program (22)		X																		
BMP Effectiveness Monitoring Program (23)		X																		
Dry Weather Aerial Deposition Study (24)		X																		
Regional Harbor Monitoring Program (25)	X		X	X																
Chollas Creek Design Storm Study and Sediment and Bacteria Relationship Source Study (26)		X																		
Chollas Creek Beneficial Use Designation Attainability Study and Mouth of Chollas Creek Bacteria Source ID Study (27)																				

\* Numbers in parenthesis ( ) indicate the order in which the watershed water quality activity summary sheets are presented in this Annual Report.

Currently, there are four TMDLs that have either been adopted or are in the final stages of development, as indicated by Table 2-2. Activity summary sheets have been prepared in order to provide updated information on the efforts by the San Diego Bay Copermittees during this reporting period to meet the requirements set forth in Section J.3.b.I. of the Permit. Further assessment of TMDL BMP implementation efforts is presented in Section 4.2 of this Annual Report.

The Watershed Strategy indicates that where there are data gaps that must be filled before successful implementation of a load reduction activity can occur, monitoring and/or source identification activities are necessary. Eight monitoring and source identification activities were implemented during this reporting period. While the San Diego Bay Copermittees recognize that these types of activities are not considered for credit toward Permit compliance, the importance of the monitoring information to the overall success of the Watershed Strategy and the Copermittees' ability to address high priority water quality problems cannot be overlooked. Monitoring information will support future management decisions regarding the planning, implementation, and assessment of watershed activities.

### **3.2 Watershed Education Activities**

The San Diego Bay Copermittees have recognized the need for education programs as an essential element in watershed protection. The main focus of the watershed education program is to make the public aware of the sources of water pollution in order to positively affect behavioral change. Section 3.2.1 details the Watershed Education Activities that the Copermittees have implemented this reporting year.

#### **3.2.1 San Diego Bay Education Program**

The San Diego Bay Education Program is outlined in the San Diego Bay WURMP document. The program's focus is to educate the public about the San Diego Bay WMA and the high priority water quality problems within the watershed. The San Diego Bay Copermittees have implemented several short and long-term educational tasks that address watershed concepts and watershed pollutants. These tasks also overlap several programs within Municipal Permit compliance on a jurisdictional, watershed, or regional level.

Table 3-2 provides a summary of the education tasks that the San Diego Bay Copermittees implemented this reporting year. Each of the tasks is further described in Sections 3.2.2.1 – 3.2.2.6. Rather than listing the number of individuals estimated to have been reached by each subcategory activity, the table lists the number of events as a more representative summation of the education and outreach efforts. Additionally, the overlapping nature of these educational activities across jurisdictional, watershed, and regional boundaries is presented. The table also provides an indication of the jurisdiction(s) that participated or provided the opportunities for certain types of educational activities, as well as the relationship of these educational activities to watershed concepts and/or surface water pollutants, especially those pollutants found to be pollutants of concern in the San Diego Bay WMA. Information on specific education events can

be found in Appendix F of this report. Additionally, activity implementation summary sheets for educational activities listed for implementation in FY 07-08 in the San Diego Bay WURMP document are located in Appendix G. Please note that in an effort to include only San Diego Bay WURMP watershed education activities, events that did not specifically discuss the San Diego Bay WMA and/or watershed pollutants of concern were excluded from both Table 3-2 and Appendix F.

### **3.2.1.1 Public Presentations and Media for Watersheds**

The Public Presentations and Media Watershed Elements of the San Diego Bay Education Program were designed to incorporate general watershed, receiving water, and storm water pollution prevention concepts and principles into existing and planned public presentation and media opportunities at the jurisdictional level. The San Diego Bay Copermittees have used a variety of means to meet this objective and will continue to evaluate and improve their effectiveness. For purposes of this Annual Report, the Public Presentation and Media element of the Education Action Plan has been subcategorized under six sub-headings as shown in Table 3-2 and described below. Further detail on these activities is provided in Appendix F.

Jurisdiction Storm Water Specific Events – These efforts were typically jurisdictional staff presentations to civic and business groups that specifically discuss watershed issues, storm water pollutants, BMPs, and storm water regulatory requirements. The San Diego Bay Copermittees held 21 events over eight different jurisdictions. Examples of these types of events implemented in FY 07-08 include: The Negocio Verde Pollution Prevention (P2) Workshop for Marinas and Boaters; the Standard Urban Storm water Mitigation Plan (SUSMP) workshop for the development, planning, and construction community; and the Building Industry Association Seminar-Preparation of a Storm Water Pollution Prevention Program (SWPPP) and Sampling Program using the Building Industry Association (BIA) Template for construction site owners and developers.

Jurisdiction-Hosted Events – The San Diego Bay Copermittees have made efforts to present storm water and watershed education information at various functions hosted by other departments within their respective jurisdictions. Examples of this type of activity include: the municipal Fire Station Open House in Coronado at which storm water BMP information was disseminated, Construction BMP Training for City storm water staff at a BIA workshop, and training on the SUSMP Updates for the new Municipal Permit in which Engineering and Land Development Staff learned about the updated SUSMP, Water Quality Technical Reports (WQTR), pollutants of concern, BMP selection, maintenance, Construction Permit, and phased grading.

Community-Hosted Events – The San Diego Bay Copermittees have presented watershed and storm water education at various events hosted by community and private groups within their jurisdiction, such as hosting an information booth at local walking/running race events or trade association conferences.

Festival Participation – Similar to the opportunities to share education materials at events hosted by local community groups or the jurisdictions themselves, community festivals, such as the San Diego County Fair, provide another venue for public outreach and education. The San Diego Bay Copermittees were involved in 17 different events this reporting period, including the Fourth Annual Kids for Clean Water Menehune Surf Fest and the Inaugural Earth Day at the Imperial Beach Pier event.

Print Media – Several of the San Diego Bay Copermittees have made efforts to attract media attention. The Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, National City, and San Diego, as well as the Port of San Diego and the Airport Authority have been successful at gaining print media coverage for their watershed and storm water management efforts and the results of their programs. Articles in the Coronado Eagle and Journal, the Imperial Beach Eagle and Times, and the EDCO Environmental Times were printed during this reporting period. In addition, Copermittees have presented watershed concepts through pamphlets, brochures, and displays or kiosks in public areas. Notably, the Think Blue program messages were advertised on transit shelters and billboards, and on mobile ads on static billboard trucks roaming within the Chollas Creek. Additional information on these activities is located in Appendix G. The San Diego Bay Copermittees continue to explore opportunities at making coordinated efforts to garner print media coverage as an outreach and education mechanism.

Public Service Announcements (PSAs) – The County of San Diego aired three different PSAs this reporting year, which focused on water conservation, gardening, and manure composting. There were a total of 221 airings in the County of San Diego. Additionally, the Think Blue media campaign continues to be a mechanism for conducting watershed and storm water pollution prevention education and outreach throughout the San Diego Bay WMA and the entire region. The 2007-2008 reporting period represents the seventh straight year that Think Blue has been in operation. Think Blue provides outreach to the general public through public service announcements in both English and Spanish. Refer to Appendix G for the activity summary sheet on the *Karma*, *Karma Second Chance*, and *Karma Tourist* PSAs produced and broadcasted by the City of San Diego. In addition to running Think Blue PSA videos on television screens at the Terminal 2 Baggage Claim area, the Airport Authority also displayed “Don’t Trash California” anti-littering PSA posters throughout the airport terminals.

**San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report  
Section 3 – Implementation of Watershed Activities**

Table 3-2. Summary of Education Activities.

Tasks from the WURMP Education Action Plan	Target Audience	Program Elements	Number of Events	Jurisdictional, Watershed, or Regional Program	Participating Jurisdictions	Concepts/Constituents of Concern Addressed					
						Watershed concepts	General Surface Water concepts	Copper/Zinc	Pesticides	Bacteria	Sediment
Public Presentations and Media - Watershed Element	General Public, Residential/Commercial/Industrial, Construction, Municipal	Jurisdiction Storm water-specific Events	21	J, W	Chula Vista, Coronado, County, Imperial Beach, National City, Port of San Diego, San Diego, Airport Authority	x	x	x	x	x	x
		Jurisdiction-Hosted Events	13	J, W	Chula Vista, Coronado, Lemon Grove, Airport Authority	x	x	x	x	x	x
		Community-Hosted Events	15	J, W	Coronado, County, La Mesa, Port of San Diego, San Diego	x	x	x	x	x	x
		Festival Participation	17	J, W, R	All	x	x	x	x	x	x
School Programs	K - 12 children	Print/Electronic Media	51	J, W	Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, Port of San Diego, San Diego, Airport Authority	x	x	x	x	x	x
		Public Service Announcements	8	W, R	All	x	x				
		Jurisdiction Staff Presentations	5	J, W	Chula Vista, Airport Authority, Port of San Diego	x	x				

**San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report**  
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Tasks from the WURMP Education Action Plan	Target Audience	Program Elements	Number of Events	Jurisdictional, Watershed, or Regional Program	Participating Jurisdictions	Concepts/Constituents of Concern Addressed					
						Watershed concepts	General Surface Water concepts	Copper/Zinc	Pesticides	Bacteria	Sediment
		Jurisdiction-Sponsored Presentations	26	J, W	County, Imperial Beach, La Mesa, National City, Port of San Diego, Airport Authority	x	x	x	x	x	x
		Field Trips	14	J, W	Chula Vista, Coronado, County, Imperial Beach, Port of San Diego	x	x		x		
		Project SWELL	2**	W, R	Port of San Diego, Airport Authority, City of San Diego	x	x				
Integrated Pest Management	General Public, Residential, Commercial/Industrial, Municipal	Jurisdictional IPM Seminars/Events	5	J, W, R	Coronado, Port of San Diego, San Diego	x	x		x		
		San Diego Regional IPM Program	4	W, R	All	x	x		x		
Project Clean Water Watersheds Website	General Public	Website with information related to surface water quality issues, watersheds, and pollutants	6,283	W, R	All	x	x	x	x	x	x
Partners in Clean Water	General Public	Cleanup Events	8	J, W	Chula Vista, Coronado, La Mesa, National City, Port of San Diego, San Diego, Airport Authority	x	x	x	x	x	x
		Citizen Monitoring/ Training	10	J, W	All	x	x	x	x	x	x

### **3.2.1.2 School Programs: San Diego Bay WMA**

School children are a primary focus of the San Diego Bay Education Program. The San Diego Bay Copermittees continue to focus on efforts to effectively promote watershed awareness and to initiate positive behavioral changes in children. The San Diego Bay Watershed Education Program (represented in Table 3-2) shows the four main sub-categories used to describe the education and outreach efforts directed at school children during this reporting period.

