

# LAST MINUTE AGENDA INFORMATION

## 02/03/10 Regular Meeting

*(Agenda Related Writings/Documents provided to a majority of the City Council after distribution of the Agenda Packet for the February 3, 2010 Regular meeting.)*

**ITEM NO.**      **DESCRIPTION**

<b>6.3</b>	<p><b>RESOLUTION NO. 2010-6846 – APPROVING FY 2008-09 ANNUAL REPORTS FOR THE SAN DIEGO BAY AND THE TIJUANA RIVER WATERSHED URBAN RUNOFF MANAGEMENT PROGRAMS.</b></p> <ul style="list-style-type: none"><li>a. San Diego Bay Watershed Urban Runoff Management Program 2008-2009 Annual Report.</li><li>b. Tijuana River Watershed Urban Runoff Management Program 2008-2009 Annual Report.</li></ul>
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# **San Diego Bay Watershed Urban Runoff Management Program 2008-2009 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**

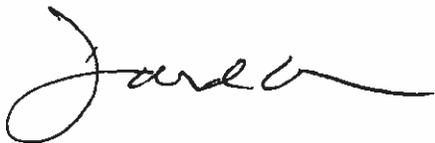
**January 31, 2010**

**2/3/10 Regular Meeting  
Item No. 6.3**

**STATEMENT OF CERTIFICATION**

San Diego Bay Watershed Urban Runoff Management Program 2008-2009 Annual Report

I certify under penalty of law that the San Diego Bay Watershed Urban Runoff Management Program Annual Report for 2008-2009 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 2008-2009 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
ASBS	Areas of Special Biological Significance
BLTEA	Baseline Long-Term Effectiveness Assessment
BMP	Best Management Practices
BOD	Biologic Oxygen Demand
BWE	Baseline Watershed Evaluation
CALTRANS	California Transportation Department
CASQA	California Stormwater Quality Association
CBI	Clean Beach Initiative
CBSM	Community Based Social Marketing
CCC	California Coastal Commission
CMC	Criterion Maximum Concentration
COC	Constituent of Concern
COD	Chemical Oxygen Demand
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
CTR	California Toxics Rule
CWA	Clean Water Act
DDT	Dichlorodiphenyl trichloroethane
DFMP	Drainage Facilities Master Plan
DWM	Dry Weather Monitoring
EIS	Environmental Impact Assessment
EMC	Event Mean Concentration
EPA	Environmental Protection Agency
FOG	Fats, Oils, and Grease Program
FY	Fiscal Year
GIS	Geographical Information System
GPM	Gallons Per Minute
GWSDCC	Groundwork San Diego Chollas Creek
HHW	Household Hazardous Waste
HA	Hydrologic Area
HCH	Hexachlorocyclohexane
HOA	Homeowners Association
HSA	Hydrologic Sub-Area
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

**San Diego Bay Watershed Urban Runoff Management Program 2008-2009 Annual Report  
Acronyms and Abbreviations**

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LID	Low Impact Development
LS	Length Slope Factor
MBAS	Methylene Blue Active Substances
MLS	Mass Loading Station
MS4	Municipal Separate Storm Sewer System
MSCP	Multiple Species Conservation Program
MUSLE	Modified Universal Soil Loss Equation
Municipal Permit or Permit	San Diego Regional Water Quality Control Board Order 2007-0001
NOV	Notice of Violation
NPDES	National Pollution Discharge Elimination System
OAL	Office of Administrative Law
ORWMP	Otay River Watershed Management Plan
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCO	Pest Control Operators
PCW	Project Clean Water
PDP	Pollutant Discharge Potential
PSA	Public Service Announcement
PWQP	Priority Water Quality Problems
RFI	Request For Proposal
RHMP	Regional Harbor Monitoring Program
RURMP	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
SCCWRP	Southern California Coastal Water Research Project
SDA	Special Drainage Area
SDAPCD	San Diego Air Pollution Control District
SDB	San Diego Bay
SDCRAA	San Diego County Regional Airport Authority (Airport Authority)
SDRWQCB	San Diego Regional Water Quality Control Board
SIO	Scripps Institute of Oceanography
SIYB	Shelter Island Yacht Basin
SMC	Stormwater Monitoring Coalition
SQO	Sediment Quality Objective
SSMP	Sewer System Management Plan
SSO	Site Specific Objective
SUSMP	Standard Urban Stormwater Management Plan
SWAMP	Surface Water Ambient Monitoring Program
SWELL	Stewardship Watershed Education for Lifelong Leadership
SWRCB	State Water Resources Control Board

**San Diego Bay Watershed Urban Runoff Management Program 2008-2009 Annual Report  
Acronyms and Abbreviations**

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SWQMP	Stormwater Quality Master Plans
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TKN	Total Kjeldahl Nitrogen
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
WER	Water Effects Ratio
WLA	Waste Load Allocation
WMA	Watershed Management Area
WQO	Water Quality Objective
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) 2009 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. 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. Due to the success of the programs implemented during FY 2009, the San Diego Bay WURMP achieved the following objectives: 1) implementation of activities to specifically address the sources of water quality problems at a WMA 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; and 4) continue progress toward meeting WURMP goals and objectives.

Copermittees implemented 12 water quality activities which effectively addressed high priority water quality problems during this reporting period. The San Diego Bay Copermittees implemented six trash and debris related water quality activities focused on reducing the amount of trash entering the MS4. Six other activities focused on implementing enhanced inspections to abate sources of high priority water quality problems associated with construction activities, large special events, or automotive facilities. In the effort to fill data gaps and improve the characterization of urban runoff and receiving water quality, the Copermittees implemented 12 Monitoring/Source Identification activities. Copermittees implemented 11 education activities to supplement the educational activities occurring within the San Diego Bay WMA as part of the San Diego Bay Education Program which incorporates education activities implemented through existing JURMP, RURMP, or other Storm Water Programs. The Copermittees' assessments of the individual activities indicate nearly all the watershed activities were able to achieve the stated goals and were effective in obtaining outcome targets.

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. Using the Watershed Strategy developed in the 2008 San Diego Bay WURMP document for guidance, each Copermittee individually selected activities that were feasible to institute in their jurisdiction, and were appropriate for its relative contribution to the watershed's high priority water quality problems.

During this reporting period, the San Diego Bay Copermittees continued improvements on the water quality assessment for the San Diego Bay WMA as the result of additional monitoring efforts. The FY 2009 WURMP program assessment involved: 1) the 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 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.

Three major 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. A brief summary of monitoring results and watershed activities implemented in each HU follows.

#### Pueblo HU (908)

During the 2008-2009 monitoring year, the high frequency (three diamond) COCs in Pueblo San Diego HU were generally similar to previous years and correspond to the high priority water quality problems identified in the WURMP Program document. There appear to be links between receiving water and urban runoff water quality results which may indicate a relationship between MS4 effluent and receiving water quality. However, it is unclear what effect MS4 effluent is having on receiving water quality compared to other sources, such as aerial deposition. Receiving water quality within Pueblo San Diego was assessed in Chollas Creek (908.2 HA) which flows during storm events. Observed flow during ambient conditions within the creek is an indication of urban activities. Turbidity and indicator bacteria were identified as high frequency of occurrence COC during wet weather and ambient conditions suggesting a link between urban runoff and receiving water conditions. Total nitrogen and total phosphorus have been recognized within surface runoff emanating from residential and agricultural land uses as well as groundwater. Analysis of dissolved metals such as copper and zinc which are associated with aerial deposition and by transportation and industrial land uses indicate buildup during ambient conditions and then wash off during storm events. The results of monitoring regarding pesticides remained similar to past reporting periods, with Diazinon and Malathion concentrations detected below the acute benchmarks, though Bifenthrin has been identified as a high frequency of occurrence COC. Trash assessments supported the BLTEA rating for trash

in 908.2 and 908.3 HAs, as observations during Dry Weather Monitoring (DWM) indicated sub marginal and poor designations.

Copermittees were successful in implementing activities addressing the high priority water quality problems and reducing pollutant loads in this HU. Ten water quality activities resulted in source abatement or load reductions for bacteria, metals, sediment, and trash. In addition to education activities implemented through the JURMP and RURMP, Copermittees implemented six educational activities as part of the WURMP to address the high priority pollutants. Ten source identification monitoring studies were conducted during this reporting period. Additional receiving and urban runoff monitoring was conducted in 908.1 HA through the Regional Harbor Monitoring Program, SIYB Urban Runoff Monitoring, and Coordinated Dry Weather Monitoring programs. For 908.2 HA, the Copermittees were not only successful in implementing activities that collectively addressed all of the high priority pollutant water quality problems in this heavily urbanized HA, but were also effective in targeting a variety of pollutant sources. The RHMP was conducted throughout the San Diego Bay to assess receiving water quality and provide data for long-term trend analysis. Data resulting from the monitoring activities 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 Copermittees, and other Named Dischargers, assessed the effectiveness of the BMP implementation plans for three adopted TMDLs: Chollas Creek Diazinon and Dissolved Metals TMDLs (908.2 HA) and the Shelter Island Yacht Basin (SIYB) Dissolved Copper TMDL (908.1 HA). Based on the monitoring results from the Chollas Creek Diazinon TMDL, the Chollas Creek Dischargers' efforts to address Diazinon through education and outreach programs are adequate for meeting the goals of the TMDL. During this reporting period, the Chollas Creek Dissolved Metals TMDL dischargers collaborated and developed the BMP Implementation Plan. Though the Implementation Plan was not submitted during FY 2009, the named dischargers, including the US Navy and Caltrans, identified and reported on fifty-one water quality, education, and on-going agency-wide activities which were or will be implemented as part of their comprehensive Storm Water Programs to help meet TMDL requirements. The SIYB Dissolved Copper TMDL Implementation Plan was also in development during this reporting period. Named dischargers included the Port of San Diego, City of San Diego, marinas owners/operators, yacht clubs, and hull cleaners. During FY 2009, the named dischargers were involved in the development of the Implementation Plan, studies to identify non-copper alternative hull coatings, and monitoring activities to assess urban runoff and receiving water quality within the SIYB.

#### Sweetwater HU (909)

There have not been any significant changes to the COCs identified for the Sweetwater HU, though indicator bacteria remain a high frequency of occurrence COC and total coliform was downgraded to a low frequency of occurrence during 2008-2009. Monitoring results are consistent with the BLTEA priority ratings for bacteria in the Lower Sweetwater HA (909.1), but

are not supportive of the A rating for pesticides in the Middle Sweetwater HA (909.2). Organophosphate pesticides including Chlorpyrifos, Malathion, and Diazinon have not been detected at the Sweetwater MLS since 2003. Malathion and Diazinon were detected in receiving water monitoring conducted by the County of San Diego during this reporting year. However, results were below the Basin Plan WQO. 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.

Copermittees implemented five activities with the goal of reducing loads or abating sources of bacteria in this HU. Two additional monitoring studies were conducted during this reporting period. In addition to education activities implemented through the JURMP and RURMP, Copermittees implemented ten educational activities as part of the WURMP to address the high priority pollutants. Educational efforts focused on a variety of audiences in FY 2009. Efforts included the collaborative ILACSD school presentations to provide watershed focused pollution prevention information to elementary students in 909.1 HA, the LID and Watershed Planning Education for Community Planning and Sponsor Groups and the distribution of Integrated Pest Management (IPM) program information to residents and businesses.

#### Otay HU (910)

The Otay HU continues to have a limited amount of data available from which to assess water quality. MLS monitoring data has not been collected in the Otay HU since 2001-2002 due to insufficient flow. However, improvements to monitoring efforts continue to occur. During 2008-2009, an improved assessment of urban runoff water quality was conducted through the MS4 Outfall Monitoring Program, although it did not identify any significant changes to the COCs identified for this HU. Monitoring completed during this reporting year detected elevated concentrations of indicator bacteria within MS4 effluent from various locations in the lower Otay HU. These results coincide with the high priority BLTEA rating for bacteria in both Coronado (910.1) and Otay Valley (910.2) HAs. Receiving water quality monitoring conducted at additional mass loading stations upstream of the Lower Otay Reservoir did not showcase elevated concentrations of indicator bacteria during ambient or wet weather conditions. Monitoring conducted through the RHMP will contribute to long-term trend analysis of receiving water condition. Two additional monitoring studies were also conducted during this reporting period in this HU. Future monitoring, including a 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.

Copermittees identified and targeted a common source of bacteria by implementing the Pet Waste Bag Program in all of the HAs and implemented five water quality activities with the goal of reducing loads or abating sources of bacteria. Copermittees are implementing activities in 910.1 HA which will contribute to bacteria load reductions such as by diverting nuisance storm drain flows to the sanitary sewer system, as well as undertaking source abatement measures to

reduce pollutant sources from trash areas in 910.2 HA. All ten of the watershed education activities implemented in this HU effectively targeted bacteria.

### Watershed Assessment

The Copermittees have achieved the Outcome Levels One through Five on a watershed level during this reporting period. 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. An increase in knowledge and awareness were demonstrated through various education activities throughout the WMA (Level Two). Through inspection activities, Copermittees were able to demonstrate positive changes in behavior (Level Three). The San Diego Bay Copermittees also achieved load reductions as well as source abatement (Level Four) through various programs that either targeted the pollutants of concern or the pollutant sources. Notably, 530 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, 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. Also of note, the long-term downward trend of diazinon in stormwater is a positive indication that the concentration of this pesticide will continue to decrease (Level Five).

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 WMA 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. Continuing to identify 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.

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## **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). Since 2002, the San Diego Bay Watershed Copermittees have worked together to successfully implement the San Diego Bay WURMP, a collaborative effort to address high priority surface water quality issues throughout the San Diego Bay WMA. On March 24, 2008, the San Diego Bay Watershed Copermittees began implementation of the current San Diego Bay WURMP. The program includes identifying and addressing high priority water quality problems in the WMA, 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 highlights the efforts of the San Diego Bay Watershed Copermittees, referred to throughout this document as San Diego Bay Copermittees, during this reporting period from July 1, 2008, through June 30, 2009. This Annual Report is divided into five sections as presented below.

- Section 2 This section 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 This section describes the Watershed Water Quality and Watershed Education Activities that occurred during this reporting period, collaborative land use planning, and additional education and public participation activities that took place. This section also summarizes the TMDL-related activities implemented by named dischargers of TMDLs within the San Diego Bay WMA. Detailed information on the results and status of each Named Dischargers’ TMDL activities is located in Appendix E.
  
- Section 4 This sections 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. This section includes an assessment of compliance with TMDLs in the San Diego Bay WMA and the effectiveness of activities implemented by the Named Dischargers.

Section 5 This section provides conclusions reached during FY 2009 as well as recommendations for future reporting periods.

In addition, this document functions as the primary reporting mechanism for all TMDL activities implemented for each approved TMDL in the San Diego Bay WMA. There are three approved TMDLs in the San Diego Bay WMA: Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL, and the Shelter Island Yacht Basin (SIYB) Dissolved Copper TMDL. A number of the San Diego Bay Copermittees are Named Dischargers in one or more of these TMDLs. The Named Dischargers of the Chollas Creek Dissolved Metals TMDL, which include Caltrans and the United States Navy, took a holistic approach to planning, implementation, and assessment of targeted watershed activities identified in the Implementation Plan. The Implementation Plan fully integrates with existing watershed, regional, and jurisdictional programs (as well as agency-wide programs for state and federal Dischargers) under existing National Pollutant Discharge Elimination System (NPDES) permit requirements. The integration of these activities provides a comprehensive evaluation of watershed-wide efforts to address a particular TMDL. As a result, this document provides a logical platform for annual reporting of efforts to address TMDLs within the San Diego Bay WMA.

#### **1.1 WURMP 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 11 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 development and implementation of the San Diego Bay WURMP.

During this reporting period, the San Diego Bay Copermittees continued to collaborate extensively on the development of the watershed strategy that guides WURMP activity selection. An extensive explanation of the San Diego Bay Watershed Strategy (Watershed Strategy) was presented in the San Diego Bay WURMP document. The *Water Quality Control Plan for the San Diego Basin* (SDRWQCB, 1994) defines the San Diego Bay WMA as being comprised of three watersheds, or hydrologic units (HUs). They are the Pueblo San Diego Watershed, the Sweetwater Watershed, and the Otay Watershed. These HUs are further divided into hydrologic areas (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 and education 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 collect similar assessment data to show how these programs are being effective at the both the HA and WMA levels. In addition to the collaborative activities mentioned above, each Copermittee initiated or completed jurisdictional activities that targeted high priority water quality problems within the HAs of their respective jurisdictions, 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 2009 reporting period.

## **1.2 TMDL Named Dischargers Collaboration**

### **Chollas Creek Dissolved Metals and Diazinon TMDLs**

This reporting year represents the first year the Chollas Creek Dissolved Metals TMDL is in effect. It was approved by the State Board Office of Administrative Law on October 22, 2008. During the reporting period, the permitted MS4 dischargers named in the TMDL collaborated on

a multi-pollutant strategy for addressing the TMDL as well as the development of the required Implementation Plan. The named dischargers include five watershed Copermittees, Cities of San Diego, La Mesa, Lemon Grove, County of San Diego, Port District, as well as the U.S. Navy and the California Department of Transportation (Caltrans). In addition to the collaborative Implementation Plan, each discharger developed their own list of activities they participated in or will participate in to address the TMDLs. Dischargers met 12 times over the year, one time per month, and held four stakeholder meetings. The Implementation Plan was submitted on October 21, 2009, to the Regional Water Quality Control Board.

Because the strategy for addressing this TMDL is multi-pollutant and watershed based, the reporting of activities under this TMDL will incorporate those activities for the Chollas Creek Diazinon TMDL as well. The named parties under the Diazinon TMDL include the five Copermittees also listed as dischargers under the Metals TMDL as well as Caltrans and the US Navy. Investigation Order R9-2004-0277 requires status reports of specific implementation elements. Further information on these specific elements is included in the Chollas Creek TMDL Compliance Monitoring Investigation Order R9-2004-0277 2008–2009 Water Quality Monitoring Report in Appendix C.

#### Shelter Island Yacht Basin Dissolved Copper TMDL

Named parties in the Shelter Island Yacht Basin (SIYB) Dissolved Copper TMDL began the process of cooperatively developing a strategy for addressing the TMDL during this reporting period. The strategy includes developing a collaborative TMDL Implementation Plan and a Compliance Monitoring Plan. The named parties include two watershed Copermittees, the Port District and the City of San Diego, and all SIYB marinas and yacht clubs, and hull cleaners. A kick-off meeting was held on January 21, 2009. The named parties met on three other occasions during this reporting year: March 10, 2009; May 19, 2009; and June 4, 2009. The draft implementation and compliance monitoring plans are anticipated to be finalized in FY 2010.

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

There will be no San Diego Bay Watershed map updates included in the FY 2009 Annual Report.

## **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 collecting, 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 *2008-2009 San Diego County Municipal Copermittees Urban Runoff Monitoring Report* (Regional Report) prepared for the San Diego County Municipal Copermittees. The Regional Report provides analyses from monitoring programs required by the Permit as well as special studies conducted by various Copermittees. The Regional Report and the data compiled within 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?*

The San Diego Bay WMA is described in Section 10 of the Regional Report. The San Diego Bay WMA consists of three major hydrologic units (HU): Pueblo San Diego (908), Sweetwater (909), and Otay (910). Each HU varies greatly in terms of size, population, and land use, and each has different water quality issues as a result. Because the amount and type of data available from each HU is not the same, the San Diego Bay Copermittees have addressed each watershed independently to provide a more accurate assessment of the San Diego Bay WMA as a whole. A summary of the analysis including constituents of concern (COCs) and the San Diego Bay WMA assessment are provided herein.

### **2.1 Water Quality and Pollutant Source Assessment Approach**

The watershed water quality assessment methodology used by the San Diego Bay Copermittees is described in the San Diego Bay WURMP Document. The assessment includes

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separate evaluations for receiving waters and urban runoff discharges. This organization follows the general format of the Permit, providing a closer linkage to the Core Management Questions as well as avoiding mixing datasets from programs undertaken for different reasons. Determining the baseline conditions through the various monitoring programs occurring within the watershed allow the San Diego Bay Copermittees to evaluate current conditions and long-term trends in receiving water quality conditions.

Table 2-1 identifies the monitoring programs from which data were used to conduct receiving water and urban runoff water quality assessments. Receiving water quality monitoring programs were used to answer Core Management Questions 1, 2, and 5 whereas Urban Runoff Monitoring Programs were used to answer Core Management Question 3. Various water quality monitoring programs also were used to assess and identify sources of urban runoff. These programs were used to address Core Management Question 4.

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

Program	Constituents Measured	Hydrologic Unit		
		908	909	910
<b>Receiving Water Quality Monitoring Programs</b>				
Mass Loading Stations (MLS) Ambient and Storm Monitoring	Toxicity, Chemistry, Bacteria, and Trash	X	X	
Post-storm Sediment Pyrethroid Monitoring	Grain size, Pesticides, TOC	X	X	X
Rapid Stream Bioassessments	Benthos, Periphyton, and Physical Habitat		X	
Bight 08 Estuary Monitoring	Bacteria, Sediment, Chemistry, Toxicity, and Benthos		X	
Diazinon and Metals TMDL Monitoring in Chollas Creek	Metals, Pesticides, and Toxicity	X		
County of San Diego Southern Watersheds Water Monitoring	Chemistry, Bacteria, Metals, and Pesticides		X	X
Regional Harbor Monitoring Program (RHMP)	Sediment Chemistry, Toxicity, Benthos	<b>San Diego Bay</b>		
<b>Urban Runoff Monitoring Programs</b>				
Dry Weather Monitoring (DWM) and Trash Assessment	Chemistry, Metals, Bacteria, Trash	X	X	X
Coastal Storm Drain Monitoring (CSDM)	Bacteria	X	X	X
MS4 Outfall Monitoring Program*	Bacteria, Metals, Chemistry, and Pesticides	X	X	X
Regional Source Identification Study	Bacteria, Metals, Chemistry, and Pesticides	X		
City of San Diego Aerial Deposition Monitoring	Metals	X		
City of San Diego Dry Weather Bacteria Source Identification Study	Bacteria	X		
Shelter Island TMDL Urban Runoff Copper Monitoring	Metals	X		

\*The MS4 Outfall Monitoring Program consists of wet and dry weather monitoring located at Targeted and Random sites

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 having an adopted TMDL or for which a TMDL is in development.

Sources of pollutants were generally described within Section 3 of the 2008 San Diego Bay WURMP Document. During 2008-2009, water quality monitoring programs and newly implemented source identification studies were conducted to further distinguish sources of pollutants and analyze types of constituents associated with specific land uses. The results of these monitoring programs and source identification studies are intended to aid the Copermittees in the development and implementation of water quality activities and BMPs. A discussion of sources of pollutants is included for each HU.

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

<b>Water Body Name</b>	<b>Pollutant/Stressor</b>	<b>TMDL Status</b>
<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	Dissolved 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

## **2.2 Pueblo San Diego HU**

### **2.2.1 Receiving Water Body Water Quality Assessment**

Water quality data was collected primarily within the San Diego Mesa Hydrologic Area (908.2 HA) within the Chollas Creek Hydrologic Sub-Area (908.22 HSA). Figure 2-1 portrays monitoring locations throughout the Pueblo San Diego HU. Due to the San Diego Regional Copermittees' participation in the Bight 08 Monitoring Program, the Municipal Permit monitoring requirements were adjusted during 2008-2009. As such, receiving water monitoring conducted at the MLS located within Chollas Creek during wet weather was reduced from two storm events to only a single storm event. Ambient receiving water quality monitoring was not conducted in the Pueblo San Diego HU. Historical data associated with ambient monitoring and wet weather monitoring located at the Chollas Creek MLS site SD8(1) was used to establish frequency of occurrence COCs. In addition, the RHMP (see Activity Summary Sheet SDB-025) and monitoring conducted in accordance with the Chollas Creek Dissolved Metals and Diazinon TMDL (Order R9-2004-0277) contribute to the understanding of the condition of receiving water quality found within the Pueblo San Diego HU. Results of these additional monitoring programs were not incorporated into the analysis of frequency of occurrence COCs. However, the results of these monitoring programs are used to reinforce an understanding of the Core Management Questions. As such, the results of these programs will be explained and presented where applicable.

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

Water quality data assessments suggest variable impacts to beneficial uses within the Pueblo San Diego HU depending on ambient versus wet conditions as well as specific water bodies where monitoring occurred. Receiving water quality was primarily assessed at the Chollas Creek MLS site SD8(1). Because ambient receiving water quality was not conducted within Chollas Creek during 2008-2009, historical data was used to determine high frequency of occurrence COCs. Those constituents included:

- TDS
- Turbidity
- Total nitrogen
- Total phosphorus
- Indicator bacteria
- Dissolved copper

Chollas Creek is generally dry during non storm conditions but is influenced from urban runoff in localized areas. During wet weather, high frequency COCs include:

- Turbidity
- TSS
- Indicator bacteria
- Bifenthrin

Figure 2-1. Receiving Water And Urban Runoff Monitoring Locations Throughout The Pueblo San Diego Hydrologic Unit.



Fecal indicator bacteria has been measured above respective benchmarks during both ambient and wet weather conditions at site SD8(1). During wet weather, the receiving waters are also likely impacted by the presence of a range of Bifenthrin, a synthetic pyrethroid. In previous years, toxicity has been observed frequently for *H. azteca* and sporadically for *C. dubia* at this site. Evidence of persistent toxicity to *H. azteca* was identified in wet weather monitoring as a result storm water runoff.

Historical stream bioassessment results indicated evidence of benthic community impairment in the Pueblo San Diego HU, with Very Poor IBI ratings at the site SD8(1) since 2001. The low ratings may be influenced by a number of factors, including poor in-stream physical habitat and the presence of copper, pesticides—several synthetic pyrethroid compounds were detected during wet weather monitoring—or other constituents not monitored in this program.

Monitoring conducted in accordance with the Diazinon and Dissolved Metals TMDL in Chollas Creek (Order R9-2004-0277) occurred at two sites during three storm events within Chollas Creek. Metals results, which are compared to the California Toxics Rule, indicated dissolved copper and zinc concentrations were greater than the chronic criteria (CCC) and acute criteria (CMC) during all three storms at site SD8(1) located in the north fork of the creek. Dissolved lead was greater than the CCC during two of the three storm events. At site DPR2 in the south fork of Chollas Creek, dissolved copper was recorded above the CMC twice and above the CCC during all three storm events. Observances of toxicity to *H. azteca* at site SD8(1) occurred during all three storms and two out of three observances of toxicity to *H. azteca* occurred at Site DPR2. The synthetic pyrethroid Bifenthrin was detected in all samples where toxicity to *H. azteca* was observed and was detected in every sample at both sites in concentrations sufficient to induce toxicity. Diazinon was not detected in any of the samples during all three storm events.

Results of the RHMP water quality monitoring within San Diego Bay during ambient conditions for indicator bacteria were below AB411 standards. RHMP sediment quality monitoring indicated four of five sites at the mouth of Chollas Creek as unimpacted and one site as possibly impacted. However, toxicity was not observed in the samples collected at the mouth of Chollas Creek and dissolved copper results in water were below the California Toxics Rule (CTR).

Overall, the likelihood of conditions in receiving waters to be protective of beneficial uses may vary depending on wet or ambient conditions and the water body where monitoring was conducted. The results of receiving water quality monitoring indicate that Chollas Creek (908.22 HAS) may not be protective of beneficial uses during both ambient and wet weather conditions. Chollas Creek is currently listed in the Basin Plan for potential REC-1 and existing REC-2 beneficial uses as well as uses of water supportive of aquatic and terrestrial ecosystems. Indicator bacteria, including fecal coliform, have been measured above the Basin Plan benchmarks during both wet and ambient conditions indicating possible impairment of the recreational uses in this HSA. The presence of synthetic pyrethroids detected in Chollas Creek storm water samples and sediments are suspected to be the cause of toxicity observed to

freshwater invertebrates further indicating impairment of beneficial uses within the Chollas Creek. However, the initial results of the RHMP indicate that surface waters in San Diego Bay during ambient conditions may be protective of beneficial uses. Indicator bacteria were not detected in concentrations above AB411 standards and toxicity was not observed in samples collected at the mouth of Chollas Creek. The marina stratum sampled during the RHMP had the highest concentrations of dissolved copper and also had the highest percentage of possibly, likely, and clearly impacted sites primarily as a result of marine vessels with copper-based, in-water hull paints that leach copper to the water column and sediment.

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

Core Management Question 2 was addressed by evaluating magnitude of exceedance ratios for wet weather conditions in the receiving waters. The greatest concentration-to-benchmark ratios during wet weather conditions in the Pueblo San Diego HU were observed for indicator bacteria, turbidity, COD, and toxicity to *H. azteca* at the Chollas Creek MLS site SD8(1). The fecal coliform concentration during one storm event was more than 20 times greater than the Basin Plan water quality benchmark. Bacterial concentrations vary widely in storm water runoff, but fecal coliform concentrations at SD8(1) on average have been nine times greater than the benchmark. The turbidity concentration during wet weather in 2008-2009 was approximately four times greater than the benchmark, which is just slightly lower than the historical mean for the site. COD and toxicity to *H. azteca* were each three times their respective benchmark. Historically, COD has been just slightly above the benchmark, while toxicity to *H. azteca* has historically been slightly greater than three times the benchmark.

Historical stream bioassessment ratings conducted in the Pueblo San Diego HU indicate a Very Poor benthic community at SD8(1). Consistent ratings of either Poor or Very Poor since 2002 suggest that the impairment on the benthic community at this station is not an anomaly. This is supported by the 2007-2008 bioassessment results, which also indicated a Very Poor benthic community.

Monitoring conducted in accordance with the Chollas Creek Diazinon and Dissolved Metals TMDL in the San Diego Mesa HA showed that constituent concentrations and magnitude of toxicity are generally higher at the MLS site SD8(1) in the north fork of Chollas Creek in comparison to MLS site DPR-2 located in the south fork of Chollas Creek. The north fork of Chollas Creek is a concrete channel which is an impervious surface whereas the south fork has a natural bottom channel and has had recent restoration work done in portions of the creek.

Ambient surface water quality monitoring within San Diego Bay conducted during the RHMP indicate copper occurred at concentrations above the CTR, primarily within the marina stratum. All stations indicated bacteria results below AB411 standards. Sediment quality objective results from the RHMP indicated that over half of the 60 stations assessed in all of San Diego Bay were classified as unimpacted, 10% were determined to be likely unimpacted, 25% were possibly impacted, 12% were likely impacted, and only one station was clearly impacted which

occurred in Americas Cup Harbor. The marina stratum had the highest concentrations of dissolved copper and also had the highest percentage of possibly, likely, and clearly impacted sites combined, based on the SQO Guidelines.

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

An analysis of receiving water quality trends was performed based on monitoring programs conducted within Chollas Creek 908.22 HSA and throughout San Diego Bay. The trend analysis of constituent concentrations from wet weather monitoring at the Chollas Creek MLS site SD8(1) demonstrate that nitrite, TKN, turbidity, total copper, and total zinc have been increasing at this site whereas concentrations of TDS and Diazinon have been decreasing. Although nitrite and TKN appear to be increasing, their concentrations remain well below the respective benchmark values. At the current observed rate of increase, it does not appear that these two constituents will exceed wet weather benchmarks during the current Permit cycle.

Total copper and total zinc have approximately the same trends as observed during 2006-2007 trend assessment. Turbidity results measured during the 2007-2008 monitoring year were slightly lower than in the preceding year. Although turbidity results have been above the benchmark during wet weather events, the projected yearly increase in turbidity indicates that levels are not increasing at a substantial rate. Although the TDS concentration was above the benchmark during the 2008-2009 storm event, the trend has been decreasing over time. Only two storm events since 1994 have had TDS concentrations above the benchmark value. Future monitoring will determine if this decreasing trend can be sustained.

The bioassessment ratings at site SD8(1) have been Very Poor in nearly all assessments conducted from 2002 to 2007 and there are no apparent trends in the benthic community. Toxicity has frequently been observed in samples collected from Chollas Creek. Between 2001 and 2008, toxicity to *C. dubia* was observed in approximately 30% of samples since 2001-2002 and toxicity to *H. azteca* was observed in over 70% of samples collected from site SD8(1). During the 2007-2008 Monitoring Season, toxicity to *H. azteca* survival and *C. dubia* reproduction was observed; however no trends in the data set are apparent. Monitoring conducted in accordance with the Diazinon and Dissolved Metals TMDL in Chollas Creek observed toxicity to *H. azteca* survival and *C. dubia* reproduction as well. Recent Toxicity Identification Evaluations indicate synthetic pyrethroids as the causative agent of toxicity.