Jurisdiction Staff Presentations – Staff from the jurisdictions in the San Diego Bay WMA made a number of presentations at schools throughout the watershed. During these presentations which addressed students at all levels from elementary school to college, staff emphasized watershed issues, recycling, and the general storm water pollutants of concern. The events were estimated to reach over 4,000 students.

Jurisdiction-sponsored Presentations – In addition to conducting presentations or outreach for school children themselves, the San Diego Bay Copermittees also sponsored and/or participated in several additional outreach events. The total attendance at these events was more than 6,000 students.

Field Trips – The San Diego Bay Copermittees provided field trips to the Chula Vista Nature Center, the Maritime Museum, and local wetlands as an effective hands-on means of increasing watershed and water quality awareness in their students. Attendance at these field trips was more than 17,000 students.

Project SWELL – Project SWELL is a collaborative effort between San Diego City Schools, the City of San Diego, the Port of San Diego, Airport Authority, other municipalities, and non-profit organizations to establish comprehensive water quality and pollution prevention curricula in City schools. Started in May 2003, Project SWELL seeks to educate local school children about our region's watersheds while also fostering a sense of stewardship in these future leaders that will provide long-term solutions to the region's water quality problems. During 2007-2008, Project SWELL reached 10,000 5th graders, 10,000 6th graders, 10,500 4th graders, and 9,000 2nd graders. In all, Project SWELL reached more than 40,000 school children during the reporting period.

### **3.2.1.3 Integrated Pest Management (IPM)**

The San Diego Bay Copermittees believe that public education about IPM is an effective way to protect receiving waters from the impacts of diazinon and other pesticides. IPM promotes the use of integrated, ecologically sound pest management programs. Two main categories are used to describe education efforts related to IPM.

Jurisdictional IPM Seminars and Events – Efforts to educate the public to use IPM as a way to protect the beneficial uses of receiving waters throughout the watershed. This includes

Copermittee efforts to organize or participate in local seminars or events regarding IPM for local residents, businesses, and public agency staff.

San Diego Regional IPM Program – On behalf of the San Diego Regional Copermittees, grant money was used to implement an educational program aimed primarily towards the residential sector to induce positive changes in residents' attitudes and behaviors concerning pesticide use around their homes. During this reporting year and into the next, the San Diego Regional Copermittees participated in a booth and co-sponsored the San Diego County Fair. At the fair, the Copermittees distributed IPM pest tips cards as the main education focus along with other storm water information and giveaways.

#### **3.2.1.4 Project Clean Water Watershed Website**

As in previous years, the Project Clean Water (PCW) website ([www.projectcleanwater.org](http://www.projectcleanwater.org)) provided a venue for public education and outreach about the San Diego Bay WMA. In addition, the San Diego Bay Copermittees continue to link their individual jurisdictional websites to PCW. Each of these websites presents another mechanism for educating the public about watershed issues. These websites also function as public participation mechanisms. Please refer to the Public Participation section of this Annual Report (Section 3.3) for more information on this aspect of the PCW website for the San Diego Bay WMA.

#### **3.2.1.5 Partners in Clean Water**

The San Diego Bay Copermittees continue to nurture new and existing partnerships with individuals and groups within our communities that share our concern for the environment and our watershed. Table 3-2 shows the three main sub-categories used to describe the education and outreach efforts directed at these types of community partnerships during this reporting period.

Cleanup Events – In addition to the obvious public participation aspects of a cleanup event, these events provided an opportunity to conduct education and outreach about watershed issues and general storm water pollutants of concern. All the San Diego Bay Copermittees collectively sponsored the Creek to Bay Cleanup for the fourth year in a row. San Diego Bay Copermittees worked together to help fund and staff cleanup sites within the San Diego Bay WMA. Several of the San Diego Bay Copermittees also participated in Coastal Cleanup Day, as well as a number of smaller, jurisdiction-specific cleanup events. Additional information on the watershed cleanup events is located in Activity Summary Four in Appendix E.

Citizen Monitoring/Training – Citizen Monitoring Training and Citizen Monitoring events also provide opportunities for public participation, as well as education and outreach about watershed issues and general storm water pollutants of concern. The City of Coronado conducted Citizen Monitoring events during this reporting period.

### **3.2.1.6 Watershed Education for Municipal Staff**

The San Diego Bay Copermittees continue to provide storm water education to municipal staff, especially to those staff dealing directly with pollutants of concern in the watershed. Watershed training for municipal staff can be focused on more general concepts or on specific pollutants, depending on the audience. Incorporating watershed education into the required municipal staff training of the Jurisdictional Urban Runoff Management Plan (JURMP) helps the Copermittees address the high priority water quality problems in San Diego Bay. For more information on municipal staff training, please refer to each of the San Diego Bay Copermittee's individual JURMP.

### **3.3 Public Participation Activities**

Public participation during the development and implementation of the San Diego Bay WURMP has been, and continues to be, encouraged to ensure that stakeholder interests and creative solutions are considered. Broad participation is critical to further development and implementation of the watershed program. While participating jurisdictions aim to improve coordination among their own agencies, the watershed approach calls upon these agencies to engage diverse stakeholders in this process. Further, the participating municipalities recognize that no single agency has the capacity to address water quality issues on its own and that broad partnerships are essential to positively affect the water resources in the watershed. It is only through a collaborative approach that we will develop a better understanding of these issues and processes affecting water quality in our watersheds.

Effective public participation is driven by ensuring that the stakeholders are engaged at the appropriate level of decision-making. Public input into any decision-making process can be as simple as providing public notification that an initiative will occur, or a complex process that requires them to be intrinsically involved and responsible for the final decision-based outcome, or any level in between. The proper identification of the role of the public is crucial to ensuring the success of any initiative for which public input is sought. Table 3-3 provides a description of the possible levels of public participation, ranging from simple notifications to empowerment of full decision-making.

Table 3-3. Levels of Public Participation.

<b>Public Participation Objectives</b>				
<b>INFORM</b>	<b>CONSULT</b>	<b>INVOLVE</b>	<b>COLLABORATE</b>	<b>EMPOWER</b>
To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities, and/or solutions.	To obtain public feedback on analysis, alternatives, and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.

An opportunity for assessing public participation is available through the identification of the appropriate level at which to involve stakeholders in decision-making. Prior to embarking on a public participation opportunity, San Diego Bay Copermittees establish an objective defining the level at which the public is invited to be involved. The effectiveness of public participation in decisions affecting the San Diego Bay WMA can be assessed through an update on the status of that objective in Annual Reports by understanding the numbers of stakeholders reached through each decision-making opportunity (where applicable), and summaries describing how stakeholders participated in each opportunity.

The following section summarizes the activities and efforts made by the San Diego Bay Copermittees to encourage public participation during this reporting period. A complete list of public participation activities conducted within the watershed is included in Appendix H. Please note that this section only discusses the activities that were identified in the Public Participation section of the WURMP and relate to the San Diego Bay WMA. The San Diego Bay Copermittees have also conducted a number of regional programs and events involving the public in general water quality issues. Many municipalities have worked with stakeholders on efforts such as grant applications and water quality data collection.

### **3.3.1 Storm Water Copermittee Collaboration and Community Workshops**

Stakeholder participation is vital to the success of watershed activities. The San Diego Bay Copermittees provided several forums during FY 07-08 that allowed various stakeholder groups to participate in WURMP activities. Community workshops and activities that enhanced collaboration among San Diego Bay Copermittees are discussed below.

#### **San Diego Bay WURMP Meetings**

San Diego Bay WURMP meetings were held regularly to enhance communication among San Diego Bay Copermittees and other interested stakeholders. These meetings provided a venue for public participation by allowing Copermittees and other stakeholders to interact and discuss

local watershed efforts. Appendix B presents a summary of the meetings held by the workgroup during FY 07-08, including an outline of the principal agenda items.

### **Workshops and Conferences**

Several San Diego Bay Copermittees conducted educational workshops addressing storm water issues. These workshops targeted representative from businesses, the construction industry, and the general public. The topics ranged from simple BMP implementation to SWPPP preparation, and many were tailored to specific audiences. During the workshops, those in attendance were given opportunities to ask questions about the recommended BMPs and about more general storm water issues. The San Diego Bay Copermittees also targeted specific groups by setting up booths at various conferences and city festivals. Educational materials were distributed and personnel at the booths answered questions. More information about these booths is provided below under “Community Events.”

### **Presentations**

The San Diego Bay Copermittees conducted a variety of presentations during the reporting period, targeting many different types of audiences. These educational presentations provided educational media as well as a venue for questions about storm water issues to be discussed. Individuals who have a greater awareness and understanding of storm water issues will likely also be more active in taking measures to protect storm water quality and influencing others around them to do the same.

### **Community Events**

During this reporting period, the San Diego Bay Copermittees participated in a number of community events. Many of these events addressed regional water quality issues that spanned several watersheds. The San Diego Bay Copermittees feel such broad based activities play an important role in engaging the public on important water quality issues and that such public participation does positively impact water quality both in the San Diego region as a whole and in San Diego Bay.

### **Cleanup Events and Waste Collection**

Cleanup events give the public a chance to actively participate in improving the water bodies in their neighborhoods. In addition to the obvious benefits to water quality, such events also give residents a tangible understanding of the link between their actions and receiving water impacts. Active, hands-on experience tends to foster a sense of ownership and deepen participants' sense of responsibility for their local water bodies.

The San Diego Bay Copermittees have listed trash as a constituent of concern for the Pueblo Watershed. The Copermittees continue to implement a variety of activities to address this issue where applicable and, as a proactive measure, throughout the entire San Diego Bay WMA.

Cleanup events are an effective means of not only involving the community in protecting water quality, but also specifically removing trash from water bodies in urban settings. During cleanup events, participants are typically provided with educational material regarding watershed concepts and have the opportunity to discuss storm water issues with city staff and knowledgeable volunteers.

Free collection of household hazardous waste (HHW), electronic, and universal waste has occurred during FY 07-08. Often residents illegally dump these materials due to a combination of economic pressures, inconvenience, and/or lack of knowledge regarding where to go to dispose of the items. Waste collection events provide an avenue for the public to properly dispose of used oil, appliances, and other items for which they might otherwise have had to pay fees or transport for long distances.

Table 3-4 below details the number of workshops, conferences, presentations, and community events that were held and the number of people reached through these events. Note that an exact numeric attendance was not possible for all events. For a more detailed description of the events that occurred in each one of these categories, refer to Table H-1 in Appendix H.

Table 3-4. Summary of Activities.