The RHMP study was conducted to assess water and sediment quality and evaluate the condition of aquatic life. Monitoring within San Diego Bay occurred between August 4-25, 2008, and included sixty stations bay-wide. One of the core questions of the study was to evaluate long-term trends for water quality. According to the results:

- Water and sediment quality throughout the harbor samples, including San Diego Bay, appears to be improving based on a weight-of-evidence approach.

- Within the four harbors, dissolved and total copper declined significantly from historical conditions. Other metals which had concentrations below the California Toxics Rule thresholds include dissolved and total nickel and dissolved and total zinc.
- Sediment chemistry quality did not significantly change from historical conditions.
- Low toxicity was found across all harbors and benthic community condition, as assessed by the BRI, also significantly improved.
- Lastly, indicator bacteria levels found in San Diego Bay were far below AB411 standards.

Diazinon has not been detected in storm water samples collected in Chollas Creek HSA over the past two years, and has only been detected during one storm event in the last five years at site SD8(1). Diazinon was also not detected during three storm events at sites SD8(1) and DPR-2 conducted in accordance with the Diazinon and Dissolved Metals TMDL in Chollas Creek. Since Diazinon is no longer commercially available, the decreasing trend for this constituent is expected to continue until it eventually is no longer or seldom detected.

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

Urban runoff discharge water quality was evaluated to answer **Core Management Question #3 – What is the relative urban runoff contribution to the receiving water problem(s)?** As with receiving water quality, urban runoff discharge quality was assessed during ambient and wet weather conditions. Although there are many new monitoring programs, including the MS4 Outfall Monitoring Program, conducted to assess urban runoff, a cause-and-effect relationship between urban runoff and receiving water quality may not be appropriate at this time. As monitoring continues throughout the extent of the Permit, a better evaluation between urban runoff and receiving water quality can be made.

Dry Weather Monitoring (DWM) was conducted throughout the Pueblo San Diego HU during the dry season from May 1, 2008, to September 30, 2008. A total of 188 sites were visited with 126 sites exhibiting flowing or ponded water where samples for field or laboratory analysis could be conducted. Constituent groups that had concentrations greater than dry weather action levels included:

- General chemistry (i.e., conductivity and pH)
- Indicator bacteria (i.e., total coliforms, fecal coliforms, and *enterococci*)
- Nutrients (i.e., ammonia, orthophosphate, and nitrate)
- Turbidity
- Pesticides (i.e., Chlorpyrifos)
- Metals (i.e., dissolved zinc, copper, and cadmium)

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Concentrations of oil & grease, the pesticide Diazinon, and dissolved lead were below action levels in all samples analyzed. The measured value for turbidity exceeded the action level the greatest number of times (24 of 87 samples analyzed) and occurred most often along the north fork of Chollas Creek in the San Diego Mesa HA. Indicator bacteria exceeded dry weather action levels mainly within the San Diego Mesa HA.

Trash assessments conducted during DWM within the Pueblo San Diego HU indicated that trash was a relatively wide-spread issue, with Chollas HSA (908.22) having the greatest amount of trash and the largest number of sites rated Submarginal or Poor. This result coincides with the urbanized population centers, which are also found in the lower portion of the HU.

Coastal Storm Drain Monitoring (CSDM) sites were visited once per month during at least 72 hours of dry conditions within the Pueblo San Diego HU. If flow or ponded water was observed, paired samples were taken from the storm drain outfall and the receiving water. During 2008-2009, there were 32 paired samples and four unpaired samples taken from five CSDM sites within the Point Loma 908.1 HA. There were no exceedances of indicator bacteria in storm drain samples or receiving water samples.

The MS4 Outfall Monitoring Program conducted in the Pueblo San Diego HU was assessed through the Random Dry, Targeted Dry, and Random Wet Weather Monitoring programs. Water quality benchmarks used in the assessment were developed for the Basin Plan and are applicable to receiving waters and do not apply directly to runoff emanating from the MS4. The benchmarks have been used only to help identify areas where MS4 runoff has the potential to contribute to receiving water problems, thus addressing Core Management Question 3. Of the 12 MS4 outfall sites in the San Diego Bay WMA that were monitored as part of the Random Dry Outfall Monitoring Program in 2008-2009, six were located within the Pueblo San Diego HU. Only one site in the south fork of Chollas Creek was ponded and could be sampled. The results indicated elevated concentrations of total phosphorous and total nitrogen.

A total of 24 sites in the Pueblo San Diego HU were visited as part of the Targeted Dry Weather Outfall Monitoring Program, ten of which were flowing at the time of the survey. Thus, 58% of the targeted dry weather sites were ponded or dry. Drought-related restrictions implemented in the summer of 2009 may have helped to reduce flows from some areas. The chemistry data from the flowing and ponded sites were used to address Core Management Question 3 by comparing concentration of chemical analytes in the MS4 runoff to receiving water quality benchmarks for the following constituents: oil & grease, chloride, nitrate, total nitrogen, total phosphorus, TDS, and indicator bacteria (fecal coliform and *enterococcus*). The constituents greater than their respective benchmarks for at least one of the 10 sites assessed were:

- Total nitrogen
- Total phosphorus
- Indicator bacteria (fecal coliform and *enterococcus*)

Concentrations of *enterococci* exceeded the benchmark most frequently followed by fecal coliforms. The results suggest that effluent from the MS4 has the potential to contribute to receiving water problems at those locations where benchmarks were exceeded.

During the 2008-2009 targeted MS4 monitoring, instantaneous loads were calculated based on constituent concentrations and flow at the time of the survey. In general, flows at all of the sites were very low, ranging from less than 1 GPM to a maximum of 3 GPM. Since this reporting period was the first in which this data was calculated, the results should not yet be considered representative of dry weather MS4 urban runoff to be used to determine the contribution to receiving water quality problems. More meaningful temporal and spatial comparisons as well as analysis to receiving water quality can be made as a more robust data set is developed in subsequent years of the MS4 Outfall Monitoring Program.

Four sites throughout the San Diego Bay WMA were assessed during storm events as part of the Random Wet Weather Outfall Monitoring Program. Of these, one site was located in the San Diego Mesa 908.2 HA. The following constituents exhibited greater concentrations than water quality benchmarks:

- Total nitrogen
- Total phosphorus
- Indicator bacteria

The City of San Diego conducted a focused study of bacteria sources in the Chollas Creek tidal prism during September and October 2008 (see Activity Summary Sheet SDB-027). The study focused on sources and the magnitude of dry weather urban runoff and its influence to water quality located at the mouth of Chollas Creek. The results of the study indicate that during dry conditions, the mouth of Chollas Creek is not hydrologically connected to the upstream drainage. Therefore, elevated concentrations of bacteria found in receiving waters are the result of sources which flow directly into the Chollas Creek tidal prism. Four of 17 storm drains which empty into the mouth of Chollas Creek exhibited flow and were sampled and results were compared to receiving water samples. Elevated concentrations of bacteria were found within the storm drain flow and coincided with receiving water concentrations of bacteria.

A special study was conducted by the City of San Diego to determine copper loading from the MS4 into the Shelter Island Yacht Basin in San Diego Bay located in the Point Loma 908.1 HA (see Activity Summary Sheet SDB-053). Monitoring of urban runoff was conducted during three wet weather events as well as during dry conditions. During wet weather conditions, dissolved copper concentrations were detected above the Basin Plan WQO. It was determined that the dissolved copper annual load to the receiving water from the MS4 is below the waste load allocation set for urban runoff in the Shelter Island Yacht Basin TMDL.

A study was conducted by the City of San Diego within the Switzer Creek Subwatershed in the San Diego Mesa HA to assess storm drain sediments with a focus on pesticide distributions and

concentrations (see Activity Summary Sheet SDB-054). Pesticides have been associated with toxicity at the mouth of Switzer Creek in San Diego Bay. Elevated concentrations of Chlordane, DDT isomers, synthetic pyrethroids, copper, lead, and zinc were detected during the study and may be causing toxicity to freshwater and marine organisms.

A Regional Source Identification Monitoring study was conducted by the San Diego County Copermittees in accordance with the Permit (Section B.2 of the Receiving Waters and Urban Runoff Monitoring and Reporting Program). The study attempts to characterize analytes found in urban runoff during dry conditions from single family residential land use and took place within two separate jurisdictions: the City of Del Mar located within the Los Penasquitos WMA and the City of La Mesa within the San Diego Bay WMA. The La Mesa study area discharges to the upper reaches of Chollas Creek in the San Diego Mesa 908.2 HA (Figure 2-1).. Sampling for the study occurred within selected MS4 outfalls on three occasions once per month between May and July 2009. The results of the study indicate that two of the three La Mesa sites had elevated bacteria levels, and one site had an elevated permethrin level. However, a sample taken a month prior indicated permethrin levels below the detection level. Another site within La Mesa where continued flow was observed showed elevated concentrations of chloride, TDS, and total hardness which could indicate a possible groundwater influence.

### **2.2.3 Pollutant Source Assessment**

The identification of pollutant sources attempts to answer **Core Management Question #4 – What are the sources of urban runoff to receiving water quality problem(s)?** During the 2008-2009 reporting period, a variety of monitoring programs incorporated an evaluation of sources contributing to urban runoff, including: Jurisdictional DWM, CSDM, and special studies. The results of these monitoring programs will strengthen the Copermittees knowledge of sources and aid in the development of appropriate watershed activities and BMPs.

The trash assessment conducted in 2008-2009 as part of the Jurisdictional DWM Program was used to identify sources of trash in the Pueblo San Diego HU. A total of 185 sites from three HAs (including all five HSAs) were assessed for trash in the Pueblo San Diego HU. The Chollas HSA (908.22) had the greatest number of sites with Submarginal or Poor ratings, indicating that this portion of the watershed contained the greatest amount of trash in the HU. This result coincides with the urbanized population centers, which are also found in the lower portion of the Pueblo San Diego HU. Trash at the eight sites with Submarginal or Poor ratings consisted primarily of food packaging (four sites) and household waste (four sites) potentially as a result of littering and dumping. The sites determined to be Submarginal or Poor as a result of littering occurred mostly within the San Diego Mesa 908.2 HA along Chollas Creek.

Coordinated dry weather monitoring was conducted by the San Diego Regional Airport Authority, Port of San Diego, and the City of San Diego within Pueblo San Diego (see Activity Summary Sheet SDB-021). The coordinated monitoring occurred at storm drains which exist along shared storm drain lines among the three jurisdictions to better identify sources of dry weather urban runoff. The coordinated monitoring activity did not reveal similar exceedances at

sites along shared storm drain lines. Though Copermittees were unable to positively identify specific sources of dry weather urban runoff in this monitoring program during this reporting year, the results will help to narrow the focus of sources of urban runoff causing the dry weather exceedances within the storm drain system.

The Regional Source Identification Monitoring study of single family residences conducted by the San Diego County Copermittees indicated that sources of dry weather flows most likely were a result of landscape over-irrigation. Additionally, nitrate, chloride, and elevated conductivities were associated with areas influenced by groundwater discharges (which may be a result of perched water tables associated with residential lawn watering).

The City of San Diego has been conducting studies to determine if fallout from aerial deposition represents a significant pathway for metal pollutant loading into the Chollas HSA in 908.22 (see Activity Summary Sheets SDB-024b and SDB-024c). During 2008-2009, Phase III of the study attempted to identify a correlation between high runoff concentrations of metals to high deposition rate areas and compare metal concentrations within urban runoff from different land uses and facility types within the same aerial deposition area. Wet weather sampling, dry weather roof sampling, and surface dust wipe sampling were conducted to assess areas that may have the potential for metals loading. The results of the study were as follows:

- Total and dissolved copper concentrations were positively correlated (higher) with higher percent impervious surface area.
- Copper, lead, and zinc concentrations were higher in commercial and industrial land use areas compared with residential land use.
- Emissions of copper and zinc from stationary facilities near the mouth of Chollas Creek likely contribute to aerial deposition and subsequent runoff of these metals.
- Industrial and commercial activities with uncovered outdoor metal storage and outdoor operations were positively correlated to high levels of copper, lead, and zinc.
- Samples collected from metal rooftops in poor condition (e.g., deteriorating or rust evident) were found to be significantly higher in concentrations of total and dissolved zinc compared with the street level runoff concentrations. Concentrations of copper and lead were relatively low from metal rooftop runoff, but increased in street level runoff, suggesting aerial deposition or other parcel-based sources of copper and lead.
- Average annual aerial emissions of copper from four stationary facilities near the mouth of Chollas Creek are roughly five times higher than the average annual load discharged via storm water runoff. In contrast, lead and zinc emissions were only 1% and 24% of average annual discharge load, respectively.
- Aerial deposition of copper, lead, and zinc accounts for 100%, 29%, and 74%, respectively, of the average annual load discharged via storm water runoff. This suggests that mobile emissions sources (e.g., automobiles and re-suspended dust) and localized parcel-based sources also play a role in metals deposition of lead and zinc.

A focused study of sources of bacteria at the mouth of Chollas Creek was conducted by the City of San Diego within Pueblo San Diego (see Activity Summary Sheet SDB-027). It was determined that during dry conditions, there is no hydrologic connection to the mouth of Chollas Creek from the upper portion of the drainage. Therefore, bacteria found within the receiving waters originate from sources which exist or discharge directly into the mouth of the creek. Four of 17 storm drains which exhibited flow to the tidal prism were monitored for bacteria and the results indicate that high concentrations of indicator bacteria found within runoff may have contributed to the high concentrations of bacteria within the receiving water. Sources of the dry weather flows to storm drains were analyzed and include over-irrigation from a commercial strip-mall and a freshwater slough which periodically discharges to a nearby storm drain. In addition, scour ponds associated with storm drains provide depressions within the streambed where indicator bacteria from the surrounding subdrainage can be maintained. Tidal fluctuations maintain a mixture of brackish water and carries bacteria from ponds to other areas within the tidal prism.

## **2.3 Sweetwater HU**

### **2.3.1 Receiving Water Body Water Quality Assessment**

Receiving water monitoring was conducted during one wet weather event at the MLS located in Sweetwater River. Figure 2-2 displays monitoring locations throughout the Sweetwater HU. Ambient and rapid stream bioassessment monitoring was conducted at two stations within the Sweetwater HU according to the southern California Stormwater Monitoring Coalition (SMC) Regional Watershed Monitoring Work Plan<sup>1</sup>. Historical data associated with both ambient monitoring and wet weather monitoring located in the Sweetwater River were used to establish frequency of occurrence COCs. Additional water quality monitoring conducted by the County of San Diego also contributed to answering the Core Management Questions though the results were not incorporated into the analysis of high frequency of occurrence COCs. The results from additional monitoring will be discussed as appropriate.

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

Core Management Question 1 was addressed by assessing ambient and wet weather data conducted in the Sweetwater HU. Wet weather monitoring was conducted at the Sweetwater River MLS located in the Lower Sweetwater 909.1 HA. Monitoring results indicate that fecal coliform and *enterococci* are high frequency of occurrence COCs while total coliform is a low frequency of occurrence COC during wet weather.

Historical stream bioassessment results previous to 2008-2009 indicated evidence of benthic community impairment in the Sweetwater HU. IBI ratings of Very Poor have been reported at two locations along the Sweetwater River (at Bonita Road located in the Lower Sweetwater HA

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<sup>1</sup> Stormwater Monitoring Coalition Bioassessment Working Group. 2007. *Regional Monitoring of Southern California's Coastal Watersheds*. November, 2007.

and at Highway 94 located in the Middle Sweetwater HA) since 2002. A number of factors, including poor in-stream physical habitat or possibly the presence of toxic constituents not monitored in this program may have influenced this low rating.

SMC Stream bioassessment monitoring which occurred during 2009 was conducted at two sites along the Sweetwater River. One site located in the Lower Sweetwater 909.1 HA and the other was located in the Upper Sweetwater 909.3 HA. The upper Sweetwater site received an IBI quality rating of Good and an IBI score of 42 out of 70 possible points. These results indicate that the upper portion of the watershed may be less impacted due less urban development. The lower Sweetwater site, near to the Sweetwater MLS, received an IBI quality rating of Very Poor and an IBI score of 10 out of 70 possible points corresponding to historical bioassessment condition found in the Lower Sweetwater 909.1 HA.



Figure 2-2. Receiving Water And Urban Runoff Monitoring Locations Throughout The Sweetwater Hydrologic Unit.



Toxicity to *C. dubia* reproduction and *S. capricornutum* growth during wet weather conditions in the Sweetwater HU was observed on October 5, 2008, at the Sweetwater River MLS. In previous years, toxicity has been sporadic at this site. Since 2001, toxicity to *C. dubia* reproduction has been identified in 37% of samples, and toxicity *S. capricornutum* growth has been observed in 42% of samples. No toxicity to *H. azteca* has been observed since 2001. There is no evidence of persistent toxicity at this site in ambient or wet weather monitoring.

The County of San Diego performed monitoring within the Lower and Middle Sweetwater HA to assess water quality during ambient and wet weather conditions (see Activity Summary Sheet SDB-057). Two ambient events were monitored at both sites resulting in exceedances of Basin Plan benchmarks for Nitrate and TDS during both events at each site. Fecal coliform also exceeded the benchmarks at the Middle Sweetwater HA site during one dry weather event. Both sites were monitored during a single wet weather event with results indicating elevated concentrations of fecal coliform at each location.

Results of the Bight 08 and RHMP programs suggest that the receiving waters of the Sweetwater River Estuary are generally protective of beneficial uses. Of the five sites assessed during Bight 08, one was unimpacted, two were likely unimpacted, and two others located in the middle of the estuary were possibly impacted. These two sites had detections of historical constituents including DDT, chloride, lead, PCBs, and zinc. No clearly impacted sites were determined based on the SQO Guidelines. Sediment chemistry presented a moderate exposure, toxicity was either low or non-toxic, and benthic impacts were low at the two possibly impacted sites. The Bight 08 program also determined that water quality results were below the benchmark for bacteria and TSS. In addition, results of the RHMP monitoring indicate that seven of 9 sites sampled in proximity to the Sweetwater River Estuary were likely unimpacted and two of 9 sites were possibly impacted.

Beneficial uses for much of the Sweetwater River include REC-1, REC-2, and uses of water that are supportive of aquatic and terrestrial ecosystems. Elevated concentrations of indicator bacteria at monitoring stations located in both the lower and middle portions of the river suggest that beneficial uses regarding recreation may not be supportive during wet weather. Results from the 2009 SMC Bioassessment Monitoring confirm historic bioassessments conducted within the Lower Sweetwater HA indicating impairment to the benthic community which may not be protective of beneficial uses. SMC Bioassessment Monitoring conducted in the Upper Sweetwater HA are generally supportive of beneficial uses. Recent water and sediment sampling, including Bight 08 and the RHMP, conducted within the tidal prism of the Sweetwater River during ambient conditions indicate that water quality is likely protective of beneficial uses.

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

Core Management Question 2 was addressed with magnitude of exceedance ratios for ambient and wet weather conditions in the receiving waters and a spatial analysis of COC during ambient conditions. The greatest exceedance ratios during ambient conditions in the

Sweetwater Watershed HU were observed for total nitrogen and total phosphorus at the monitoring site located in the Lower Sweetwater HA. Exceedance ratios during wet weather at the Sweetwater River MLS were greatest for fecal coliform bacteria. The fecal coliform concentration during the 2008 storm event was more than 500 times greater than the water quality benchmark. Bacterial concentrations vary widely in storm water runoff, but fecal coliform concentrations at the MLS on average have been 41 times greater than the benchmark. The TDS concentration during wet weather in 2008-2009 was two times greater than the water quality benchmark, which is slightly above the historical mean for the site.

Receiving water spatial patterns in the Sweetwater Watershed HU varied by constituent. During ambient conditions, receiving water concentrations of chloride, total nitrogen, and total phosphorus were greater than their respective benchmarks in the Lower Sweetwater HA, whereas similar constituents were below benchmarks in the Upper Sweetwater HA. These results provide a snapshot of receiving water conditions during the time of the survey. Additional data is needed to provide a more robust assessment of the spatial patterns of water quality constituents within the Sweetwater HU.

Historical stream bioassessment ratings conducted in the Sweetwater Watershed HU indicate a Very Poor benthic community at both monitored locations. The consistent rating of Very Poor at locations along the Sweetwater River at Highway 94 and Bonita Road since 2002 suggests that the extent of the impairment on the benthic community is not isolated to one area. This is supported by the 2008-2009 bioassessment results, which indicate a Very Poor benthic community at all SMC sites monitored within the WMA.

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

Core Management Question 5 was addressed through trend analysis of constituent concentrations from wet weather monitoring over time at the Sweetwater River MLS. Two constituents in particular have shown trends in receiving water quality. Based on the trend analysis, pH is increasing over time at this site, while total lead is decreasing over time. Although pH appears to be increasing over time, concentrations have remained within the acceptable benchmark range of 6.5 to 8.5 pH units. At the current observed rate of increase, it does not appear that this constituent will exceed its wet weather benchmark during the current Permit cycle.

The concentration of total lead has been decreasing over time at the Sweetwater River MLS. In 2008-2009, the total lead concentration was well below the benchmark and has hovered at values that are near or below the detection limit since monitoring began in 2001.

Toxicity has been sporadic at the Sweetwater River MLS site in the Lower Sweetwater HA. Toxicity to *C. dubia* reproduction and *S. capricornutum* growth during wet weather conditions in the Sweetwater Watershed HU was observed during the 2008-2009 Season. Since 2001, toxicity to *C. dubia* reproduction has been identified in 37% of samples, and toxicity *S.*

*capricornutum* growth has been observed in 42% of samples. Toxicity to *H. azteca* has not been observed since 2001. There is no evidence of persistent toxicity at this site in ambient or wet weather monitoring and no trends are apparent at this time.

According to the RHMP, water and sediment quality throughout San Diego Bay, appears to be improving based on a weight-of-evidence approach. Primary indicators of long-term water quality, as well as sediment chemistry, toxicity, and benthic infaunal community all showed significant improvements over historical conditions. The results of the Bight 08 program reinforce these findings and will serve as a baseline to evaluate future trends.

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

Urban runoff discharge water quality was evaluated to answer **Core Management Question #3 – What is the relative urban runoff contribution to the receiving water problem(s)?** As with receiving water quality, urban runoff discharge quality was assessed during ambient and wet weather conditions. Although there are many new monitoring programs, including the MS4 Outfall Monitoring Program, conducted to assess urban runoff, a cause-and-effect relationship between urban runoff and receiving water quality may not be appropriate at this time. As monitoring continues throughout the extent of the Permit, a better evaluation between urban runoff and receiving water quality can be made.

DWM conducted within the Sweetwater HU is primarily located throughout urbanized areas of the watershed within the Lower and Middle Sweetwater HAs. Overall, 72 sites were monitored with 67 sites exhibiting flowing or ponded water where samples could be taken. Constituent groups that had concentrations greater than dry weather action levels included:

- General chemistry (i.e., conductivity and pH)
- Indicator bacteria (i.e., total coliforms, fecal coliforms, and *enterococci*)
- Nutrients (i.e., ammonia, orthophosphate, and nitrate)
- Turbidity

Concentrations of oil & grease, pesticides (i.e., Diazinon and Chlorpyrifos) and metals (i.e., dissolved lead, zinc, and cadmium) were below dry weather action levels in all samples analyzed. The measured value for conductivity exceeded the dry weather action level the greatest number of times (29 of 85 samples analyzed), followed by nitrate (11 of 83 samples analyzed), total coliforms (eight of 32 samples analyzed), and turbidity (seven of 82 samples analyzed).

Trash assessments conducted as part of the DWM program in Sweetwater indicated that while trash was present throughout the HU, the Lower Sweetwater HA had the greatest amount of trash and the largest number of sites rated Submarginal or Poor. Trash at two of the 6 sites with Submarginal or Poor ratings consisted primarily of food packaging, while trash at the remaining

four sites was comprised primarily of household waste, cigarette butts, biohazardous waste, and fabric or clothing.

A single CSDM site, located within the Lower Sweetwater HA along the San Diego Bay, was monitored to assess indicator bacteria through paired sampling of receiving water and urban runoff.. The site was visited once per month and a paired sample was taken from the storm drain outfall and the receiving water if flow or ponded water was observed. During 2008-2009, there was one paired sample taken from the site. There were no exceedances of indicator bacteria in the storm drain sample or receiving water sample during the sampling event.

The MS4 Outfall Monitoring Program which occurred within the Sweetwater HU included the Random Dry, Targeted Dry, and Random Wet Weather components. Four of the 12 sites were visited throughout the San Diego Bay WMA as part of the Random Dry Outfall Monitoring Program located in the Sweetwater HU. Only one of the four random sites was flowing or ponded and could be sampled. The site was located in the Lower Sweetwater HA and results were above the benchmark for total nitrogen, total phosphorus, and indicator bacteria. This site also had the highest nitrate, nitrate-nitrite, and nitrite concentrations, while it had the lowest TKN and total phosphorus in comparison to other sites in the WMA.

Fifteen of the 20 sites in the Sweetwater HU visited as part of the Targeted Dry Weather Outfall Monitoring Program were flowing at the time of the survey. Thus, 25% of the sites were ponded or dry. Drought restrictions implemented in the summer of 2009 may have helped to reduce flows from some areas. The chemistry data from the flowing and ponded sites were used to address Core Management Question 3 by comparing concentration of chemical analytes in the MS4 runoff to receiving water quality benchmarks for the following constituents:

- Total nitrogen
- TDS
- Indicator bacteria (fecal coliform and *enterococcus*)

Each of these constituents had concentrations that were greater than their respective benchmarks at one or more of the 15 sites assessed. Concentrations of *enterococcus* exceeded the benchmark most frequently followed by fecal coliform and TDS. The results suggest that discharges from the MS4 have the potential to contribute to receiving water problems at those locations where benchmarks were exceeded.

A comparison of instantaneous loads, based on constituent concentrations and flow at the time of the survey, suggests that loads were typically greatest where flow rates were highest. Two sites located in the Lower Sweetwater HA had the highest loads of most constituents. MS4 runoff from these sites may have a greater potential for contributing to the receiving waters because of the greater instantaneous loads measured at the time of the surveys.

The 2008-2009 targeted MS4 monitoring data allow for a relative comparison of instantaneous loads among sites in the Sweetwater HU; however, the results should not yet be considered representative of dry weather MS4 runoff in the watershed. More meaningful spatial comparisons can be made as a more robust data set is developed in subsequent years of the MS4 Outfall Monitoring Program.

Four sites were assessed during storm events as part of the Random Wet Weather Outfall Monitoring Program. Concentrations of several analytes were greater than water quality benchmarks at all four sites, including the following constituents:

- Total nitrogen
- Total phosphorus
- Indicator bacteria

These findings suggest that wet weather runoff from the MS4 may have the potential to contribute to receiving water problems at these locations. However, it is important to note that the water quality benchmarks used in the assessment are applicable only to receiving waters and do not apply directly to runoff emanating from the MS4. The benchmarks have been used only to help identify areas where MS4 runoff has the potential to contribute to receiving water problems, thus addressing Management Question 3. Normalized loads calculated for the sites assessed were greatest for most constituents at Site MS4W-SDB-06, located in the Middle Sweetwater HA. This site had the greatest drainage area and is characterized by primarily spaced rural residential, vacant and undeveloped land, and open space land uses.

### **2.3.3 Pollutant Source Assessment**

The trash assessment conducted 2008-2009 as part of the Jurisdictional DWM Program was used to identify sources of trash in the Sweetwater HU. A total of 73 sites were assessed for trash in the HU, including six HSAs. The lower portion of the Sweetwater HU had the greatest proportion of trash and the most sites with Submarginal or Poor ratings, indicating that this portion of the watershed contained the greatest amount of trash. This result coincides with the urbanized population centers, which are also found in the lower portion of the WMA. The potential activities causing trash found at monitoring locations were as follows:

- Littering for four of the sites rated as Submarginal or Poor
- Dumping for four of the sites, and Upstream for one of the sites. The sites listed as Dumping were mostly clustered near the mouth of the Sweetwater River in the 909.12 HSA.

## **2.4 Otay HU**

### **2.4.1 Receiving Water Body Water Quality Assessment (Otay HU)**

The San Diego Bay Copermittees have not collected MLS monitoring data in the Otay HU since the 2001-2002 Monitoring Season due to insufficient flow. Post-storm event synthetic pyrethroid monitoring and third-party studies including the RHMP and the County of San Diego Southern Watersheds Water Monitoring Program was performed in the Otay HU during the 2008-2009. Figure 2-3 displays monitoring locations throughout the Otay HU. In the sediment samples collected at the Otay River TWAS, all of the analyzed pyrethroids were below sediment benchmark values. These results suggest that pyrethroids were not present in the sediment following the storm event at concentrations that cause toxicity to benthic infaunal organisms. Otay River sediments were comprised predominantly of sand and had relatively low amounts of TOC, which may have influenced the amount of pyrethroids present in the sediment. County of San Diego Southern Watersheds Water Monitoring Program dry and wet weather sampling events did not measure any constituents above water quality objectives (Activity Summary Sheet SDB-057).





#### **2.4.2 Urban Runoff Discharges Water Quality Assessment (Otay HU)**

Urban runoff discharge water quality was evaluated to answer **Core Management Question #3 – What is the relative urban runoff contribution to the receiving water problem(s)?** A better assessment of the MS4s contribution to receiving water quality problems was conducted within the Otay HU during 2008-2009 with the addition of the MS4 Outfall Monitoring Program. Although there are many new monitoring programs conducted to assess urban runoff, a cause-and-effect relationship between urban runoff and receiving water quality may not be appropriate at this time. As monitoring continues throughout the extent of the Permit, a better evaluation between urban runoff and receiving water quality can be made.

DWM primarily occurred in urbanized areas of the watershed within the Coronado HA (910.1) and Otay Valley HA (910.2). Overall, 88 sites were monitored with 47 sites exhibiting flowing or ponded water where samples could be taken for field and/or lab analysis. Constituent groups that had measured values greater than action levels included:

- General chemistry (i.e., conductivity and pH)
- Indicator bacteria (i.e., total coliforms, fecal coliforms, and *enterococci*)
- Nutrients (i.e., ammonia, orthophosphate, and nitrate)
- Turbidity

Concentrations of pesticides (Diazinon and Chlorpyrifos) and metals (dissolved cadmium, dissolved copper, dissolved lead, and dissolved zinc) were below action levels in all samples analyzed.

One CSDM site is located within the Otay HU. The site was visited once per month. If flow or ponded water was observed, a paired sample was taken from the storm drain outfall and the receiving water. During 2008-2009, samples were not collected because neither flowing nor ponded water was observed from the monitoring site.

The MS4 Outfall Monitoring Program which occurred within the Otay HU included the Random Dry, Targeted Dry, and Random Wet programs. One site located within the Otay HU for the Random Dry Weather Outfall Monitoring Program exhibited ponded water from which a sample could be taken. Results of sampling indicated high concentrations of the following analytes at this location:

- Total Phosphorous
- Total Nitrogen,
- indicator bacteria

These results coincide with high priority BLTEA water quality rating for bacteria in the Otay HU.

A total of 12 sites were visited during the Targeted Dry Weather Outfall Monitoring Program during 2008-2009. Eleven of these sites were either flowing or ponded and were sampled for specific constituents. The elevated constituents included:

- Indicator bacteria
- Dissolved copper
- Nitrate and total nitrogen
- Total phosphorus

Elevated concentrations of one or more indicator bacteria were detected at all of the targeted sites sampled. Dissolved copper was detected throughout most samples for which it was analyzed, but all results were below water quality benchmark values. One site located in the upper Otay HU was analyzed for nitrate and total nitrogen. Results indicated a high concentration of total nitrogen. Nitrogen is listed on the 2006 SWRCB Section 303(d) list for the Lower Otay Reservoir. This result suggests that nitrogenous compounds in MS4 dry weather runoff from the targeted dry weather sites may have the potential to contribute to receiving water problems. Similarly, total phosphorus was analyzed at the same site and showcased a high concentration. Total phosphorus is not listed on the 2006 SWRCB Section 303(d) list for waterbodies within the Otay HU.