<b>Type of Activity</b>	<b>Number of Events</b>	<b>Number of People Reached*</b>
Workshops/Conferences	8	264
Presentations	6	255
Community Events	12	41,976
Cleanup Events	26	6,878
Waste Collection Events	weekly	2,255

\* These totals do not include the numbers for some events for which attendance was not recorded.

### **3.3.2 Websites**

The Project Clean Water (PCW) website provides a means of public participation on San Diego Bay water quality issues. Each of the three sub-watersheds which drain to San Diego Bay—Otay, Pueblo, and Sweetwater—have pages devoted to them that are available for both the San Diego Bay Copermittees and public viewing. The San Diego Bay WURMP page includes downloadable WURMP and WURMP Annual Report documents, as well as land use and MS4 maps. The page specifically states that the San Diego Bay Copermittees are seeking public comment on the program and provides mail, email, and telephone contact information for the Lead Copermittee.

During the reporting period, 6,283 hits were recorded for the four main PCW web pages related to San Diego Bay WMA, which is comparable to the number of hits during the last reporting

period. The Pueblo Watershed received 1,309 hits, Sweetwater Watershed received 1,765 hits, and the Otay Watershed link received 1,685 hits.

In addition to the PCW website, several other websites with San Diego Bay WMA content have been developed. The City of San Diego worked with San Diego State University and San Diego Coastkeeper to continue to provide the San Diego Bay Watershed's Common Ground website (<http://www.sdbay.sdsu.edu>), which has interactive water quality maps, access to a variety of water quality data collected within the watershed, a watershed tour feature, and a variety of other watershed specific educational content. The Port of San Diego continues to display the Project ORCA (Online Research Coastal Academy) site, which provides interactive, San Diego Bay focused, environmental education targeted at children. Other San Diego Bay Copermittees' storm water websites, including the City of Coronado's, also provide information about San Diego Bay.

### **3.3.3 Integration And Participation in Local Planning Activities**

During the reporting period, San Diego Bay Copermittees and other stakeholders in the San Diego Bay WMA continued to participate in the development of plans intended to improve the water quality in San Diego Bay, including:

- Otay River Watershed Management Plan (ORWMP)
- Otay River Special Area Management Plan (SAMP)

Stakeholders in the areas in which these plans focus have attended regular meetings and providing valuable input on plan direction. Additional information on these planning activities will be discussed in Section 3.4 of this Annual Report.

Links to pages discussing the ORWMP and the Otay River SAMP are included on the Project Clean Water website. The sites include a variety of plan-related documents for public review and announcements of public meetings.

### **3.3.4 Direct Interaction**

In addition to the specific activities and programs described above, the San Diego Bay Copermittees' staff also interacts with the public on a daily basis. Municipal employees receive storm water training on an ongoing basis, as described in each JURMP. Staff with program implementation responsibilities receives the most intensive training, but other employees are educated about storm water issues as well. Municipal employees interact with the public in their jurisdictions through a variety of avenues, such as the discretionary permit review process, building permit process, building inspections, public presentations, and outreach campaigns. These activities allow municipal staff to receive public comments about storm water issues and regulations, as well as answer questions and provide guidance. This day-to-day personal interaction is an important component of the San Diego Bay Copermittees public participation activities.

### **3.4 Collaborative Land-Use Planning Efforts**

In recent years water quality management efforts have become increasingly watershed-focused, and the San Diego Bay Copermittees are working to integrate watershed management concepts into programs that can be implemented across jurisdictional boundaries. In general, this effort includes participation in watershed management plans, utilizing regional guidance documents, and increasing public participation. Long-term planning ensures the protection of beneficial uses, preservation of open space lands, and ensures a balance of land uses when planning future development. Several planning activities have been initiated.

During the reporting period, San Diego Bay Copermittees and other stakeholders in the San Diego Bay WMA continued to develop land-use plans intended to improve the water quality in San Diego Bay, including the following:

- Otay River Watershed Management Plan (ORWMP)
- Otay River Special Area Management Plan (SAMP)

The ORWMP has been approved by the Port of San Diego, the County of San Diego, and City of Imperial Beach. The Plan was approved by the City of San Diego in FY 08-09 and is still under consideration for approval by the City of Chula Vista. Therefore, there are no new action items to report for this reporting period. An interim Watershed Council will be established once the ORWMP has been approved.

In regards to the SAMP, the County of San Diego (through their consultant team) is preparing some of the technical information that is necessary to complete the 404(b)(1) process of the Clean Water Act. In addition, the Army Corps has received some funding to spend more time on this project. They are currently working through their contract process to hire a consultant to prepare the Environmental Impact Statement (EIS). It is hoped that the EIS will be underway by mid-summer 2009.

### **3.5 Updated Five-Year San Diego Bay WURMP Strategic Plan**

#### **3.5.1 New Activities**

The San Diego Bay Copermittees added six new water quality activities to the San Diego Bay WURMP Strategic Plan during FY 07-08. Five of the water quality activities were implemented during this reporting period. The Trash Containment Boom Cleaning Agreement with the U.S. Navy was a load reducing activity targeting trash and associated pollutants of concern. The La Mesa Business Inspection Supplemental Watershed Questionnaire was implemented to address commercial sources of pollutants of concern. Three new monitoring activities were also added to the Strategic Plan. They were: 1) Dry Weather Aerial Deposition Study, 2) the Chollas Creek Design Storm Study and Sediment and Bacteria Relationship Source Study, and 3) the Chollas Creek Beneficial Use Designation Attainability Study and Mouth of Chollas Creek Bacteria Source ID Study. The activity summary sheets for these activities are presented in

Appendix E. The 43<sup>rd</sup> and Logan Biofiltration Project (37) is a new activity in the Strategic Plan which is expected to be implemented in FY 09-10 and is included in Appendix I. An activity summary sheet (38) recapitulating how the City of San Diego is implementing its *Strategic Plan for Watershed Activity Implementation* (November 2007) is also included in Appendix I. Note that, although this City of San Diego document is separate from the San Diego Bay WURMP Strategic Plan, activities identified in the former are integrated into the latter as sufficient progress on activity implementation is made.

### **3.5.2 Updated 5-Year San Diego Bay WURMP Strategic Plan**

On an annual basis, the San Diego Bay WURMP's Strategic Plan will be assessed and may be updated to reflect the current status of watershed activities and any modifications to previous versions of the Strategic Plan. During this reporting period, the San Diego Bay Copermittees have been committed to implementing the watershed water quality and education activities presented in Sections 3.1 through 3.4 of this Annual Report. In addition, the Copermittees are progressing towards making a more efficient and effective watershed program through modifications to the San Diego Bay WURMP and through their involvement in the dialogue between the San Diego Regional Copermittees and the RWQCB regarding WURMP permit language.

#### **3.5.2.1 Updates to San Diego Bay WURMP Strategic Plan**

In the San Diego Bay WURMP document, the San Diego Bay Copermittees presented watershed activities to be implemented in FY 07-08 or FY 08-09 of the Municipal Permit. A number of the watershed activities scheduled for implementation in FY 08-09 require an updated activity summary sheet as changes to these activities have occurred since the Copermittees submitted the San Diego Bay WURMP document. Appendix I presents the activities for which updating is necessary and are summarized in Table 3-5.

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Table 3-5. Updated Watershed Activities from the San Diego Bay WURMP Document.

San Diego Bay Watershed	Hydrologic Area								High Priority Pollutant Categories											
	908.1	908.2	908.3	909.1	909.2	909.3	910.1	910.2	910.3	Bacteria	Dissolved Minerals	Gross Pollutants	Metals	Nutrients	Oil & Grease	Organics	Pesticides	Sediment	Trash	
<b>WATER QUALITY ACTIVITIES</b>																				
Storm Drain Litter Control Techniques – El Cajon Boulevard																				
Storm Drain Inlet Retrofit for Chollas Creek	X																			
Watershed Protection Project (2-08)																				
Treatment Control BMP Pilot Projects (34)	X																			
Update Recycling and Solid Waste Ordinance (35)				X																
Targeted Municipal Facility Inspections (36)		X																		
43 <sup>rd</sup> and Logan Biofiltration Project (37) (NEW)	X																			
City of San Diego Strategic Plan Implementation (38) (NEW)	X	X	X	X																
<b>EDUCATION ACTIVITIES</b>																				
Provide Homeowner's Association Education About Pet Waste Disposal (39)				X																
Storm Water Education Booth at Annual Pet Festival & Doggy Dash (40)				X																
Fats, Oils, and Grease (FOG) Program (41)				X																

\* Numbers in parenthesis ( ) indicate the order in which the watershed activity summary sheets are presented in this Annual Report.

The allotted identification numbers assigned to each of the watershed activities, as presented in Tables 3-1 and 3-5 in this Annual Report, will start sequentially starting this reporting period. When a new watershed activity is implemented and is added to the San Diego Bay WURMP Strategic Plan during this permit cycle, it will be assigned the next available identification number. The San Diego Bay Copermittees have made some modifications to the original 2008 WURMP Strategic Plan. One modification to the presentation of the Strategic Plan was to organize activity summaries to better demonstrate Copermittee collaboration. Unified activity summary sheets for efforts such as enhanced and expanded street sweeping programs and cleanup events were developed to show how the programs in various individual jurisdictions are related to each other.

Another modification was articulating the collective Watershed Strategy more clearly. The San Diego Bay Copermittees revised the Strategic Plan table to better demonstrate how BMPs and other types of activities relate to the high priority water quality problems at a sub-watershed or HA level. The Copermittees organized the water quality activities under two categories: 1) Load Reducing and Source Abatement or 2) Additional Monitoring and Source Identification. Then, similar activities within the Load Reducing and Source Abatement Category were further grouped into subcategories. These subcategories include: Trash and Debris-related activities, Enhanced Inspection Activities, Targeted Special Study Activities, and TMDL-related Activities. By structuring the water quality activities in this manner, the Copermittees demonstrate how existing activities fit within the collective watershed strategy and can determine whether these efforts are utilizing available resources efficiently and effectively. This modification will also aid the Copermittees during the planning and development of future activities.

#### **3.5.2.2 WURMP Program Revision**

In April 2008, the RWQCB and its consultant, PG Environmental, conducted an audit of the WURMP programs within the San Diego region. The review focused primarily on the Carlsbad and San Diego Bay WMAs. The final audit report was delivered to the San Diego Regional Copermittees in September 2008. The audit report included overall comments on the watershed programs, assessments of individual watershed activities, and an analysis of the efficacy of the Permit's WURMP requirements as currently written. It also recommended that a dialogue be initiated between RWQCB staff and San Diego Regional Copermittees to amend permit language where necessary to better meet program goals.