A comparison of instantaneous loads, based on constituent concentrations and flow at the time of the survey, suggests that loads were typically greatest where flow rates were highest. Sites located in the Coronado HA and Otay Valley HA had the highest flow rates and instantaneous loads for bacteria. MS4 runoff from these sites may have a greater potential for contributing to the receiving waters because of the greater instantaneous loads measured at the time of the surveys. The 2008-2009 targeted MS4 monitoring data allow for a relative comparison of instantaneous loads among sites in the Otay HU; however, the results should not yet be considered representative of dry weather MS4 runoff in the watershed. More meaningful spatial comparisons can be made as a more robust data set is developed in subsequent years of the MS4 Outfall Monitoring Program.

During the Random Wet Weather Outfall Monitoring Program, two sites were monitored. Both sites were located within the lower Otay Valley HA. One site was sampled exhibiting high concentrations of the following constituents:

- Total Phosphorus
- Total Nitrogen
- TSS
- Indicator bacteria

### **2.4.3 Pollutant Source Assessment (Otay HU)**

The trash assessment conducted during 2008-2009 as part of the Jurisdictional DWM Program was used to identify sources of trash in the Otay HU. A total of 84 sites were assessed for trash in the HU. A majority of assessment sites occurred within the lower portion of the WMA within the Coronado HA and Otay Valley HA. The Otay Valley HA had the greatest percentage and higher number of sites with Suboptimal, Marginal, or Poor sites. The potential activities resulting in the qualification of Poor rated sites were identified as littering and dumping. Sites rated as Poor were located in a highly urbanized area of the WMA consisting of residential and commercial land uses.

### **2.5 Prioritization of Water Quality Issues**

The San Diego Bay Copermittees presented a Baseline Watershed Evaluation (BWE) assessment in the 2008 San Diego Bay WURMP Document. The BWE process utilized Baseline Long-Term Evaluation Assessment (BLTEA) water quality ratings<sup>2</sup>, 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. Table 2-3 lists the high priority water quality problems as identified in Section 3 of the San Diego Bay WURMP Document.

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<sup>2</sup> WESTON (Weston Solutions, Inc.), MOE (Mikhail Ogawa Engineering), and LWA (Larry Walker Associates). 2005. *Baseline Long-Term Effectiveness Assessment*. Prepared for the San Diego County Copermittees. August 2005.

Table 2-3. San Diego Bay WMA High Priority water Quality Problems.

HA with High Prioritization	Pollutant Category
<b>Pueblo San Diego HU</b>	
<b>908.1</b>	Bacteria
	Gross Pollutants
	Metals
	Oil and Grease
	Pesticides
<b>908.2</b>	Bacteria
	Metals
	Sediment
	Trash
	Pesticides
<b>908.3</b>	Bacteria
	Sediment
	Trash
<b>Sweetwater HU</b>	
<b>909.1</b>	Bacteria
<b>909.2</b>	Pesticides
<b>Otay HU</b>	
<b>910.1</b>	Bacteria
	Gross Pollutants
<b>910.2</b>	Bacteria

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. Table 2-4 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 previous annual high frequency of occurrence COC rankings. Annual assessments of water quality allow the San Diego Bay Copermittees to track improvements associated with watershed activities or determine increasing trends of pollutants which require specific management actions. The 2008-2009 annual assessment of COCs is presented in this section for comparison purposes to the San Diego WMAs high priority water quality problems.

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

The constituents of concern with frequency of occurrence rankings identified during 2008-2009 are presented in Table 2-5. The 2008-2009 pattern of high frequency (three diamond) COCs in Pueblo San Diego HU are generally similar to previous years and correspond to the high priority water quality problems. Receiving water quality within Pueblo San Diego was assessed in Chollas Creek (908.2) which only flows during storm events. Observed flow during ambient conditions within the creek may be indicative of urban activities. Although there are many new monitoring programs to assess the contribution of urban runoff to receiving water quality

problems, such as the MS4 Outfall Monitoring Program, a cause-and-effect relationship may not be appropriate until further data has been collected and assessed.

Elevated concentrations of total nitrogen, total phosphorus, and *enterococci* identified within MS4 effluent may have an impact on receiving water quality. Total nitrogen and total phosphorus have been recognized within surface runoff emanating from residential and agricultural land uses as well as groundwater. Analysis of dissolved metals such as copper and zinc which are greatly associated with aerial deposition caused by transportation and industrial land uses indicate buildup during ambient conditions and then wash off during storm events. Bifenthrin, a synthetic pyrethroid, has been identified as the causative agent of toxicity within Chollas Creek. This is the first year that Bifenthrin has been identified as a high frequency of occurrence COC. Submarginal and Poor designations for trash observed during DWM trash assessments were primarily located within the San Diego Mesa 908.2 HA corresponding to the high priority water quality problems for this HA.

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Table 2-4. 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	Bacterial Pathogens	Benthic Alterations	Toxicity
<b>San Diego Bay WMA</b>	<b>100%</b>	<b>D</b>	<b>B</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>B</b>	<b>C</b>	<b>B</b>
Point Loma HA (908.10)	2%	A	D	D	B	C	B	D	D	A	A	A
San Diego Mesa HA (908.20)	9%	A	D	A	D	A	A	C	B	A	A	A
National City HA (908.30)	2%	C	D	D	C	B	C	B	C	A	A	A
Lower Sweetwater HA (909.10)	11%	D	A	D	D	C	B	D	D	A	A	B
Middle Sweetwater HA (909.20)	19%	D	B	D	D	C	A	D	D	C	B	B
Upper Sweetwater HA (909.30)	22%	D	B	D	D	C	C	D	C	C	B	B
Coronado HA (910.10)	2%	D	D	D	D	C	D	D	B	A	D	D
Otay Valley HA (910.20)	10%	D	D	D	D	C	D	C	C	A	D	D
Dulzura HA (910.30)	22%	D	B	D	D	C	D	D	D	D	D	C
<b>2006–2009 High Frequency of Occurrence COCs (from Integrated WMA Assessment)</b>												
<b>2006–2007 Monitoring Season Pueblo San Diego HU High<sup>1</sup> Frequency of Occurrence Ratings and COCs</b>	Wet Weather	◆◆◆ Copper Lead Zinc				◆◆◆ TSS Turbidity				◆◆◆ Total coliform Fecal coliform Enterococci	Very Poor IBI	No
<b>2007–2008 Monitoring Season Pueblo San Diego HU High<sup>1</sup> Frequency of Occurrence Ratings and COCs</b>	Ambient Weather	◆◆◆ Copper	◆◆◆ TDS					◆◆◆ TN TP			Very Poor IBI	No
	Wet Weather					◆◆◆ TSS Turbidity			◆◆◆ Total coliform Fecal coliform Enterococci		Yes	
<b>2008–2009 Monitoring Season Pueblo San Diego HU High<sup>1</sup> Frequency of Occurrence Ratings and COCs</b>	Wet Weather					◆◆◆ TSS Turbidity			◆◆◆ Total coliform Fecal coliform Enterococci	Very Poor IBI	Yes	
<b>2007–2008 Monitoring Season Sweetwater HU High<sup>1</sup> Frequency of Occurrence Ratings and COCs</b>	Wet Weather								◆◆◆ Fecal coliform	Very Poor IBI	No	
<b>2008–2009 Monitoring Season Sweetwater HU High<sup>1</sup> Frequency of Occurrence Ratings and COCs</b>	Wet Weather								◆◆◆ Fecal coliform Enterococci	Very Poor IBI	No	

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

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

Source Figure presented in the San Diego County Municipal Copermittees 2008-2009 Urban Runoff Monitoring Report. Prepared by WESTON Solutions, Inc. January 2010.

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Table 2-5. Pueblo San Diego HU Frequency of Occurrence Constituents of Concern.

Assessment	Program	Frequency of Occurrence	Persistent Toxicity Observed	Evidence of Benthic Impairment
Ambient Receiving Water	Historical Data at MLS Only <sup>2</sup>	TDS, Turbidity, BOD, COD, MBAS, Total nitrogen, Total phosphorus, Total coliform, Fecal coliform, <i>Enterococci</i> , Total selenium, Dissolved copper	*	Yes
Ambient Urban Runoff	Jurisdictional Dry Weather Monitoring	Conductivity, Turbidity, Orthophosphate, Total coliform, Fecal coliform, <i>Enterococci</i>	NA	
	MS4 Random Dry and Targeted Dry Monitoring <sup>2</sup>	Total nitrogen, Total phosphorus, Fecal coliform, <i>Enterococci</i>	NA	
Wet Weather Receiving Water <sup>1</sup>	MLS and Bioassessment Monitoring	◆◆◆-TSS, Turbidity, Total coliform, Fecal coliform, <i>Enterococci</i> ◆◆-Dissolved copper ◆-BOD, COD, Dissolved zinc	Yes ( <i>Hyalella azteca</i> )	
Wet Weather Urban Runoff	MS4 Random Wet and Targeted Wet Monitoring <sup>2</sup>	Total phosphorus, Total nitrogen, Fecal coliform	NA	

\*Ambient sampling as part of normal permit was not monitored due to Bight 2008 participation.

NA = Not assessed, Not Applicable, or Not Analyzed.

<sup>1</sup>Frequency of occurrence ratings are only applicable to wet weather receiving water data. A minimum of 3 years of data is needed for other elements of the program to assess frequency of occurrence.

<sup>2</sup>Concentration was compared to receiving water benchmarks for comparative purposes only.

Source Adapted from a table presented in the San Diego County Municipal Copermittees 2008-2009 Urban Runoff Monitoring Report. Prepared by WESTON Solutions, Inc. January 2010.

### 2.5.2 Sweetwater HU

The constituents of concern with frequency of occurrence rankings identified during 2008-2009 for the Sweetwater HU are presented in Table 2-6. As during previous years, indicator bacteria remains as the high frequency COC although total coliform was downgraded to a low frequency of occurrence during 2008-2009. These results are consistent with the BLTEA priority ratings for bacteria and benthic alterations, but may not be supportive of the A rating and high priority water quality ranking for pesticides in the Middle Sweetwater HA. While organophosphate pesticides including Chlorpyrifos, Malathion, and Diazinon have not been detected at the Sweetwater MLS since 2003, Malathion and Diazinon were detected in receiving water samples conducted by the County of San Diego (Activity Summary Sheet SDB-057). However, results were below the Basin Plan WQO.

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Table 2-6. Sweetwater HU Frequency of Occurrence Constituents of Concern.

Assessment	Program	Frequency of Occurrence	Persistent Toxicity Observed	Evidence of Benthic Impairment
Ambient Receiving Water	SMC and Bioassessment Monitoring <sup>2</sup>	Chloride, Total nitrogen, Total phosphorus	*	Yes
Ambient Urban Runoff Areas	Jurisdictional Dry Weather Monitoring	pH, Conductivity, Nitrate as N, Total coliform, Fecal coliform, <i>Enterococci</i>	NA	
	MS4 Random Dry and Targeted Dry Monitoring <sup>2</sup>	TDS, Total nitrogen, Total phosphorus, Fecal coliform, <i>Enterococci</i>	NA	
Wet Weather Receiving Water <sup>1</sup>	MLS and Bioassessment Monitoring	◆◆◆-Fecal coliform, <i>Enterococci</i> ◆◆-TDS ◆-Total coliform, Diazinon	No	
Wet Weather Urban Runoff Areas	MS4 Random Wet and Targeted Wet Monitoring <sup>2</sup>	Total phosphorus, Total nitrogen, Fecal coliform	NA	

\*Ambient sampling as part of normal permit was not monitored due to Bight 2008 participation.

NA = Not assessed, Not Applicable, or Not Analyzed.

<sup>1</sup>Frequency of occurrence ratings are only applicable to wet weather receiving water data. A minimum of 3 years of data is needed for other elements of the program to assess frequency of occurrence.

<sup>2</sup>Concentration was compared to receiving water benchmarks for comparative purposes only.

Source Adapted from a figure presented in the San Diego County Municipal Copermittees 2008-2009 Urban Runoff Monitoring Report. Prepared by WESTON Solutions, Inc. January 2010.

### 2.5.3 Otay HU

The Otay HU was not assessed for high frequency of occurrence COCs during 2008-2009 nor during previous reporting periods due to a lack of data collected from receiving waters. Post-storm event sediment sampling was conducted within Otay HU. Pyrethroids were not present in the sediment at concentrations that could have caused toxicity to benthic infaunal organisms. Elevated concentrations of indicator bacteria were detected within MS4 during urban runoff monitoring from various locations in the Coronado HA and Otay Valley HA. This result supports the BLTEA high priority (A) rating for bacteria the two HAs received. Receiving water quality monitoring conducted by the County of San Diego (Activity Summary Sheet SDB-057), located upstream of the Lower Otay Reservoir, did not showcase elevated concentrations of indicator bacteria during ambient or wet weather conditions. A Temporary Watershed Assessment Station will be monitored within Otay River during FY 2009-2010 and is expected to contribute to the understanding of receiving water quality within the watershed.

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## **Section 3: Implementation of Watershed 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 Appendix D of this Annual Report. The format of the activity summary template utilized by the San Diego Bay Copermittees is presented in the 2008 San Diego Bay WURMP Document.

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

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 within its jurisdiction, and has selected watershed water quality activities for implementation that are appropriate for its relative contribution to the watershed's high priority water quality problems.

Table 3-1 presents the water quality activities implemented in FY 2009. The progress of each activity has been described in activity summary sheets, located in Appendix D-1. The Copermittees have identified what was accomplished during the reporting period for these activities and how the activity addresses high priority water quality problems in particular HAs. During this reporting period, the San Diego Bay Copermittees implemented six trash and debris related water quality activities focused on reducing the amount of trash and debris entering the MS4. Six enhanced inspection activities were implemented to abate sources of high priority water quality problems associated with construction activities, large special events, or automotive facilities. In addition, Copermittees implemented four other water quality activities to either abate sources or reduce loading of high priority pollutants.

One water quality activity, the Trash Containment Boom Agreement with the US Navy (SDB-006) was completed during this reporting period. Copermittees identified as Named Dischargers in the Chollas Creek Dissolved Metals TMDL implemented a number of watershed activities which also address the TMDL. Those watershed activities listed in the TMDL Implementation Plan will be identified in Table 3-1 and will be discussed further in their respective activity summary sheets. Results and updates on the water quality activities implemented by all TMDL Named Dischargers during this reporting period are located in Appendix E.

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. With this in mind, 12 monitoring and source identification activities were implemented during this reporting period. One monitoring activity, Water Quality

Monitoring at Additional Mass Loading Stations (SDB-057) was completed 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.

The Copermittees have continued to collaborate on the reporting of four common jurisdictional water quality activities at a watershed level. These activities include: Pet Waste Bags, Storm Drain Litter Control Techniques, Enhanced Street Sweeping and Cleanup Events. This collaborative approach was utilized because these activities were identified as being beneficial in addressing high priority water quality problems and can be applied within different locations and at different scales of implementation as determined appropriate by each Copermittee. 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.

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Section 3 – Implementation of Watershed Activities**

Table 3-1. San Diego Bay WURMP Water Quality Activities in FY 2009.