The San Diego Regional Copermittees, through the Regional WURMP Workgroup, initiated dialogue with RWQCB staff on these issues in November 2008. The San Diego Bay Copermittees are committed to continue their involvement in this process during the 2008-2009 reporting period and subsequent years. It is anticipated that some changes to the Five-Year Strategic Plan may be necessary based on the outcome of the ongoing discussions between the San Diego Regional Copermittees and the RWQCB.

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## **Section 4: Effectiveness Assessment**

An effectiveness assessment is an integral part of WURMP implementation because it helps determine whether receiving water quality improvements can be associated with WURMP activities. It also enhances program planning by providing feedback on activities and strategies, and by identifying program areas needing improvement. The following section presents the mechanisms used by the San Diego Bay Copermittees to assess the effectiveness of the WURMP as required by Section J.1.b. of the Municipal Permit.

Effective implementation of the WURMP is dependent on the establishment of comprehensive and program-wide goals as well as objectives and tasks. The San Diego Bay WURMP specifies four overarching management questions that are the cornerstone of the San Diego Bay Copermittees' programmatic assessment. The questions below are designed to assist in evaluating the activities in order to conduct a comprehensive WURMP assessment.

1. Are the San Diego Bay Copermittees making progress towards achieving their program goals and objectives in a way that maximizes resources, is cost effective, and achieves the maximum water quality benefit possible?
2. How well have the San Diego Bay Copermittees maximized the effectiveness of individual activities?
3. Are the San Diego Bay Copermittees effectively targeting identified pollutant sources of high priority water quality problems?
4. Are the San Diego Bay Copermittees observing an improvement in the water quality – both urban and receiving waters – of the WMA as shown through water quality assessments?

These management questions enable the San Diego Bay Copermittees to explore, in detail, the effectiveness of programs and activities implemented within the San Diego Bay WMA.

### **4.1 Assessment of Overall WURMP Effectiveness**

#### **4.1.1 Integrated WURMP Activities Assessment**

In accordance with the San Diego Bay WURMP document, Copermittees selected activities and the associated effectiveness assessment mechanisms to implement in their individual jurisdictions while working within the collective goals of the WURMP. The activities and their assessments vary from one activity to another based on the identified targeted outcomes applicable to each activity, the pollutant(s), pollutant source addressed, and the HA in which it is located. The goals and objectives of the individual activities ensure individual accountability, provide direction, and allow for meaningful assessment. In this section, the San Diego Bay

Copermittees will assess whether they were able to maximize the effectiveness of these individual activities on a watershed level.

The Copermittees measured the effectiveness of the watershed activities as a whole, by compiling the data and detailed information from each individual activity's assessment or at a programmatic level to present a comprehensive assessment of activities. A thorough evaluation of the activities, their relevance to each other and to the high priority water quality problems and their sources will enable the Copermittees to determine if activities are effectively targeting high priority pollutants and/or sources, or if modifications are necessary.

The San Diego Bay Copermittees have been successful in implementing watershed water quality and education activities that resulted in reduced discharge loads, abatement of potential sources, or in other quantifiable benefits to receiving water quality during this reporting period. As discussed in Section 3.1 and 3.2, each Copermittee determined the appropriate assessment mechanisms for each of their activities. Table 4-1 presents each individual water quality activity's effectiveness assessment mechanisms and identifies whether or not the activity achieved the stated goals. The Copermittees' assessments of the individual activities indicate nearly all of the water quality activities were able to achieve the stated goals and were effective in obtaining targeted Outcome Levels Three and/or Four. Copermittees were able to show their activities were effectively addressing high priority water quality problems by providing assessment data for programs such as the Pet Waste Bags Programs, Enhanced Street Sweeping, Cleanup Events, Enhanced Inspections, and the Chollas Creek Water Quality Protection and Habitat Enhancement Special Targeted Study. The activities not meeting their stated goals were unable to complete all of the listed assessment mechanisms during this reporting period. This included the quantification of either the amount of debris collected or the estimated load reductions of either metals or bacteria through the determination of the optimal frequency of inspections. In addition, four of the five Targeted Special Studies implemented during this reporting period were either in planning stages or were acquiring necessary equipment. Therefore, these activities were unable to provide the appropriate assessment data.

The comprehensive evaluation of existing activities, BMPs, and assessment strategies pertaining to watershed programming provides the San Diego Bay Copermittees with a valuable resource and a laundry list of effective, efficient BMPs and activities. By compiling this data in one place, the Copermittees have the opportunity to access multiple activities and their potential applicability for watershed-wide implementation. This resource can then be shared with other watersheds and jurisdictions to improve programming on a regional basis and further increase the list of BMPs. Sharing the evaluation methods will also help watersheds and jurisdictions improve and enhance their programming. The collaborative and group assessment of the activities also encourages Targeted Special Studies and comprehensive thinking when planning future cooperative activities.

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Table 4-1. Watershed Water Quality Activity Assessment.

Number	Activity Name	Outcome Levels	Assessment Mechanisms	Completed	Effectiveness Assessment Information
1	Pet Waste Bag Programs	Level 3 and 4	Quantity of bags removed or new dispensers added	Yes	All estimated quantity of bags used while some copermitees added new dispensers. Two copermitees also estimated per bag pollutant load.
2	Enhanced Street Sweeping	Level 4	Amount of debris collected and curb miles covered	Yes	Amount of debris and curb miles/broom miles tallied but special study to determine optimal frequency is ongoing.
3	Storm Drain Litter Control Techniques	Level 4	Type and amount of debris collected	No	Recorded the type of debris but not the amount of debris.
4	Cleanup Activities	Level 3 and 4	Amount of trash and number of people	Yes	Recorded amount of trash (lb) and number of people.
5	Clean Community Program	Level 4	Amount of debris collected or water quality monitoring	No	Debris was collected but not quantified.
6	Trash Containment Boom Cleaning with US Navy	Level 4	Inspections, quantification, monitoring, tabulation, reporting	Yes	Routine inspections completed but no collection, efficiency or effectiveness information was available as trash was blocked upstream (no trash on site).
7	Additional Dry Season Construction Inspections	Level 3	Implementation rates, increased inspection frequencies	Yes	Completed 15 inspections. Helped contractors stay vigilant about implementing BMPs during dry season.
8	Targeted Auto-related Facility Inspections	Level 3 and 4	Achieve greater BMP implementation from optimized inspection rates. Inspections, quantification, monitoring, tabulation, reporting	Yes Level 3 No Level 4	One inspection per facility only. Completed 15 inspections (Level 1), 7 follow-up inspections (Level 1). Optimal inspection frequency to be studied in future.
	Targeted Metals-related Industrial Facility Inspections	Level 3 and 4	Achieve greater BMP implementation from optimized inspection rates. Inspections, quantification, monitoring, tabulation, reporting	Yes Level 3 No Level 4	One inspection per facility only. Completed 13 inspections, 2 follow up inspections. Optimal inspection frequency to be studied in future.
	Targeted Restaurant Inspections	Level 3 and 4	Achieve greater BMP implementation from optimized inspection rates. Inspections, quantification, monitoring, tabulation, reporting	Yes Level 3 No Level 4	One inspection per facility only. Completed 17 inspections, 0 follow up inspections. Optimal inspection frequency to be studied in future.

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<b>Number</b>	<b>Activity Name</b>	<b>Outcome Levels</b>	<b>Assessment Mechanisms</b>	<b>Completed</b>	<b>Effectiveness Assessment Information</b>
<b>9</b>	Enhanced Construction Oversight	Level 3	1) Estimating sediment loads per construction site per day when sediment controls are not implemented 2) tracking the number of sediment control BMP implementation issues identified during inspections	Yes	135 inspections were conducted. This was 122 more inspections than required by the Municipal Permit Determined to be effective at ensuring proper BMP implementation at construction sites.
<b>10</b>	La Mesa Business Inspection Supplemental Watershed Questionnaire	Level 2 and 3	Inspections and questionnaires	Yes	The supplemental watershed questionnaire was used for the first time during inspections in 2007-2008.
<b>11</b>	Chollas Creek Water Quality Protection & Habitat Enhancement Project	Level 4	Inspections, quantification, monitoring, tabulation, reporting	Yes	6,000 sq. ft. of stream bed enhanced, 1.5 plus tons of trash and debris removed, Chemistry data shows trend of reduced metals and diazihon.
<b>12</b>	Municipal Rain Barrel Installation and Downspout	Level 4	Inspections, quantification, monitoring, tabulation, reporting	No	Procurement of rain barrels, planter boxes, and rain chains began in the second quarter of 2008. No installation occurred in FY 2008.
<b>13</b>	Dalbergia Street Green Mall Infiltration Project	Level 4	Inspections, quantification, monitoring, tabulation, reporting	No	The work performed in FY 2008 included advertising the project, interviewing design consultants, and approving the selection of the design consultant.
<b>14</b>	Southcrest Park Green Lot Infiltration Project	Level 4	Inspections, quantification, monitoring, tabulation, reporting	No	Project planning began in FY 2007 and was continued in FY 2008.
<b>15</b>	Memorial Park Green Lot Infiltration Project	Level 4	Inspections, quantification, monitoring, tabulation, reporting	No	Project planning occurred in FY 2008.

For this annual San Diego Bay WURMP assessment, the San Diego Bay Copermittees addressed the components identified in the San Diego Bay WURMP document to the best extent possible. This allowed the Copermittees to determine compliance with the Permit and strive to attain the long-term goal of decreasing the sources and reducing the discharge of pollutants from the MS4. The following sections summarize WURMP activities within each HA and evaluate progress of the San Diego Bay WURMP toward meeting Target Outcome Levels One through Six.

#### **4.1.1.1 HA Assessment**

The San Diego Bay Copermittees assessed how well the activities targeted the high priority water quality problems and their sources on a HA level. The Copermittees assessed activities occurring within each HA in order to determine the collective impact the activities have on the targeted high priority pollutants and/or pollutant sources. Table 4-2 presents the water quality activities occurring in each HA, the pollutants each activity addresses, and how the activity fits in with the overall Watershed Strategy set forth in the San Diego Bay WURMP document. This evaluation revealed where the San Diego Bay Copermittee efforts were successful in addressing the high priority water quality problems and whether the activities were or were not effectively targeting identified pollutant sources in each HA during this reporting period.