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 (SDB-001)	X	X	X	X			X	X	X										
Storm Drain Litter Control Techniques Collaborative Watershed Activity (SDB-002)		X	X	X															
Enhanced Street Sweeping Collaborative Watershed Activities (SDB-003)*	X	X	X	X			X												
Collaborative Cleanup Events (SDB-004)		X	X	X			X												
Clean Community Program (SDB-005)			X																
Trash Containment Boom Cleaning Agreement with US Navy (SDB-006)	X	X	X																
Family Stream Team Initiative Partnership (SDB-051)*	X	X																	
<b>Enhanced Inspection Activities</b>																			
Additional Dry Season Construction Inspections (SDB-007)			X	X															
San Diego Bay Watershed Targeted Facility Inspections – Automotive (SDB-008)*		X																	
Enhanced Construction Oversight (SDB-009)	X																		
La Mesa Business Inspection Supplemental Watershed Questionnaire (SDB-010)*			X	X															
Large Sp. Events (Education, Inspections, and Cleanup) (SDB-047)							X												
Outdoor Special Event Oversight (SDB-048)		X																	
<b>Targeted Special Studies</b>																			
Municipal Rain Barrel Installation and Downspout Disconnects (SDB-012)*		X																	
Dalbergia "Green Mall" Infiltration Retrofit (SDB-013)*		X																	
Southcrest Park Green Lot Infiltration Project (SDB-014)*		X																	
Memorial Park "Green Lot" Infiltration Retrofit Activity (SDB-015)*		X																	

**San Diego Bay Watershed Urban Runoff Management Program 2008-2009 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
43 <sup>rd</sup> and Logan Biofiltration Project (SDB-037)*	X										•							•	
Maple Canyon Water Quality Improvement (SDB-049)*	X										•							•	
Chollas Creek Runoff Reduction and Groundwater Recharge Project (SDB-050)*	X										•							•	
<b>Other Water Quality Activities</b>																			
Update Recycling and Solid Waste Ordinance (SDB-035)				X							•								•
City of San Diego Strategic Plan Implementation (SDB-038)	X	X		X							•	•	•	•	•	•	•	•	•
Land Acquisitions – San Diego Bay Watershed (SDB-046)				X	X						•	•	•	•	•	•	•	•	•
Palm Avenue Stormwater Diverter (SDB-052)							X				•		•	•	•	•	•	•	•
<b>ADDITIONAL MONITORING AND SOURCE IDENTIFICATION ACTIVITIES</b>																			
Enhanced Dry Weather Monitoring Program (SDB-020)	X										•	•	•	•	•	•	•	•	•
Coordinated Dry Weather Monitoring Programs (SDB-021)	X										•	•	•	•	•	•	•	•	•
La Mesa Additional Water Quality Monitoring Program (SDB-022)*	X										•	•	•	•	•	•	•	•	•
BMP Effectiveness Monitoring Program (SDB-023)	X										•	•	•	•	•	•	•	•	•
Dry Weather Aerial Deposition Study – Phase II (SDB-024b)*	X										•	•	•	•	•	•	•	•	•
Dry Weather Aerial Deposition Study – Phase III (SDB-024c)*	X										•	•	•	•	•	•	•	•	•
Regional Harbor Monitoring Program (SDB-025)	X	X	X	X							•	•	•	•	•	•	•	•	•
Chollas Creek Design Storm Study and Sediment and Bacteria Relationship Source Study (SDB-026)		X									•		•						
Chollas Creek Beneficial Use Designation Attainability Study and Mouth of Chollas Creek Bacteria Source ID Study (SDB-027)*	X										•								
Shelter Island Yacht Basin Urban Runoff Monitoring Study (SDB-053)	X												•						
Switzer Creek Pesticide Source Monitoring Study (SDB-054)	X																	•	
Water Quality Monitoring at Additional Mass Loading Stations (SDB-057)				X	X	X					•	•	•	•	•	•	•	•	•

\* Indicates the watershed activities also listed in the Chollas Creek Dissolved Metals TMDL Implementation Plan.

### **3.2 Watershed Education Activities**

The San Diego Bay Copermittees recognize the value of educational programs as an essential element in ensuring future watershed protection efforts. The main focus of the San Diego Bay watershed education program is to make the public aware of the sources of water pollution in order to encourage positive behavioral change. Eleven watershed education activities were implemented in the San Diego Bay WMA during this reporting period (Table 3-2). Activity summary sheets for these activities are located in Appendix D-2. Four education activities were completed during this reporting period (SDB-030, SDB-031, SDB-043, and SDB-044). In addition to these identified educational activities, the Copermittees have continued to participate in other educational activities as part of JURMPs, RURMP or other programs. Section 3.2.1 provides a watershed-wide tabulation of all education activities the Copermittees implemented during the FY 2009 reporting year. This information will be utilized to obtain a comprehensive evaluation of education efforts occurring within the San Diego Bay WMA and aid in the development and/or modification of future watershed education activities.

**San Diego Bay Watershed Urban Runoff Management Program 2008-2009 Annual Report  
Section 3 – Implementation of Watershed Activities**

Table 3-2. Implemented San Diego Bay WURMP Education Activities in FY 2009.

	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	
San Diego Bay Watershed																					
Storm Drain Stenciling (SDB-028)	X	X	X	X								X	X	X							
Public Service Announcements: Karma/Karma Second Chance (SDB-029)																					
Outdoor Billboards/Transit Shelters (SDB-030)	X	X	X	X								X	X	X							
Mobile Advertising (SDB-031)	X	X	X	X								X	X	X							
Community Based Social Marketing Outreach Pilot Project—Chollas Creek Community SDB-032)	X	X	X	X								X	X	X							
Provide Homeowner's Association Education About Pet Waste Disposal (SDB-039)				X								X	X	X							
Storm Water Education Booth at Annual Pet Festival & Doggy Dash (SDB-040)				X								X	X	X							
Fats, Oils, and Grease (FOG) Program (SDB-041)				X								X	X	X							
La Mesa Park Kiosk (SDB-042)		X																			
LID and Watershed Planning Education for Community Planning and Sponsor Groups (SDB-043)				X	X	X						X	X	X							
ILACSD Elementary School Watershed Presentations (SDB-044)	X	X		X			X					X	X	X							

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

The San Diego Bay Education Program is outlined in the San Diego Bay WURMP Document. The education 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 activities that address watershed concepts and watershed pollutants. These tasks also overlap several programs which are required for Municipal Permit compliance on jurisdictional, watershed, or regional levels.

Table 3-2 provides a summary of the education activities that the San Diego Bay Copermittees implemented in the FY 2009 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. 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 Watershed Public Presentations and Media**

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 four sub-headings as shown in Table 3-3 and described below. Further detail on these activities is provided in Appendix F.

Festivals/Community Events – These events are generally hosted by local community groups or jurisdictions; and provide an opportunity to host a booth and to share educational materials. Community events, such as the San Diego County Fair, provide another venue for public outreach and education. The San Diego Bay Copermittees were involved in 55 different events this reporting period, including the Heritage Day Festival and Parade in the City of San Diego, the Intergenerational Games event in the City of La Mesa, the EnviroFair at the San Diego County Fair, the US Open Sand Castle Competition in the City of Imperial Beach, and the Go

Green and Clean Family Day in the City of Chula Vista. A summary of the number of persons reached is included in Table 3.4.

Presentations – This category includes presentations with visual aides given to community organizations or to school children, at their regular meeting or event. Staff from the jurisdictions in the San Diego Bay WMA made a number of presentations for groups 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. One highlight is the collaborative effort between five Copermittees and I Love A Clean San Diego (ILACSD) to provide information on high priority water quality problems and general storm water issues through presentations to elementary school children (Activity Summary Sheet SDB-044). Overall, the San Diego Bay Copermittees conducted 120 different presentations this reporting period which was estimated to reach approximately 27,959 persons.

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 Imperial Beach Eagle and Times, Coronado Currents, South Bay Star News, the La Mesa FOCUS, and the San Diego Union Tribune 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 Appendices D and F. The San Diego Bay Copermittees continue to explore opportunities at making coordinated efforts to garner print media coverage as an outreach and education mechanism. The San Diego Bay Copermittees distributed 39 different forms of watershed related print material during this reporting period.

Public Service Announcements (PSAs) – 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 FY 2009 reporting period represents the eighth 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 and estimates 4,471,328 impressions during the 2008-2009 reporting year. The City of San Diego produced and broadcasted the *Karma*, *Karma Second Chance*, and *Karma Tourist* PSAs (Activity Summary Sheet SDB-029) throughout the watershed during FY 2009. 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.

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. The San Diego Bay Copermittees conducted in 15 different Municipal Training Events during this reporting period. For more information on municipal staff training, please refer to each of the San Diego Bay Copermittee's individual JURMP.

Workshops – Several San Diego Bay Copermittees conducted educational workshops addressing storm water issues. These workshops targeted representative from businesses and the general public. Some of the topics included auto facility BMP implementation and water conservation. During the workshops, those in attendance were given opportunities to ask questions about the recommended BMPs and about more general storm water issues.



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**Section 3 – Implementation of Watershed Activities**

Table 3-3. Summary of Education Activities for FY 2009.

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	Festivals/Community Events	55	J, W, R	Airport Authority, Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, Port of San Diego, San Diego, County of San Diego	x	x	x	x	x	x
		Presentations	120	J, W	Airport Authority, Imperial Beach, La Mesa, National City, Port of San Diego, County of San Diego	x	x	x	x	x	x
		Print Media	39	J, W	Airport Authority, Chula Vista, Coronado, Imperial Beach, La Mesa, National City, San Diego	x	x	x	x	x	x
		Public Service Announcements	4	W, R	All	x	x				
		Municipal Staff Training	15	J, W	Airport, Chula Vista, Imperial Beach	x	x	x	x	x	x
		Workshops	15	J, W	La Mesa, National City, Port of San Diego, County of San Diego	x	x	x	x	x	x

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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	
School Programs	K - 12 children	Field Trips	18	J, W	Airport Authority, Chula Vista, Coronado, Imperial Beach, Port of San Diego, County of San Diego	x	x		x			
		Project SWELL	*	W, R	Port of San Diego, Airport Authority, City of San Diego	x	x					
Integrated Pest Management	General Public, Residential, Commercial/Industrial, Municipal	IPM Seminars/Events	14	J, W, R	La Mesa, Port of San Diego, City of San Diego	x	x		x			
Project Clean Water Watershed Website	General Public	Website with information related to surface water quality issues, watersheds, and pollutants	N/A	W, R	All	x	x	x	x	x	x	x

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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
Partners in Clean Water	General Public	Cleanup Events	30	J, W	Airport Authority, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, Port of San Diego, San Diego, Chula Vista	x	x	x	x	x	x
		Citizen Monitoring/ Training	2	J, W	Port of San Diego	x	x	x	x	x	x
		Waste Collection Recycling Events	11	J, W, R	Airport Authority, Chula Vista, La Mesa, Port of San Diego	X	X	X	X	X	X
		Storm Water Stenciling Events	1	J, W	Chula Vista	X	X	X	X	X	X

\* Project Swell is reported as the number of students reached and is discussed further in Section 3.2.1.2.



### **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 3-3) shows the four main sub-categories used to describe the education and outreach efforts directed at school children during this reporting period.

Field Trips – The San Diego Bay Copermittees provided field trips to the Chula Vista Nature Center, Wildcoast Sea Turtle Education, the Maritime Museum, and others, as an effective hands-on means of increasing watershed and water quality awareness in their students. Attendance at these field trips was more than 11,600 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. In all, Project SWELL reached more than 40,000 school children in the SDUSD 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.

IPM Seminars and Events – These include 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. Events include the Green Port IPM Seminar and County Integrated IPM Training for Landscape Professionals. The San Diego Bay Copermittees participated in three different IPM Seminars/Events during this reporting period.

### **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 3-3 shows the four main sub-categories as listed below 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. These events usually involve trash removal from inland and coastal areas.

All the San Diego Bay Copermittees collectively sponsored the Creek to Bay Cleanup for the fifth 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. The San Diego Bay Copermittees participated in 30 Cleanup Events during this reporting period. A summary of the number of persons reached is included in Table 3-4. Additional information on watershed cleanup events is provided in Activity Summary Sheet SDB-004 in Appendix D-1.

Citizen Monitoring/Training – Citizen Monitoring Training and Citizen Monitoring events provide an opportunity for community members to learn how water quality testing is performed, as well as make a connection to the water bodies in their neighborhoods. The Port of San Diego sponsored two programs with Citizen Monitoring components during this reporting period. The Chollas Creek Family Stream Team Initiative Partnership (SDB-051) and the Zoological Society of San Diego's Stream Team Stewards program provided training to citizens within the Chollas Creek watershed (908.2 HA). Further details on these programs are provided in Appendices D-1 and E.

Storm Drain Stenciling Events – These events are an effective means for increasing watershed and water quality awareness in the community. The City of Chula Vista continued to participate in events during FY 2009 where inlets were affixed with storm water related placards or stenciled graphics (SDB-028). In addition to the 500 thermoplastic storm drain markers permanently affixed to storm drain inlets with the prohibitive "No Dumping – Drains to Bay" message during the last fiscal year, citizens stenciled 88 more storm drains during the Beautify Chula Vista Day event in October 2008. Notably, nearly all storm drain structures in the City are identified with stenciling, plastic markers, or permanent concrete stamping.

Waste Collection/Recycling Events – These include special organized events where citizens can properly dispose of their HHW or E-Waste. This does not include regular collection at HHW facilities. The San Diego Bay Copermittees participated in 11 Waste Collection/Recycling Events during this reporting period with a summary of persons reached included in Table 3-5.

### **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 3-4 provides a description of the possible levels of public participation, ranging from simple notifications to empowerment of full decision-making.

Table 3-4. Levels of Public Participation.

Public Participation Objectives				
INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
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 established 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 were assessed by understanding the numbers of stakeholders reached through each decision-making opportunity (where applicable), and by providing 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 F. 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 2009 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 to inform, consult, and involve Copermittees and other stakeholders on local watershed efforts. Appendix B presents a summary of the meetings held by the workgroup during FY 2009, including an outline of the principal agenda items.

### Workshops and Conferences

San Diego Bay Copermittees conducted educational workshops addressing storm water issues to inform and involve the public. These workshops targeted representatives 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. The San Diego Bay Copermittees conducted or participated in 15 different watershed related workshops and conferences during this reporting period.

### Presentations

The San Diego Bay Copermittees conducted a variety of informational 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. The total number of persons attending presentations is estimated at 27,959.

### Community Events

During this reporting period, the San Diego Bay Copermittees participated in 55 watershed related community events. Collectively, the community events met all five public participation objectives presented in Table 3-4 and 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. As a result, the cleanup events and waste collection events were effective in achieving all of the public participation objectives.

Though the San Diego Bay Copermittees have identified trash as a constituent of concern for the Pueblo HU, the Copermittees continued 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 provided with educational material regarding watershed concepts and have the opportunity to discuss storm water issues with city staff and knowledgeable volunteers. Additional information on watershed cleanup events is provided in Activity Summary Sheet SDB-004 in Appendix D-1.

Notably, the Chollas Creek Stream Team Initiative Partnership (SDB-051) addressed illegal dumping and non-point source trash accumulation within Chollas Creek (908.2 HA) by organizing refuse collection events and community education and outreach efforts. The Initiative successfully implemented public participation elements to inform, involve and empower citizens to participate in proper refuse disposal in order to reduce illegal dumping and trash within the Chollas Creek community.

Free collection of household hazardous waste (HHW), electronic, and universal waste has occurred during FY 2009. 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 3-5 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 Appendix F.

Table 3-5. Summary of Activities.

Type of Activity	Number of Events	Number of People Reached*
Workshops/Conferences	15	252
Presentations	120	27,959
Community Events	55	344,227
Cleanup Events	30	7,646
Waste Collection Events	11	4,307

\* 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 successfully provides a means of public participation by informing and involving the public on San Diego Bay water quality issues. Each of the three HUs 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, 6,266 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 1,559 hits, Sweetwater Watershed received 1,924 hits, and the Otay Watershed link received 1,886 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. By consulting and collaborating with various stakeholders, Copermittees' efforts have empowered the public to be more involved in addressing water quality issues. 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 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, the County of San Diego and Imperial Beach. The Plan was approved by the City of San Diego in FY 2009 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 (through its consultant team) has prepared most of the technical background information that is necessary to complete the 404(b)(1) process of the Clean Water Act, and the SAMP document is scheduled to be prepared in early 2010. In addition, the Army Corps has received additional funding and has hired URS to prepare the Environmental Impact Statement (EIS). The EIS will be underway shortly after the SAMP document is completed.

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

#### **3.5.1 New Activities**

The San Diego Bay Copermittees added new watershed activities to the San Diego Bay WURMP Strategic Plan during FY 2009. Copermittees incorporated 3 new educational activities (Activity Summary Sheets SDB-044, SDB-045, and SDB-055) and four new water quality activities (Activity Summary Sheets SDB-049, SDB-050, SDB-051 and SDB-052). Five new monitoring activities (Activity Summary Sheets SDB-024b, SDB-024c, SDB-053, SDB-054, and SDB-057) were also included. The activity summary sheets for these activities are presented in Appendix D-1 and D-2.

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

The San Diego Bay WURMP's Strategic Plan is assessed on an annual basis 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. The updated Implementation Plan Schedule of San Diego Bay WURMP is presented in Table 3-6 and is intended to supercede the previous version presented in the 2008 San Diego Bay WURMP Document. 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.