Evaluation at an HA level provided an assessment of the effectiveness of the San Diego Bay Copermittees' collective efforts for a number of the activities that were implemented across several HAs. These activities presented universal solutions to address high priority water quality problems common to multiple HAs and the common sources of the pollutants of concern, allowing for greater flexibility for each of the Copermittees to participate in coordinated watershed activities. Each of these activities collected similar data to show how these programs were being effective at the both the HA and WMA level. These activities can be applied within different locations at different scales of implementation as determined by each Copermittee within their respective HAs. During this reporting period, the Copermittees identified and implemented four collaborative water quality activities which occurred across multiple HAs, including Pet Waste Bags, Cleanups, Enhanced Street Sweeping, and Storm Drain Litter Control Techniques. Additionally, Copermittees addressed bacteria on a watershed scale by implementing activities targeting various pollutant sources in all HAs.

The San Diego Bay Copermittees may implement different approaches or activities which result in addressing the same pollutant of concern and/or pollutant sources in a HA. The combined effect results in a greater impact on the targeted high priority water quality problems and positively influences the effectiveness and efficiency of the San Diego Bay WURMP. Notably, trash has been effectively addressed through such activities as Cleanup Events, Enhanced Street Sweeping, and Storm Drain Litter Control Techniques. These activities directly addressed the RWQCB 13267 Order requiring cities along Chollas and Paleta Creeks to establish trash cleanup measures and implement programs to address trash and other pollutants.

**Pueblo San Diego HU (908)**

Pueblo San Diego HU had the largest number of activities among the three watersheds. The San Diego Bay Copermittees were successful in implementing activities that addressed nearly all of the high priority pollutants in each of the HAs, and all but Gross Pollutants (908.1 HA) were addressed by one or more water quality activity. In particular, the Copermittees were not only successful in implementing activities that collectively addressed all of the high priority pollutant water quality problems in 908.2 HA, but the activities were also effective in targeting a variety of pollutant sources. During this reporting year, the Copermittees have implemented numerous activities such as the Chollas Creek Water Quality Protection and Habitat Enhancement Project and the Enhanced Street Sweeping Activity that have been effective in addressing the high priority water quality problems and reducing pollutant loads in this heavily urbanized HA. A number of the activities implemented in this HA resulted in Level Four Outcomes for bacteria, metals, sediment, and trash. In addition, the Dry Weather Aerial Deposition Study provided important source information for metals and sediment. Data resulting from this monitoring will enable the Copermittees to make more informed decisions on the BMP implementation that targets these high priority pollutants in the future.

**Sweetwater HU (909) and Otay HU (910)**

The Sweetwater and Otay HUs had fewer high priority water quality problems compared to Pueblo San Diego HU. As such, there were fewer water quality activities implemented in these watersheds. However, the activities implemented addressed bacteria in the HAs in which it was identified as a high priority water quality problem. The San Diego Bay Copermittees targeted and identified a common source of bacteria by implementing the Pet Waste Bags Program in all three HAs. Additional activities targeted other likely sources of bacteria in 909.1 and 910.2 HAs as well. There were no water quality activities addressing Pesticides or Gross Pollutants in the HAs in which the Watershed Strategy determined them to be high priority water quality problems. Future monitoring efforts will aid the Copermittees in determining the appropriate activities to implement to address these issues. The San Diego Bay Copermittees were active in educational efforts addressing pesticides which included providing IPM program information to residents and businesses within the HUs.

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Table 4-2. Water Quality Activities by HA.

HA	High Priority Water Quality Problems	Watershed Strategy Management Action	# of Load Reducing Activities	Load Reduction/Source Abatement Activities	# of monitoring Activities	Monitoring/Source Identification Activities
1 806	Bacteria	Additional Monitoring	3	<ul style="list-style-type: none"> <li>Pet Waste Bag Programs</li> <li>Targeted Restaurant Inspections</li> <li>Municipal Rain Barrel Installation</li> </ul>	1	<ul style="list-style-type: none"> <li>Coordinated Dry Weather Monitoring</li> </ul>
	Gross Pollutants	Additional Monitoring	0		0	
	Metals	Additional Monitoring	1	<ul style="list-style-type: none"> <li>Enhanced Street Sweeping</li> </ul>	1	<ul style="list-style-type: none"> <li>Coordinated Dry Weather Monitoring</li> </ul>
	Oil and Grease	Additional Monitoring	1	<ul style="list-style-type: none"> <li>Municipal Rain Barrel Installation</li> </ul>	0	
	Pesticides	Additional Monitoring	1	<ul style="list-style-type: none"> <li>Municipal Rain Barrel Installation</li> </ul>	1	<ul style="list-style-type: none"> <li>Coordinated Dry Weather Monitoring</li> </ul>
2 806	Bacteria	Load Reductions	8	<ul style="list-style-type: none"> <li>Pet Waste Bag Programs</li> <li>Trash Containment/Boom Cleaning</li> <li>Targeted Restaurant Inspections</li> <li>Chollas Creek Water Quality Protection &amp; Habitat Enhancement Project</li> <li>Dalbergia Street Green Mall Infiltration Project</li> <li>Municipal Rain Barrel Installation</li> <li>Southcrest Park Green Lot Infiltration Project</li> <li>Memorial Park Green Lot Infiltration Project</li> </ul>	3	<ul style="list-style-type: none"> <li>Enhanced Dry Weather Monitoring</li> <li>Coordinated Dry Weather Monitoring</li> <li>La Mesa Monitoring</li> </ul>
	Metals	Load Reductions	7	<ul style="list-style-type: none"> <li>Enhanced Street Sweeping</li> <li>Targeted Auto-related Facility Inspections</li> <li>Targeted Metals-related Industrial Facility Inspections</li> <li>Chollas Creek Water Quality Protection &amp; Habitat Enhancement Project</li> <li>Dalbergia Street Green Mall Infiltration Project</li> <li>Southcrest Park Green Lot Infiltration Project</li> <li>Memorial Park Green Lot Infiltration Project</li> </ul>	5	<ul style="list-style-type: none"> <li>Enhanced Dry Weather Monitoring</li> <li>Coordinated Dry Weather Monitoring</li> <li>La Mesa Monitoring</li> <li>BMP effectiveness Monitoring</li> <li>Dry Weather Aerial Deposition</li> </ul>
	Sediment	Source Identification	5	<ul style="list-style-type: none"> <li>Storm Drain Litter Control Techniques</li> <li>Enhanced Street Sweeping</li> <li>Enhanced construction oversight</li> <li>Chollas Creek Water Quality Protection &amp; Habitat Enhancement Project</li> <li>Municipal Rain Barrel Installation</li> </ul>	5	<ul style="list-style-type: none"> <li>Enhanced Dry Weather Monitoring</li> <li>Coordinated Dry Weather Monitoring</li> <li>La Mesa Monitoring</li> <li>BMP effectiveness Monitoring</li> <li>Dry Weather Aerial Deposition</li> </ul>
	Pesticides	Source Identification	2	<ul style="list-style-type: none"> <li>Chollas Creek Water Quality Protection &amp; Habitat Enhancement Project</li> <li>Municipal Rain Barrel Installation</li> </ul>	3	<ul style="list-style-type: none"> <li>Enhanced Dry Weather Monitoring</li> <li>Coordinated Dry Weather Monitoring</li> <li>La Mesa Monitoring</li> </ul>

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HA	High Priority Water Quality Problems	Watershed Strategy Management Action	# of Load Reducing Activities	Load Reduction/Source Abatement Activities	# of monitoring Activities	Monitoring/Source Identification Activities
908.2	Trash	Load Reductions	4	<ul style="list-style-type: none"> <li>Storm Drain Litter Techniques</li> <li>Enhanced Street Sweeping</li> <li>Cleanup Events</li> <li>Trash Containment/Boom Cleaning</li> </ul>	2	<ul style="list-style-type: none"> <li>Enhanced Dry Weather Monitoring</li> <li>Coordinated Dry Weather Monitoring</li> </ul>
908.3	Bacteria	Load Reductions	5	<ul style="list-style-type: none"> <li>Clean Community</li> <li>Trash Containment/Boom Cleaning</li> <li>Targeted Restaurant Inspections</li> <li>Supplemental Inspection Questionnaire</li> <li>Municipal Rain Barrel Installation</li> </ul>	0	
	Sediment	Source Identification	4	<ul style="list-style-type: none"> <li>Storm Drain Litter Control Techniques</li> <li>Enhanced Street Sweeping</li> <li>Add. DW inspections</li> <li>Municipal Rain Barrel Installation</li> </ul>	0	
909.1	Trash	Load Reductions	6	<ul style="list-style-type: none"> <li>Storm Drain Litter Control Techniques</li> <li>Enhanced Street Sweeping</li> <li>Cleanup Events</li> <li>Clean Community</li> <li>Trash Containment/Boom Cleaning</li> <li>Add. Dry Weather Inspections</li> </ul>	0	
	Bacteria	Load Reductions	4	<ul style="list-style-type: none"> <li>Pet Waste Bag Programs</li> <li>Targeted Restaurant Inspections</li> <li>Inspection Questionnaire</li> <li>Municipal Rain Barrel Installation</li> </ul>	0	
909.2	Pesticides	Additional Monitoring	0		0	
910.1	Bacteria	Load Reductions	1	<ul style="list-style-type: none"> <li>Pet Waste Bag Programs</li> </ul>	0	
	Gross Pollutants	Source Identification	0		0	
910.2	Bacteria	Source Identification	3	<ul style="list-style-type: none"> <li>Pet Waste Bag Programs</li> <li>Targeted Restaurant Inspections</li> <li>Municipal Rain Barrel Installation</li> </ul>	0	

#### **4.1.2 Targeted Outcome Assessment**

In the following sections, the San Diego Bay Copermittees will assess their ability to meet Permit requirements during this reporting period. A comprehensive evaluation of the San Diego Bay WURMP program will enable the Copermittees to determine if the targeted Outcome Levels One through Six were addressed.

##### **4.1.2.1 Level One Outcome – Compliance with Activity-Based Permit Requirements**

A Level One assessment addresses the fundamental requirements prescribed in the Permit, including programs and activities that are intended to benefit water quality. Table 4-3 lists how the San Diego Bay Copermittees have met Level One objectives and maintained compliance with the Permit requirements.

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Table 4-3. Level One Outcomes.

<b>Permit Requirements</b>	<b>Objective</b>	<b>Activities</b>	<b>Status</b>
Provide a comprehensive description of activities conducted to meet requirements of Section J of the Permit	Assessment of receiving water quality	<ul style="list-style-type: none"> <li>2007-2008 Urban Runoff Monitoring Report</li> </ul>	<b>Complete</b> 2007-2008
	Implementation of long- and short-term activities to address high priority water quality problems	<ul style="list-style-type: none"> <li>See Section 3 of this Annual Report</li> </ul>	On-going
	Implementation of watershed-based education program	<ul style="list-style-type: none"> <li>Public Presentations and Media/Watershed Element</li> <li>IPM Campaign</li> <li>School Programs</li> <li>Project Clean Water</li> <li>Partners in Clean Water</li> </ul>	On-going On-going On-going On-going
Develop mechanism or public participation	Enhance public understanding of sources of water pollution	<ul style="list-style-type: none"> <li>Project Clean Water</li> <li>Watershed URMP Workgroup</li> <li>Integration/Participation in Land Use Planning</li> <li>Otay Special Area Mgmt Plan</li> <li>Otay River Watershed Mgmt Plan</li> <li>Discretionary Project Review Process</li> <li>Direct Interaction</li> <li>Cleanup Events</li> <li>Community Events</li> <li>Presentations</li> <li>Workshops and Conferences</li> <li>Watershed Stewards Program</li> </ul>	On-going On-going On-going On-going On-going On-going On-going On-going On-going Complete
Develop mechanism to facilitate collaborative “watershed-based” land use planning	Integrate watershed principles into land use planning	<ul style="list-style-type: none"> <li>General Plan Updates</li> <li>Otay River Watershed Mgmt Plan</li> <li>Otay Special Area Mgmt Plan</li> </ul>	On-going On-going On-going
WURMP Update	Develop/expand methods to assess and improve water quality	<ul style="list-style-type: none"> <li>See the WURMP Update and Annual Report</li> </ul>	On-going
Identify watershed efforts not included in annual monitoring report (e.g., special investigations)	Develop/expand methods to assess and improve water quality	<ul style="list-style-type: none"> <li>Regional Harbor Monitoring Program</li> </ul>	On-going
Identify water quality improvements or degradations	Develop/expand methods to assess and improve water quality	<ul style="list-style-type: none"> <li>2007-2008 Urban Runoff Monitoring Report</li> </ul>	<b>Complete</b> 2007-2008

**4.1.2.2 Level Two Outcome – Changes in Knowledge/Awareness and Level Three Outcome – Behavioral Change/BMP Implementation**

The Permit states that Watershed Education Activities are in active implementation phase when “changes in attitudes, knowledge, awareness, or behavior can be reasonably established in target audiences.” This definition corresponds with Level Two and Three Outcomes discussed in the WURMP document. In order to assess education activities, the San Diego Bay Copermittees have established and used several means, such as collecting data, for evaluating education program effectiveness. Data collected during this reporting year includes the amount of trash picked up at cleanup events, the number of participants, and pre- and post-tests and surveys. In addition, Copermittees provided storm water educational materials (i.e. brochures, fliers, and various giveaways) at many events such as the Earth Day at Imperial Beach Pier event and cleanups. Copermittees were also involved in supplemental educational activities that provided watershed information such as posting ads on transit shelters, billboards, and mobile ads.

Table 4-4 is a list of the activities that were in active implementation phase during the reporting year and in which assessment data was collected during this reporting period. The table also list the HA(s) where the activities take place and the high priority pollutants addressed. Details on each of the implemented education activities are in Appendix G. Table 4-5 provides overall assessment data information collected for education activities during this reporting period. The assessment information can be used by the San Diego Bay Copermittees as a tool for planning future education activities and events that are able to reach Level Two and Three Outcomes.

During this reporting year, there were 14 education activities, trainings, and events in which assessment data was collected. Overall, the collected data shows that education activities are positively impacting the public and leading to changes in knowledge about storm water. Notably, the San Diego Bay Copermittees showed significant success in promoting positive behavior change in school children through school programs and outreach.

An education highlight of the reporting year was that the San Diego Bay Copermittees, along with other watersheds, collaborated on the co-sponsorship of the San Diego County Fair, including the staffing of a booth and distributing IPM education information. A region-wide survey was implemented at the San Diego County Fair, the results of which will be reported in the FY 08-09 Regional Urban Runoff Management Program (RURMP) Annual Report.

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Table 4-4. San Diego Bay WURMP Watershed Education Activities in FY 07-08.

San Diego Bay Watershed Education Activities	Hydrologic Area										High Priority Pollutant Categories							Assessment Data		
	908.1	908.2	908.3	909.1	909.2	909.3	910.1	910.2	910.3	Bacteria	Dissolved Minerals	Gross Pollutants	Metals	Nutrients	Oil & Grease	Organics	Pesticides		Sediment	Trash
Outreach Booth for Fire Open House							X				X									Hotline calls increased by approximately 23% from FY06-07 to FY 07-08
Earth Day at the Imperial Beach Pier (April 30, 2008)							X	X			X									500 attended
Hotel Engineers Association Storm Water Training	X	X	X	X																Pre- and Post Tests: Knowledge increased by 8% (Level 2)
SEAL Tour Guide Training	X	X	X	X																Survey: 100% of participants indicated seminar was useful and protecting water quality was important. (Level 2)
Aquatic Adventures – SEA Series Initiative	X	X	X	X																Survey: Test scores improved by 31% (Level 2)
Resource Conservation District – Watershed Education Program	X	X	X	X																Pre- and Post-Tests: Knowledge increase of 20% (Level 2)
Chula Vista Nature Center – Field Trips	X	X	X	X																Pre- and Post-Tests: Knowledge increased by 14% (Level 2)
Aquatic Adventures – Wetland Avengers Field Trips	X	X	X	X																Pre- and Post-Tests: Knowledge increased by 9% (Level 2)
Maritime Museum of San Diego – Pilot Boat Program	X	X	X	X																Pre- and Post-Tests: Knowledge increased by 172% (Level 2)
Pro Peninsula – Sea Turtle Education Program	X	X	X	X																Pre- and Post-Tests: Knowledge increased by 32% (Level 2)
Operation Clean Sweep	X	X	X	X																Sign-in Sheet: 900 people participated-decrease of 10% (Level 3)
BMPs for Mitigation of Pesticide Runoff from Urban Landscapes	X	X	X	X													X			Survey: 100% of participants indicated seminar was useful (Level 2)
Integrated Pest Management for Landscape Professionals	X	X	X	X													X			Survey: 100% of participants indicated seminar was useful (Level 2)
San Diego County Fair	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Survey: 1,200 surveys completed – analysis in FY 08-09 Annual Report

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The San Diego Bay Copermittees feel that they are making strides towards implementing education activities that result in Level Two Outcomes. The San Diego Bay Copermittees will continue to evaluate their education programs in order to improve public knowledge and awareness.

Table 4-5. Assessment of the San Diego Bay Education Program FY 07-08.

Program	Number of Events	Events with Assessment Data	Average Change in Knowledge or BMP Implementation	Number of Participants/ Web Hits	Total Waste Collected/ Recycled
Public Presentations and Media	125	7	54% increase in knowledge. 2110 gal recycled, 181 tons of trash and debris collected, 500 people at Earth Day	1,210,000	N/A
School Programs and Outreach	16	6	46% increase	78,000	N/A
Partners in Clean Water	18	2	10% Decrease in participation	20,000	73,000 lbs
Integrated Pest Management	9	3	100% said seminar was useful. Regional - over 1,200 Surveys collected at SD County Fair	15,000	N/A
Project Clean Water Website	N/A	N/A	N/A	6,283	N/A

Several water quality activities also demonstrated a Level Three Outcome during this reporting period. Through the Enhanced Inspection Activities, the San Diego Bay Copermittees were able to use the inspection data to ascertain if the activity was effective in ensuring the proper BMP implementation in their jurisdictions. Routine inspections of industrial, commercial, and construction sites by the Copermittees provide a tool for assessing behavioral changes and ensuring the proper implementation of appropriate BMPs by businesses and construction site managers. Several San Diego Bay Copermittees have enhanced their inspection programs to address specific watershed concerns. Site inspections have allowed the Copermittees to assess the level of knowledge these businesses and construction site managers have with respect to storm water pollution prevention.

Positive changes in behavior and improved BMP implementation were also noted from the following activities: Additional Dry Season Construction Inspections; the Targeted Auto, Industrial, and Restaurant Facility Inspections; the Enhanced Construction Oversight; and La

Mesa's Business Inspection Supplemental Questionnaire Activity. Additional information on these inspection activities is presented in Section 3 and Appendix E of this Annual Report.

The number of people using publicly available HHW collection facilities located within the San Diego Bay WMA and the amount of waste collected at these facilities provides another tool to assess behavioral change and proper BMP implementation. The amount of HHW collected represents a quantity of potential storm water pollutants from residential areas that have been captured and removed from the waste stream. Data collected from San Diego Bay Copermittees shows that more than 6,000 individuals made use of HHW collection facilities in the San Diego Bay WMA and disposed of approximately 195.8 tons of HHW during FY 07-08.

The Pet Waste Bag activity was also successful at meeting a Level Three Outcome. The increased use of pet waste bags by pet owners is another example of positive behavioral change and the implementation of appropriate BMPs. The San Diego Bay Copermittees provided pet waste bags at various public locations, typically parks and public walkways. By providing pet waste bags, the San Diego Bay Copermittees have been able to increase public awareness of pet waste as a source of bacteria and increase the implementation and use of this BMP by the general public. The use of pet waste bags helps to reduce pet waste from entering the storm water conveyance system.

#### **4.1.2.3 Level Four Outcome – Load Reduction**

In order to determine whether an activity reached a Level Four Outcome, the San Diego Bay Copermittees collected information that measured load reductions resulting from changes in behavior or BMP implementation. The San Diego Bay Copermittees have implemented water quality activities that allow for a quantification of high priority pollutants that are intercepted or prevented from entering the MS4 or receiving water in order to provide a measure of load reduction. Overall, the San Diego Bay Copermittees accomplished the goals set forth in the majority of load reduction activities. Data was collected to show reductions of high priority pollutant loads for the Pet Waste Bag, Enhanced Street Sweeping, and Cleanup activities. Though information was provided on the type of debris collected by the Storm Drain Litter Control Techniques Activity, the amount of debris was not quantified. Future efforts will focus on obtaining the appropriate information.

Individual or group-sponsored cleanup events represent another activity that significantly reduced pollutant loads within the WMA. Cleanup activities conducted throughout the San Diego Bay WMA during FY 07-08 removed approximately **416.8 tons** of trash and debris from the watershed's main tributaries, tidelands, and the San Diego Bay. Approximately **7.67 tons** were collected during the 2008 Creek to Bay Cleanup. This was the fourth year in a row in which the San Diego Bay Copermittees co-sponsored this cleanup event. In addition to resulting in a significant load reduction, these cleanup activities also provided an important outreach opportunity to citizens within the WMA. The San Diego Bay Copermittees will continue to conduct cleanup events in all jurisdictions.