#### **3.5.3 Updates to TMDL Implementation Plan Activities**

Currently, there are three adopted TMDLs in the San Diego Bay WMA (Table 2-2): the Chollas Creek Diazinon TMDL, the Chollas Creek Dissolved Metals TMDL, and the SIYB Dissolved Copper TMDL. The named dischargers of the Chollas Creek Diazinon and Dissolved Metals TMDLs have developed an Implementation Plan defining the approach to planning, implementing, and assessing the effectiveness of best management practices (BMPs) with the goals of attaining the waste load allocations (WLAs) for dissolved metals and restoring the beneficial uses of the Chollas Creek Watershed. The named dischargers of the SIYB Dissolved Copper TMDL initiated the development of an Implementation Plan during this reporting period as well. An assessment of the efforts to address TMDL compliance during this reporting period is presented in Section 4.2 of this Annual Report.

#### **Chollas Creek Dissolved Metals TMDL Implementation Plan Activities**

The seven named dischargers, Cities of San Diego, La Mesa, Lemon Grove, County of San Diego, Port District, U.S. Navy, and Caltrans, developed an Implementation Plan which presents the strategy, framework, and activities for the first five years under the TMDL using a multi-

pollutant approach. The first five years, considered Phase I, involve the implementation a range of BMPs designed to address identified priority water quality problems from a range of community, structural, and watershed-level activities. Phase I also includes effectiveness assessments to measure the performance of specific BMPs to assess the long-term performance of the program, and to identify existing pollutant source or BMP design data gaps. The goal is to maximize the effectiveness of specific activities to guide the BMP priority rankings and implementation in subsequent phases with the ultimate goal of achieving TMDL compliance.

Though the Implementation Plan was submitted in October 2009 (outside of this reporting period) the dischargers implemented several activities as part of their comprehensive Storm Water Programs that will help in meeting TMDL compliance for both the Metals TMDL and the Diazinon TMDL. The dischargers also have a number of activities planned over the next few years. Specific activities that the dischargers are implementing are included in tabular format in Appendix E. Fifty-one activities, including water quality, education, and ongoing agency-wide activities, were in implementation in FY 2009. Fifty-two are planned to be implemented or continue into FY 2010, including two Municipal Code review and modification projects. Additionally, there are four collaborative special monitoring studies planned for FY 2010. Activities are further described in the tables included in Appendix E.

While activities implemented to address the Chollas Creek Diazinon TMDL are referenced in the discussion above, the dischargers that are responsible under the Diazinon TMDL must report on specific implementation elements. These updates are included in Appendix C, as part of the annual response to monitoring report. However, specific activities referenced as part of the implementation elements discussion in Appendix C are also included in the Metals TMDL dischargers' tables in Appendix E, demonstrating the multi-pollutant approach to the Metals TMDL.

#### SIYB Dissolved Copper TMDL Implementation Plan Activities

The named parties, the Port of San Diego, the City of San Diego, and all SIYB marinas and yacht clubs, and hull cleaners began the development of the TMDL Implementation Plan during this reporting period. The Implementation Plan incorporates a collaborative approach among the named parties to planning, implementing, and assessing BMPs to achieve reductions in copper loading into SIYB. The Implementation Plan will utilize a solutions-oriented strategy of establishing BMPs that help realize the objective of reducing copper loading into the basin in order to preserve and restore the beneficial uses, while simultaneously achieving compliance with the SIYB interim and final dissolved copper loading thresholds. Loading reductions will be achieved through conversion of vessels to non-copper-based paints, reductions of inputs via hull cleaning, and control of upstream inputs. Therefore, the named parties identified BMPs and other activities that can be best implemented within their given facility/operations in order to collectively achieve compliance with TMDL loading targets for the entire basin.

Named Parties are developing individual work plans, identifying BMPs to be implemented to achieve loading reductions, as well as implementation schedules, assessment mechanisms, and effectiveness targets. In the individual BMP Implementation Plans, the named parties have the option of choosing voluntary measures, such as education, outreach, green boater certification programs, and incentives, especially in early stages of the TMDL, while in later stages the inclusion of mandatory measures, such as Port-issued policies, and Regional Board-issued regulations and orders, may be required to meet final loading reduction targets. The decision to incorporate more prescriptive BMPs will be based on individual and collaborative effectiveness assessments, including the results of tracking and monitoring programs.





**San Diego Bay Watershed Urban Runoff Management Program 2008-2009 Annual Report  
Section 3 – Implementation of Watershed Activities**

Table 3-6. Updated San Diego Bay Watershed Activity Implementation Schedule.

Activity	Hydrologic Area								Polluta					
	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
<b>San Diego Bay Watershed</b>														
Palm Avenue Stormwater Diverter (SDB-052)							X							
Stormwater Quality Master Plans for Special Drainage Fee Areas (SDB-056)		X			X	X								
<b>ADDITIONAL MONITORING AND SOURCE IDENTIFICATION ACTIVITIES</b>														
Enhanced Dry Weather Monitoring Program (SDB-020)		X												
Coordinated Dry Weather Monitoring Programs (SDB-021)		X												
La Mesa Additional Water Quality Monitoring Program (SDB-022)		X												
BMP Effectiveness Monitoring Program (SDB-023)		X												
Dry Weather Aerial Deposition Study – Phase I (SDB-024a)		X												
Dry Weather Aerial Deposition Study – Phase II (SDB-024b)		X												
Dry Weather Aerial Deposition Study – Phase III (SDB-024c)		X												
Regional Harbor Monitoring Program (SDB-025)		X	X	X			X							
Chollas Creek Design Storm Study and Sediment and Bacteria Relationship Source Study (SDB-026)		X												
Chollas Creek Beneficial Use Designation Attainability Study and Mouth of Chollas Creek Bacteria Source ID Study (SDB-027)		X												
Shelter Island TMDL Urban Runoff Monitoring Study (SDB-053)	X													
Switzer Creek Pesticide Source Monitoring Study (SDB-054)		X												
Water Quality Monitoring at Additional Mass Loading Stations (SDB-057)					X	X								
<b>EDUCATIONAL ACTIVITIES</b>														
Storm Drain Stenciling (SDB-028)				X								X	X	
Public Service Announcements: Karma/Karma Second Chance (SDB-029)	X	X	X	X								X	X	
Outdoor Transit Shelters and Billboards Advertisements (SDB-030)	X	X	X	X								X	X	
Mobile Advertising (SDB-031)	X	X	X	X								X	X	
Community Based Social Marketing Outreach Pilot Project—Chollas Creek Community SDB-032)	X	X	X	X								X	X	
City of Coronado Fire Department Open House (SDB-033)								X						
Provide Homeowner's Association Education About Pet Waste Disposal (SDB-039)				X								X	X	
Storm Water Education Booth at Annual Pet Festival & Doggy Dash (SDB-040)				X								X	X	
Fats, Oils, and Grease (FOG) Program (SDB-041)				X								X	X	
La Mesa Park Kiosk (SDB-042)		X												

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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 and describes the results of this assessment.

Effective implementation of the WURMP is dependent on the establishment of comprehensive and program-wide goals as well as objectives and tasks. The 2008 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. For this annual San Diego Bay WURMP assessment, the San Diego Bay Copermittees addressed the management questions to the best extent possible. The assessment verified that the Copermittees have achieved compliance with the Permit and are continuing to work towards attaining the long-term goal of decreasing the sources and reducing the discharge of pollutants from the MS4. The following sections summarize WURMP activities and evaluate progress of the San Diego Bay WURMP toward meeting Target Outcome Levels One through Six.

#### **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 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. By thoroughly evaluating the activities, their relevance to each other and to the high priority water quality problems and their sources, the Copermittees were able to assess if activities are effectively targeting high priority pollutants and/or sources, or if modifications are necessary. The Copermittees not only evaluated the effectiveness of each individual activity implemented during the reporting period, but also evaluated how the activities contributed to the success of the overall program effectiveness.

The process provides the San Diego Bay Copermittees with a valuable resource and a 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 watershed workgroups and jurisdictions improve and enhance their programs. The collaborative and group assessment of the activities also encourages Targeted Special Studies and comprehensive thinking when planning future cooperative activities.

The San Diego Bay Copermittees have been successful in implementing watershed water quality and education activities that resulted in increased awareness and change in behavior, reduced discharge loads, abatement of potential sources, and 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 its implemented activities and determined if the effectiveness of the activities have been maximized when possible. Table 4-1 presents each individual watershed activity's effectiveness assessment mechanisms and identifies whether or not the activities were effective and contributed to the success of the overall program. 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 changes in awareness/behavior and/or load reduction/source abatement. Copermittees were able to show their activities were effectively addressing high priority water quality problems by providing assessment data for 12 water quality activities.

It should be noted there were watershed activities implemented that did not have all of the listed assessment mechanisms completed during this reporting period, and effectiveness has not yet been determined. Though considerable resources may be directed to these activities, effectiveness assessments are not yet available for a number of reasons, such as delays in planning/development of an activity or since the activity is still in progress. For example, the Family Stream Team Initiative (SDB-051) held refuse collection events during this reporting year which resulted in load reductions of trash, but the activity is on-going and is scheduled for completion in FY 2009-2010. In addition, assessment was not completed during this reporting period for the Targeted Special Studies (SDB-012, SDB-013, SDB-014, SDB-015, SDB-037, SDB-049, and SDB-050) because the activities were either in planning/design stage or the assessment may be in progress. Please refer to the activity summary sheets in Appendix D-1 for detailed analysis of progress to date for these activities.

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Section 4 – Effectiveness Assessment**

**Table 4-1. Watershed Activity Assessment.**

<b>Number</b>	<b>Activity Name</b>	<b>Outcome Levels</b>	<b>Assessment Mechanisms</b>	<b>Completed</b>	<b>Effectiveness Assessment Information</b>
<b>Trash and Debris Related Activities</b>					
<b>SDB-001</b>	Pet Waste Bag Programs	Level 3 and 4	Quantity of bags removed or new dispensers added	Yes	Estimated quantity of bags used (approximately 518,327 bags) while the Airport Authority estimated 172 lbs of waste or approximately $1.8 \times 10^{12}$ fecal coliform bacteria pollutant load reduction. The County of San Diego estimated a removal of approximately 10,568 lbs. of waste
<b>SDB-003</b>	Enhanced Street Sweeping	Level 4	Amount of debris collected and curb miles covered	Yes	1,353 tons of debris, 25,692 curb miles, 2,554 broom miles. Special study to determine optimal frequency is ongoing.
<b>SDB-004</b>	Cleanup Activities	Level 3 and 4	Amount of trash and number of people	Yes	Recorded amount of trash (530 tons) and number of people (Approximately 5,696 participants).
<b>SDB-005</b>	Clean Community Program	Level 3 and 4	Amount of trash collected, number of volunteers, contest participation	Yes	118 volunteers removed 4,598 pounds of trash and debris from waterway banks. 43 third grade classrooms participated in a storm water art contest for the 2010 Storm Water Calendar and 5,740 calendars (2009) were distributed.
<b>SDB-006</b>	Trash Containment Boom Cleaning	Level 4	Inspections, quantification, monitoring, tabulation, reporting	Yes	9 tons of trash and debris removed
<b>SDB-051</b>	Family Stream Team Initiative Partnership	Level 4	Amount of trash and non-native vegetation collected, number of flyers distributed, observable changes in debris within creek, number of participants involved	No	Activity is still in progress. Effectiveness assessment has not been completed. To date, approximately 90 tons of debris was collected during 5 events. Approximately 12 tons of non-native vegetation removed. 1,750 flyers distributed.

**San Diego Bay Watershed Urban Runoff Management Program 2008-2009 Annual Report**  
**Section 4 – Effectiveness Assessment**

Number	Activity Name	Outcome Levels	Assessment Mechanisms	Completed	Effectiveness Assessment Information
Enhanced Inspection Activities					
SDB-007	Additional Dry Season Construction Inspections	Level 3	Implementation rates, increase inspection frequencies	Yes	Completed 19 routine inspections. Helped contractors stay vigilant about implementing BMPs, especially near the end of dry season. BMP deficiencies noted during the dry season inspections were resolved during the first inspection of the wet season.
SDB-008	San Diego Bay Watershed Targeted Facility Inspections -Automotive Facilities	Level 3 and 4	Achieve greater BMP implementation rates from optimized inspection rates. Inspections, quantification, monitoring, tabulation, reporting	Yes	191 inspections at 21 locations immediate corrective actions/source abatement were taken.
SDB-009	Enhanced Construction Oversight	Level 3 and 4	Track number of meetings attended, the number of site inspections conducted in excess of the minimum number required by the Municipal Permit, number of sediment source control BMP issues identified during inspections, estimate the annual sediment pollutant load abated	Yes	Attended 181 meetings, performed 96 more inspections than required by the permit, approximately 1 out of 4 inspections identified sediment source control BMP issues, was able to estimate annual sediment pollutant load reduction as approximately 22 tons.
SDB-010	Business Supplemental Watershed Questionnaire	Level 2	Compare how the level of storm water awareness and BMP implementation of business owner/operators changes overtime with increased education and outreach.	Yes	14% of respondents in 2008/2009 did not know where storm water runoff goes, and 4 percent thought that the water was directed to a treatment facility. Inspectors provided verbal explanations and education about storm water issues and BMPs to individuals during inspections.
SDB-047	Large Special Events Education, Inspections, and Cleanup	Level 3 and 4	Amount of trash and education efforts	Yes	Debris was collected and quantified. BMP information provided to street vendors and follow up inspections verified BMP implementation.

**San Diego Bay Watershed Urban Runoff Management Program 2008-2009 Annual Report**  
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Number	Activity Name	Outcome Levels	Assessment Mechanisms	Completed	Effectiveness Assessment Information
SDB-048	Outdoor Special Event Oversight	Levels 3 and 4	Track the number of outdoor special events, track the number of pre-event meetings attended, the number of pre- and post-event site inspections conducted, and the number of trash source control BMP issues identified during the inspections. estimate the annual trash pollutant load abated	Yes	1 outdoor special event, 1 pre event meeting was attended, 1 pre event inspections were conducted, 2 post event inspections were identified, 0 trash source control BMP issues were identified. No estimate of pollutant load could be completed. For this activity we are currently reaching level 3.
<b>Other Water Quality Activities</b>					
SDB-046	Land Acquisitions – San Diego Bay Watershed	Level 3 and 4	Tracking the number and total acreage of land acquisitions within the watershed on an annual basis	Yes	Acquired 3 properties (385.38 acres) which precludes development from occurring and allows land to retain its natural perviousness, avoiding entirely the introduction of pollutant-generating activities.
SDB-052	Palm Ave Urban Runoff Diverter	Level 4 and 5	Weekly post construction bacterial monitoring and flow analysis	No	Efforts on measuring the effectiveness are currently under way. During the first 6 months of monitoring, 192,000 gallons of urban runoff was diverted into the sanitary sewer. Results from the weekly bacterial analysis also revealed elevated levels of bacteria in the diverted flows. Compared to AB411 monitoring action levels, 85% of the samples were in exceedance of <i>enterococcus</i> and 100% of the samples were in exceedance of total coli form bacteria.
<b>Watershed Education Activities</b>					
SDB-028	Storm Drain Stenciling	Level 2	Number of pedestrians who pass these stencils	Yes	Thousands of pedestrians pass these stencils on an annual basis
SDB-029	Public Service Announcements: Karma/Karma Second Chance	Level 2 and 3	Surveys, number of impressions	Yes	4,771,328 impressions. Survey indicated 44% change in knowledge or attitude. Survey also showed 29% of residents reported making a change in behavior as a result of seeing what runoff does to local waterways.
SDB-030	Outdoor Billboards/Transit Shelters	Level 2	Surveys, number of impressions	No	Activity demonstrated a lack of effectiveness of increased awareness of storm water issues.