The Enhanced Street Sweeping Activities significantly reduced the amount of high priority pollutants associated with roads and parking lots entering the storm water conveyance systems throughout the WMA. For this reporting period, the San Diego Bay Copermittees removed an additional **1,767 tons** of material and covered an additional 19,861 curb miles (1,270 broom miles in City of San Diego) by increasing the frequency of street sweeping beyond jurisdictional requirements. This information can be used to indicate the Copermittees are implementing activities to address pollutant load reductions within the watershed. Sweeping for the special study, the Targeted Aggressive Street Sweeping Pilot Project began in the spring of 2008 and is anticipated to continue through the summer of 2010. The goal of this activity is to evaluate the effectiveness of new street sweeping equipment and different sweeping frequencies which may result in more efficient pollutant removal.

A targeted special study implemented in the San Diego Bay WMA was also successful in demonstrating a Level Four Outcome during this reporting year. Chemistry data from Chollas Creek upstream and downstream of the Chollas Creek Water Quality Protection and Habitat Enhancement Project study area indicated a trend of reduced metals and diazinon concentrations. This multi-faceted special study includes outreach, education, stewardship development, and habitat restoration which included the enhancement of approximately 6,000 sq ft of channel and the removal of 1.5 tons of trash and debris.

Based on water quality measurements within the San Diego Bay WMA, diazinon concentrations show a continued decreasing trend. A decrease in concentrations of diazinon also represents a load reduction. The discussion of Level Five effectiveness presented below provides additional information on decreases in diazinon concentrations within the WMA.

Based on Level Four assessment discussed above, the San Diego Bay Copermittees believe that the current programs are effective in protecting and improving water quality. The Copermittees expect that future agreement and collaboration on data standards and reporting will allow for trend analyses that further describe the effectiveness of the San Diego Bay WURMP.

#### **4.1.2.4 Level Five Outcome – Changes in Urban Runoff and Discharge Quality**

The results from the *San Diego County Municipal Copermittees Urban Runoff Monitoring Report* indicate that urban runoff water quality remained similar to conditions reported in the WURMP document. Organophosphate pesticides (Diazinon, Chlorpyrifos, and Malathion) were below their respective benchmarks. The continued downward trend of diazinon concentrations in storm water is a positive indication that the San Diego Bay Copermittees' current education and outreach efforts to address diazinon are adequate. The San Diego Bay Copermittees believe that overall, the concentration of diazinon will continue to decrease. Even though diazinon was banned from sales, it is possible that there are still unused diazinon-containing products being stored and used by residents and businesses. As residual diazinon public supply and use is

exhausted, it is possible to see transient, isolated incidents such as this. Diazinon will continue to be monitored and sampled to determine overall statistical trends.

#### **4.1.2.5 Level Six Outcome – Changes in Receiving Water Quality**

A Level Six assessment involves direct measurement of overall water quality in receiving water bodies and evaluates changes in water quality with respect to established regulatory benchmarks, biological integrity, beneficial use, and protection. Validating trends in receiving water quality improvement or degradation generally requires an adequate sample size, so the San Diego Regional Copermittees are continuing to work together to collect water quality data to determine improvements and/or degradations when appropriate. Table 2-2 outlines the water quality ratings for the San Diego Bay WMA and the individual HUs of the watershed based on data collected between 2001-2006 and presented in the Regional Urban Runoff Monitoring Report (Weston Solutions, 2009).

## **4.2 Assessment of TMDL BMP Implementation Plan Effectiveness**

There are three TMDLs adopted by the RWQCB within the San Diego Bay WMA. These TMDLs include:

- Chollas Creek Diazinon TMDL
- Chollas Creek Dissolved Metals TMDL
- Shelter Island Yacht Basin (SIYB) Dissolved Copper TMDL

A brief summary of the current status and the assessment of the Implementation Plans of each TMDL are presented below.

### **4.2.1 Chollas Creek Diazinon TMDL**

#### **Status**

The Implementation Plan for the Chollas Creek Diazinon TMDL was completed in September 2004 and is currently being implemented. The Copermittees within the Chollas Creek watershed (a sub-watershed of the Pueblo San Diego HU (908)) continue to monitor diazinon discharges into the creek and implement an education and outreach program to raise awareness among key audiences regarding the harmful effects of pesticides on the environment. The Copermittees also continue to promote the use of Integrated Pest Management (IPM) practices to reduce pesticide loading into Chollas Creek.

#### **Assessment**

To address diazinon in FY 07-08, the Copermittees continued to promote IPM through jurisdictional IPM seminars and events and through the San Diego regional IPM program. Refer to Section 3.2.1.3 and Table 3-2 of this Annual Report for more details.

A report has also been prepared on the public outreach program and the results of the water quality monitoring conducted in FY 07-08. Refer to Appendix J for the complete report. Highlights demonstrating how the Copermittees successfully contributed to obtaining the TMDL's goal of reducing pesticide loading into Chollas Creek through education and outreach in FY 07-08 include:

- IPM materials were distributed at 25 community events targeting specific audience groups.
- The Copermittees continued to work with the University of California Cooperative Extension (UCCE) to disseminate information on IPM and water quality in both English and Spanish using PSAs, tips cards, and other outreach materials.

The Copermittees continued to conduct monitoring for the Chollas Creek Diazinon TMDL. In summary, diazinon was detected during one storm event (46.6 ng/L on November 30, 2007) at monitoring site SD8(1) above the published chronic benchmark of 45 ng/L, indicating that pesticide applications of diazinon are still occurring within the watershed; however, this result was below the acute benchmark of 75 ng/L. No toxicity was observed in *C. dubia* acute toxicity tests or *C. dubia* chronic toxicity tests during any of the three wet weather monitoring events. As the residual supply of diazinon becomes exhausted, detections of this banned pesticide should continue to decrease, as evident in the monitoring results. The Copermittees have noted a shift in pesticide usage has occurred in recent years toward synthetic pyrethroids. These compounds represent an emerging constituent of concern within San Diego County and should continue to be monitored. A significantly increasing trend in *H. azteca* toxicity has been noted and is correlated to the increasing use of synthetic pyrethroids, which were detected above benchmarks at all sites during all wet weather events.

Based on the monitoring results presented above, the San Diego Bay Copermittees' efforts to address diazinon through education and outreach programs are adequate for meeting the goals of the TMDL. Education and outreach programs and events for area residents and businesses should continue in order to help further reduce pesticide usage within the Chollas Creek watershed and proactively address the observed shift in pesticide usage that has occurred in recent years toward synthetic pyrethroids.

#### **4.2.2 Chollas Creek Dissolved Metals TMDL**

##### **Status**

The Regional Board adopted the Chollas Creek Dissolved Metals TMDL Basin Plan Amendment (BPA) on June 13, 2007. The Office of Administrative Law (OAL) approved the BPA on October 22, 2008. Environmental Protection Agency (EPA) approved the BPA on December 18, 2008. The San Diego Bay Copermittees involved in the TMDL are currently working together to produce an Implementation Plan, which will outline the efforts to be implemented by the jurisdictions to meet the requirements in the TMDL.

### **Assessment**

A full summary of the efforts associated with the Chollas Creek Dissolved Metals TMDL that occurred during FY 07-08 can be found in Appendix E, activity summary 19. The Implementation Plan, which will include an assessment monitoring strategy, is currently being developed by the Copermittees in the Chollas Creek watershed. Therefore, an assessment of the effectiveness of the Implementation Plan for the TMDL is not possible at this time. However, these Copermittees have been successful in proactively addressing the requirements of the TMDL in FY 07-08. Highlights include:

- The Copermittees in the Chollas Creek watershed continued to participate in public comment periods and RWQCB hearings regarding the Chollas Creek Dissolved Metals TMDL in FY 07-08. Participation will contribute to the successful implementation of the TMDL in the future by ensuring that the Copermittees understand the implications of the TMDL in order to be able to proactively and appropriately plan for it.
- The on-going monitoring program for the TMDL contributed to further narrowing data gaps, which will result in the implementation of appropriate, effective, and efficient BMPs.
- The reduction of 1,767 tons of trash and debris in the right-of-ways of the San Diego Bay WMA through enhanced street sweeping activities. These activities addressed the goals of the Chollas Creek Dissolved Metals TMDL by contributing to the reduction of metals through the removal of sediment and debris that metals may bind to.
- The Copermittees in the Chollas Creek watershed proactively began the development of an Implementation Plan using an integrated, tiered, and phased approach to address TMDL and WURMP requirements for the Chollas Creek watershed. The Implementation Plan will guide and focus the efforts of the Copermittees, enabling them to be successful in achieving the goals of the Chollas Creek Dissolved Metals TMDL.

Monitoring information addressing the Chollas Creek Dissolved Metals TMDL is presented in the *2007–2008 Water Quality Monitoring Data Summary for Chollas Creek* report in Appendix J. In summary, monitoring data indicate dissolved copper and dissolved zinc were detected above the Water Quality Objective (WQO) across all sampling locations during wet weather, with the exception of zinc at monitoring site DPR2. Significantly increasing trends were noted for total copper and total zinc at monitoring site SD8(1). Dissolved copper was also detected above WQO concentrations at SD8(1) during ambient weather monitoring. With the exception of dissolved lead, which was low across all storm events and all sites in relation to benchmark values, there was not a clear relationship between upstream and downstream dissolved metals concentrations in either the north fork or south fork of Chollas Creek. For some storm events, dissolved copper and dissolved zinc were higher in the upper watershed sampling locations than at the base of the watershed, while for other storm events, the opposite was true. In addition, aerial deposition may represent a significant pathway for metals pollutant loading in Chollas Creek based on a 2007–2008 Phase II study. Water quality activity summary 24

provides additional detail on the aerial deposition study and is located in Appendix E. Continued monitoring to determine likely sources for metals contamination is recommended.

As the Implementation Plan is still in development, the Copermittees are unable to utilize the above monitoring information to assess the effectiveness of the plan. The FY 07-08 monitoring data will be useful as baseline data against which the Copermittees will be able to measure the effectiveness of the Implementation Plan. This will ensure that the Copermittees are maximizing the effectiveness and efficiency of the activities presented in the Chollas Creek Dissolved Metals TMDL Implementation Plan.

#### **4.2.3 Shelter Island Yacht Basin Dissolved Copper TMDL**

##### **Status**

The relevant San Diego Bay Copermittees are working with the RWQCB and other local stakeholders to develop the Shelter Island Yacht Basin Dissolved Copper TMDL Implementation Plan. The goal of the Implementation Plan will be to achieve a 76% reduction in dissolved copper discharges into the Shelter Island Yacht Basin (SIYB) over the next 20 years.

##### **Assessment**

A full summary of the efforts that occurred in FY 07-08 associated with this TMDL can be found in the SIYB Dissolved Copper TMDL activity summary 16 in Appendix E. The Implementation Plan is being developed; therefore, an assessment of the Implementation Plan is not possible at this time. However, the Copermittees have been successful in proactively addressing the requirements of the TMDL in FY 07-08. Highlights include:

- The Port of San Diego entered into an EPA grant to find viable alternatives to copper-based hull coatings. Transitioning from copper-based hull coatings to alternative coatings will greatly contribute to the reduction of copper loading within the SIYB. The goal of the study is to evaluate new and emerging alternative boat hull coatings in order to provide a list of safer alternative antifouling paints that may be voluntarily applied to boat hulls by the SIYB boating community. The educational and outreach efforts will provide valuable information and guidance to the boating industry on alternative non-copper based antifouling paints and maintenance strategies, resulting in a Level Three Outcome. The transition away from copper-based coatings would aid in the reduction of copper loading into the SIYB, thereby enabling the possibility of a Level Four Outcome by the end of this Permit cycle.
- The Port of San Diego and the consultant, Institute for Research and Technical Assistance (IRTA), held three stakeholder workgroup meetings in FY 07-08 to discuss the Safer Alternative to Copper Antifouling Paints Study and determine the panel field testing protocol that was to be used to evaluate the paints. The panel field testing

protocol was finalized in May 2008. Forty-six non-copper paints were identified for evaluation and static field testing on fiberglass panels was initiated in June 2008.

- The RHMP collected monitoring data within the SIYB in order to characterize current conditions. In addition, the Copermittees plan to use the monitoring data when performing long-term water quality assessments for the SIYB and continue to participate in the RHMP. Detailed information is provided in the water quality activity summary 25 located in Appendix E.

## **Section 5: Conclusions and Recommendations**

### **5.1 Conclusions**

The San Diego Bay Copermittees successfully completed the watershed-based requirements of the Municipal Permit and provided many opportunities for public participation and stakeholder input. Due to the success of the programs implemented during FY 07-08, the San Diego Bay WURMP achieved the following objectives: 1) continued implementation of activities to specifically address the sources of water quality problems at a watershed and HA level; 2) continuation of the comprehensive water quality program, including long-term trend analysis where appropriate; 3) an evaluation of the collaborative effort on a watershed and HA level; 4) continued refinement of the watershed program; and 5) continue progress toward meeting WURMP goals and objectives. In addition, the San Diego Bay Copermittees continued improvements on the water quality assessment for the San Diego Bay WMA during this reporting period.

The San Diego Bay Copermittees have been successful in implementing watershed water quality and education activities that resulted in reduced discharge loads, abatement of potential sources, or in other quantifiable benefits to receiving water quality during this reporting period. The San Diego Bay Copermittees developed or implemented 15 Load Reduction and Source Abatement activities, five of which were Targeted Special Studies. Review of the results of the implemented Targeted Special Studies will provide important information that will enable Copermittees to evaluate if the BMPs are most efficient and effective in dealing with the high priority water quality problems and feasible to implement within their individual jurisdictions. In addition to the on-going educational programs set up under the San Diego Bay Education Program, the Copermittees implemented 14 outreach and training activities targeting audiences identified in the Municipal Permit as having the most significant impact on the high priority water quality problems in the San Diego Bay. During this reporting period, four TMDL related activities and eight Monitoring and Source Identification activities were implemented. The San Diego Bay Copermittees believe these activities provided important monitoring information which is essential to the overall success of the Watershed Strategy. Monitoring information will support future management decisions regarding the planning, implementation, and assessment of watershed activities.

The San Diego Bay Copermittees' assessments of the individual activities indicate nearly all of the water quality activities were able to achieve the stated goals and were effective in obtaining targeted Outcome Levels Three and/or Four. Copermittees were able to show their activities were effectively addressing high priority water quality problems by providing assessment data for programs such as the Pet Waste Bags Programs, Enhanced Street Sweeping, Cleanup Events, Enhanced Inspections, and the Chollas Creek Water Quality Protection and Habitat Enhancement Special Targeted Study.

The Copermittees assessed the effectiveness of the WURMP at an HA level in order to determine the collective impact the activities have on the targeted high priority pollutants and/or pollutant sources. Evaluation of the water quality activities at an HA level provided an assessment of the effectiveness of the San Diego Bay Copermittees' collective efforts for a number of the activities that were implemented across several HAs. These activities presented universal solutions to address high priority water quality problems common to multiple HAs and the common sources of the pollutants of concern. The Copermittees identified jurisdictional water quality activities which were implemented across multiple HAs, such as Pet Waste Bags, Cleanups, Enhanced Street Sweeping, and Enhanced Inspections. Copermittees may also implement different approaches or activities which focused on the same pollutant of concern and/or pollutant sources in a HA. The combined effect results in a greater impact on the targeted high priority water quality problems and positively influences the effectiveness and efficiency of the WURMP program. Notably, trash has been effectively addressed through such activities as Cleanup Events, Enhanced Street Sweeping, and Storm Drain Litter Control Techniques. These activities directly addressed the RWQCB 13267 Order requiring cities along Chollas and Paleta Creeks to establish trash cleanup measures and implement programs to address trash and other pollutants that may be associated with trash. Notably, 416.8 tons of trash and debris were collected throughout the San Diego Bay WMA during cleanup events this reporting year. Of that amount, 7.67 tons were collected during the April 2008 Creek to Bay Cleanup event. In addition, the Enhanced Street Sweeping activity went above and beyond permit requirements and removed an additional 1,724 tons of material and covered an additional 27,403 curb miles (1,270 broom miles for the City of San Diego) within the San Diego Bay WMA. Copermittees have also implemented activities targeting bacteria in all HAs in which the pollutant was identified as a high priority water quality problem.

The 2007-2008 effectiveness assessment conducted by the San Diego Bay Copermittees continued to utilize the Framework Document and demonstrated program effectiveness at many levels. Compliance with activity-based permit requirements is documented (Level One). Examples of activities demonstrating changes in knowledge and behavior, such as Earth Day at Imperial Beach Pier, Integrated Pest Management for Landscape Professionals, Pet Waste Bags, and Enhanced Inspections, are presented (Levels Two and Three) and are fully detailed in Section 4 of this Annual Report. The San Diego Bay Copermittees also assessed load reductions (Level Four) through various programs that either targeted the high priority water quality problems or the pollutant sources. Assessment of trash and debris related activities such as Pet Waste Bags, Storm Drain Litter Control Techniques, Enhanced Street Sweeping, and Cleanup Events resulted in a cross-programmatic watershed analysis of the effectiveness of these programs to address high priority pollutants originating from a variety of sources. Activities such as public participation at cleanup events, the general public's use of household hazardous waste collection facilities, and pet waste bags scaled multiple levels of assessment resulting in increases in awareness, behavior changes, and load reductions.

Although the San Diego Bay Copermittees attempted to further assess changes in receiving water quality during 2007-2008, more thorough assessments will be conducted as additional

water quality information becomes available. Overall, the 2007-2008 effectiveness assessment allowed the San Diego Bay Copermittees to conclude that their watershed activities and program are having positive effects on water quality.

## **5.2 Program Improvements and Recommendations**

The most important contribution that watershed programs can make is to protect and improve water quality in each WMA, including the San Diego Bay WMA. To do this, San Diego Bay Copermittees must first expand the understanding of the water quality issues in the WMA (i.e. the sources and magnitude of the issues), allowing for more informed decisions and actions. This information will allow the San Diego Bay Copermittees, other entities, and watershed partners to make more informed decisions and actions. The comprehensive evaluation of existing activities, BMPs, and assessment strategies pertaining to watershed programming provides the San Diego Bay Copermittees with a valuable resource and a list of effective, efficient BMPs and activities. This resource can then be shared with other watersheds and jurisdictions to improve programming on a regional basis and further increase the list of BMPs Copermittees may potentially implement. Sharing the evaluation methods will also help other watersheds and jurisdictions improve and enhance their programming and vice versa.

The San Diego Bay Copermittees and other entities will continue to utilize the information on watershed pollutants and sources when evaluating and determining which watershed activities to implement. The Watershed Strategy, a key component required for the San Diego Bay WURMP document, provides a consistent mechanism for prioritizing pollutants, identifying sources of pollution, maximizing available resources, and developing and implementing activities. The San Diego Bay Copermittees will continue to gather additional water quality data suitable for assessments at the watershed, sub-watershed, and HA levels, as well as research COC sources and their loading potential. A more thorough identification of sources and their loading potential will enable the San Diego Bay Copermittees to modify program activities and devote resources to specifically target the most troublesome sources using the most efficient BMPs. The San Diego Bay Copermittees will also continue to coordinate to improve data collection and monitoring.

The next step in the evaluation process will be to look at the watershed activities and decide if they are optimized or whether the activities may be further developed to achieve even greater load reductions. The San Diego Bay Copermittees will further evaluate the standardization of incoming data available through the activity summary sheets and comprehensive assessments. The Copermittees could begin to compare activities to each other, deciding if certain activities are able to be combined to increase effectiveness and efficiency, and the activity's ability to address multiple pollutants. This information when combined with monitoring and source identification may promote the positioning of strategically placed watershed BMPs and comprehensive watershed activities. This process entails improving existing data and assessment strategies, which will lead to improved source identification and improvements in

water quality. Monitoring data will help confirm sources and the effectiveness of activities where applicable and feasible.

To this end, the San Diego Bay Copermittees will continue to track existing BMP programs through the use of the activity summary sheets. The overall efficiency of individual watershed BMP programs and of larger scale cross jurisdictional BMP programs will continue to be evaluated as well. The knowledge gained through this evaluation will allow the San Diego Bay Copermittees to further evaluate on-going and newly implemented activities, and learn of new programs initiated on the jurisdictional level that would work well on the watershed or HA level. The potential also exists for the combining of single BMPs into more comprehensive BMPs that tackle multiple pollutants.

Finally, the San Diego Regional Copermittees, through the Regional WURMP Workgroup, will continue dialogue with RWQCB staff to discuss amending permit language where necessary to better meet program goals. The San Diego Bay Copermittees are committed to continuing their involvement in the 2008-2009 reporting period and subsequent years. It is anticipated that some changes to the Five-Year Strategic Plan may be necessary based on the outcome of the ongoing discussions between the San Diego Regional Copermittees and the RWQCB.

## **Section 6: References**

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