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Number	Activity Name	Outcome Levels	Assessment Mechanisms	Completed	Effectiveness Assessment Information
SDB-031	Mobile Advertising	Level 2	Surveys, number of impressions	Yes	69,153 impressions. Survey indicated 44% change in knowledge or attitude, though survey also indicated that only 17% of the public reported being aware of storm water issues through Mobile Advertising. Therefore, it was determined that this activity is not effective enough to continue to implement.
SDB-039	Provide Homeowner's Association Education about Pet Waste Disposal	Level 2	Number of homeowners and HOAs reached through education efforts	No	Assessment will be conducted in Year 5 of the Permit Cycle FY08-09 – wrote article for HOA magazine with the circulation of 20,000
SDB-040	Storm Water Education Booth at Annual Pet Festival and Doggy Dash	Level 3	Surveyed pet owners who pick up after their pets	Yes	89 surveys completed, 80% of pet owners use a plastic bag to pick up their pet's waste
SDB-041	Fats, Oils and Grease (FOG) Program	Level 1	Number of restaurants surveyed	No	Education assessment will be conducted in the FY09-10; 216 surveys completed
SDB-042	Park Kiosk	Level 2	Increased awareness of watershed problems and pollution prevention methods.	Yes	Kiosk was maintained and kept with up to date information. No other assessment data is available.
SDB-043	LID and Watershed Planning Education for Community Planning and Sponsor Groups	Level 2 and 3	Number of presentations conducted; number of participants; number and type of materials distributed	Yes	Seven surveys distributed to 128 participants; 22.86% increase in knowledge.
SDB-044	ILACSD Elementary School Watershed Presentations (SDB-044)	Level 2 and 3	Number of students, Pre-and post-tests	Yes	474 students, Pre- and post-test indicated an average of 14% change in knowledge or attitude.

#### **4.1.2 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 2008 San Diego Bay WURMP document. This evaluation revealed whether 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 potential 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 effective at 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 the previous reporting period, the Copermittees identified and implemented four collaborative water quality activities which occurred across multiple HAs, including Pet Waste Bags (SDB-001), Storm Drain Litter Control Techniques (SDB-002), Enhanced Street Sweeping (SDB-003), and Cleanups (SDB-004). The Copermittees continued the implementation of Pet Waste Bags (SDB-001), Enhanced Street Sweeping (SDB-003), and Cleanups (SDB-004) during FY 2009.

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. In particular, Copermittees addressed bacteria on a watershed scale by implementing activities targeting various pollutant sources in all HAs. 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 is being addressed through such activities as Enhanced Street Sweeping (SDB-003), Cleanup Events (SDB-004), and Family Stream Team Initiative (SDB-051). These activities directly address 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.

##### **4.1.2.1 Pueblo San Diego HU (908)**

The Pueblo San Diego Watershed is the smallest HU in San Diego County, encompassing approximately 60 square miles of predominantly urban landscape. The watershed drainage consists of a group of relatively small local creeks and pipe conveyances, many of which are

concrete-lined and drain directly into San Diego Bay. The creeks in the watershed are highly impacted by urban runoff, with two TMDLs adopted (Dissolved Metals and Diazinon) for Chollas Creek in particular.

#### **4.1.2.1.1 Point Loma HA (908.1)**

The high priority water quality problems in the Point Loma HA are Bacteria, Gross Pollutants, Metals, Oil and Grease, and Pesticides. Activities were implemented that effectively targeted a variety of sources of high priority pollutants. Potential pollutant sources in the Point Loma HA include those related to residential areas, streets and roadways, or commercial business, schools, and public facilities.

Copermittees implemented two water quality activities in the Point Loma HA during FY 2009 that effectively addressed high priority water quality problems. The Pet Waste Bag Collaborative Watershed Activity (SDB-001) targeted a specific source of bacteria within residential and park areas and is believed to be effective in abating this source. Enhanced Street Sweeping (SDB-003) in this HA was also implemented to address load reductions of gross pollutants, metals, and oil and grease into the MS4 from streets and roadways. A variety of other pollutants are known to be associated with sediment, such as bacteria, may also be reduced. Load reductions have been assessed through the quantification of the weight of debris collected during sweeping and/or the amount of area (curb miles) covered by street sweeping vehicles. Copermittees implemented three monitoring and source identification studies in this HA to supplement MS4 and CSDM monitoring in the HA. Copermittees implemented the RHMP, Coordinated Dry Weather Monitoring, and SIYB Urban Runoff Monitoring Study to evaluate receiving water quality and provide additional information on sources of high priority water quality problems.

An effective watershed education activity implemented at the watershed-level during FY 2009 that was applicable to this HA was the Public Service Announcements (SDB-029). Assessment surveys associated with the Public Service Announcements indicated a 44% change in knowledge watershed-wide, indicating the activity has a positive effective by increasing knowledge and changing behavior in the community, which will likely lessen the their impacts on water quality. While portions of this survey were conducted in this HA, enhanced assessment at the HA level was not completed.

#### **4.1.2.1.2 San Diego Mesa HA (908.2)**

The San Diego Mesa HA is a heavily urbanized watershed, and includes the Chollas Creek HSA (908.22). The high priority water quality problems in the San Diego Mesa HA are Bacteria, Metals, Sediment, Trash, and Pesticides. Prominent land uses which may contribute to high priority water quality problems in the HA include residential, streets and roadways, and commercial/industrial businesses. Other land uses in the HA include schools, parks, and public facilities. Copermittees have implemented a number of activities that target sources of high priority water quality problems in the HA during this reporting year. Many of these activities

have also been identified to be applicable in addressing the Chollas Creek Dissolved Metals and Diazinon TMDLs.

Copermittees implemented eight water quality activities in this HA that effectively addressed the high priority pollutants. Enhanced Inspection activities such as Targeted Automotive Inspections (SDB-008), Outdoor Special Event Oversight (SDB-048), and Enhanced Construction Oversight (SDB-009) have been identified as effective in abating the sources of high priority water quality problems in this HA. The activities identified specific sources of metals, trash, or sediment and ensured proper BMP implementation in order to effectively reduce sediment loading into the MS4 (Level Four Outcome). For example, there is evidence of reduced erosion and sediment capture on construction sites as a result of the BMPs, although this has not been quantified. Heightened awareness of proper BMP implementation increases the likelihood of BMP effectiveness, which in turn helps to abate the amount of pollutant loading to San Diego Bay. The Enhanced Street Sweeping Activity (SDB-003) may have beneficial effects by reducing the loading of pollutants such as sediment, metals, and trash that are discharged to MS4s. In addition, the Targeted Aggressive Street Sweeping Project (SDB-003) was implemented in this HA to determine the optimal street sweeping frequencies and sweeper machinery. Specifically, the pilot study is investigating the effectiveness of using vacuum-assisted street sweepers in place of conventional mechanical sweepers and increasing sweeping frequencies to reduce the accumulation of debris containing metals on streets and roadways.

The Copermittees implemented four load reduction/source abatement activities to address trash and debris related sources: Pet Waste Bag (SDB-001), Cleanups (SDB-004), Trash Containment Boom Cleaning (SDB-006) and Family Stream Team Initiative (SDB-051). The Pet Waste Bag Activity (SDB-001) was effective in targeting and reducing a source of bacteria within areas such as residential areas and parks. Cleanup events and similar trash related activities aided in the physical removal of a quantifiable amount of trash from the watershed. Because the accumulation of trash and debris may result in a number of negative impacts that contribute to increased contamination, such as elevated numbers of bacteria in the water, it may be assumed that these impairments may be indirectly reduced through the cleanups, though this has not been quantified.

A number of activities have been identified by Copermittees to address the Chollas Creek Dissolved Metals and Diazinon TMDLs, as discussed in Section 3.5.3 and Section 4.2. In the 908.22 HSA, Named Dischargers implemented 51 activities, including water quality, education, and ongoing agency-wide activities, in FY 2009 to address the identified high priority water quality problems. A comprehensive assessment of the activities identified in the TMDL Implementation Plan will be discussed in Section 4.2.1.

The Copermittees implemented education activities in this HA that were found to be effective in increasing awareness and knowledge. As discussed in Section 4.1.2.1.1, the Public Service Announcement (SDB-029) activity was also conducted in this HA. The ILACSD Elementary

School Presentations (SDB-044) provided watershed focused pollution prevention information to 5<sup>th</sup> and 6<sup>th</sup> grade elementary students at two elementary/middle schools and one high school in this HA during this reporting year. Assessment of the activity indicated an average increase of 14% change in knowledge and attitude as a result of the presentations.

As noted in Section 2.2, water quality data was collected primarily within the San Diego Mesa HA within the Chollas Creek HSA (908.22). Copermittees implemented a number of monitoring and source identification studies in this HU in addition to the regional Receiving Waters and Urban Runoff Monitoring Program, following management actions identified in the San Diego Bay WURMP Watershed Strategy. These activities are necessary to fill data gaps before implementation of a load reduction activity can occur or to identify the appropriate focus of resources. Copermittees successfully collected data from 9 urban runoff source identification activities within this HU. In addition, the RHMP will provide data useful in long trend analysis of receiving water condition, as discussed in Section 2. Data resulting from this monitoring will enable the Copermittees to make more informed decisions on the BMP implementation that targets high priority pollutants in the future.

#### **4.1.2.1.3 National City HA (908.3)**

Activities were implemented that effectively targeted a variety of sources of bacteria, sediment and trash from prominent land uses such as residential, streets and roadways, open space and parks, and commercial/industrial businesses. Copermittees implemented six effective water quality activities in the National City HA during FY 2009.

Copermittees implemented three load reduction/source abatement activities to address trash in this HA. Because trash and debris may result in a number of negative impacts that contribute to increased contamination, such as elevated numbers of bacteria in the water, it may be assumed that these activities also result in bacteria load reductions. The Copermittees also effectively addressed two different sources of sediment (construction and streets and roadways) during this reporting year. Copermittees participating in the Enhanced Street Sweeping Activity (SDB-003) increased the frequency of sweeping relative to JURMP requirements, effectively reducing the loading of sediment into the MS4. In addition, Additional Dry Season Construction Inspections (SDB-007) reduced sediment and trash runoff by promoting proper BMP implementation at construction sites during the dry season and helping construction sites prepare for the upcoming wet season. It was determined that most of these inspections helped contractors stay vigilant about implementing BMPs during the dry season and helpful toward the end of the dry season, when responsible parties are reminded of applicable wet season requirements.

Five education activities were implemented which effectively targeted a variety of audiences in this HA during this reporting year. As discussed in Section 4.1.2.1.1, the Public Service Announcement (SDB-029) activity was also conducted in this HA. The activity has a positive effect by increasing knowledge and changing behavior in the community, which will likely lessen

their impacts on water quality. While portions of this watershed-wide survey were conducted in this HA, enhanced assessment at the HA level was not completed.

#### **4.1.2.2 Sweetwater HU (909)**

Water quality assessment of the Sweetwater HU indicated there have not been any significant changes to the COCs identified for HU during this reporting year. Though monitoring results are consistent with the BLTEA priority ratings for bacteria in the Lower Sweetwater HA (909.1), the results are not supportive of the A rating for pesticides in the Middle Sweetwater HA (909.2).

The Upper Sweetwater HA contains large undeveloped areas within the Cleveland National Forest and Cuyamaca Rancho State Park, the unincorporated communities of Pine Valley, Descanso, and Alpine, and the Viejas Indian Reservation. Unincorporated rural and suburban communities characterize the Middle Sweetwater HA. The lower portion of the Sweetwater Watershed, the Lower Sweetwater HA is the most urbanized. Copermittees implemented activities to address a variety of the high priority pollutant sources, as well as monitoring to help guide the selection and implementation of future watershed activities in this HU as part of the San Diego Bay WURMP.

##### **4.1.2.2.1 Lower Sweetwater HA (909.1)**

The Lower Sweetwater HA is the most urbanized area of the Sweetwater HU and land use consist primarily of residential, streets and roadways, open space, with the remaining area consisting of a mixture of commercial/industrial businesses, schools and undeveloped land use. The high priority water quality problem in the Lower Sweetwater HA is Bacteria. Residential sources of bacteria include activities such as over irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, trash, and pet waste. Copermittees implemented seven effective water quality activities in the Lower Sweetwater HA during FY 2009. The Pet Waste Bag Activity (SDB-001) was effective in targeting and abating a source of bacteria within areas such as residential areas and parks. Copermitttees implemented Cleanup Events (SDB-004) to address trash from a number of areas in this HA. Trash and debris may result in a number of negative impacts that contribute to increased contamination, such as elevated numbers of bacteria in the water. Although monitoring to quantify the expected reductions has not been performed, it may be assumed that these activities also result in bacteria load reductions.

Copermittees effectively targeted a variety of audiences by implementing watershed education activities in the Lower Sweetwater HA. As discussed in Section 4.1.2.1.1, the Public Service Announcement (SDB-029) was also conducted in this HA. In addition, the ILACSD Elementary School Presentations (SDB-044) given to 6<sup>th</sup> graders at Rancho de la Nacion in National City indicated an average increase of 14% change in knowledge and attitude as a result of the activity.

#### **4.1.2.2 Middle Sweetwater HA (909.2)**

The Middle Sweetwater HA consists primarily of open space and undeveloped land, approximately 63% of the land use, while the rest of the HA is mostly residential use and commercial/industrial and streets and roadway land use. The high priority water quality problem in the Middle Sweetwater HA is Pesticides. There was one water quality activity implemented in this HA during FY 2009. The Land Acquisition Activity (SDB-046) precludes development from occurring and allows land to retain its natural perviousness. In this sense, it is preferable to either source abatement or pollutant load reduction because it avoids entirely the introduction of pollutant-generating activities to the watershed. Watershed educational efforts to increase awareness of pesticide use issues include the LID and Watershed Planning Education for Community Planning and Sponsor Groups Activity (SDB-043). Surveys indicated there was a 23% increase in knowledge as a result of this activity. Additionally, Copermittees distributed Integrated Pest Management (IPM) program information to residents and businesses.

Additional monitoring and source identification was identified in the Watershed Strategy as an important step in identifying appropriate BMP implementation due to limited data availability. The Water Quality Monitoring at Additional Mass Loading Stations monitoring activity (SDB-057) was implemented to characterize water quality conditions within this HA and fill data gaps. The monitoring results indicated all detections of pesticides were below WQOs. Diazinon and Chlorpyrifos were virtually non-detect in dry weather samples, while Malathion was only detected during wet weather sampling.

#### **4.1.2.3 Upper Sweetwater HA (909.3)**

The Upper Sweetwater HA consists primarily of open space and undeveloped land, or approximately 82% of the land use, while the rest of the HA is mostly residential use and agriculture. Although no pollutant category was classified as high priority in this HA, one water quality activity, the Land Acquisition Activity (SDB-046), was implemented in the Upper Sweetwater HA which directly addressed the prominent land use in this HA. The LID and Watershed Planning Education for Community Planning and Sponsor Groups (SDB-043) was an effective education activity implemented in this HA. Survey results indicated approximately 23% increase in knowledge and attitude as a result of the activity. Additional monitoring and source identification was identified in the Watershed Strategy as an important step in identifying appropriate BMP implementation due to limited data availability. The Water Quality Monitoring at Additional Mass Loading Stations monitoring activity (SDB-057) was implemented to characterize water quality conditions within this HA and fill data gaps.

#### **4.1.2.3 Otay HU (910)**

The *Basin Plan* identifies the Otay HU as the second largest of the three HUs in the San Diego Bay WMA and is one of the least populated watersheds in the San Diego County. As stated in Section 2.5.3, elevated concentrations of indicator bacteria have been detected within MS4

during urban runoff monitoring from various locations in the Coronado HA and Otay Valley HA. This result supports the BLTEA high priority (A) rating for bacteria in the two HAs.

#### **4.1.2.3.1 Coronado HA (910.1)**

There were five water quality activities implemented in the Otay HA during FY 2009 which effectively addressed bacteria and gross pollutants from a variety of land use sources. Land use in Otay HA consists primarily of residential, streets and roadways, commercial/industrial, and parks. The Pet Waste Bag Activity (SDB-001) was effective in targeting and reducing a source of bacteria within residential areas and parks. Cleanup events (SDB-004) occurred in this HA throughout the reporting period that not only effectively remove trash, but could potentially be removing bacteria and other pollutants associated with various categories of trash and debris. The Large Special Event Activity (SDB-047) was effective in enhancing recycling efforts and verifying the implementation of BMPs by vendors through inspections, potentially leading to lower levels of bacteria and trash reaching the MS4.

The Palm Ave Stormwater Diverter (SDB-052) implemented in this HA will contribute to bacteria load reductions by diverting nuisance storm drain flows to the sanitary sewer system. The inlets drain approximately 72.1 acres of residential and light commercial land uses. As such, it would eliminate one potential source of bacteria during dry weather and other low-flow conditions. During the first 6 months of monitoring, 192,000 gallons of urban runoff was diverted into the sanitary sewer and prevented from flowing to the receiving waters. There was one watershed education activity implemented in the Coronado HA during FY 2009. The ILACSD Elementary School Presentations (SDB-044) provided watershed focused pollution prevention information to 5<sup>th</sup> and 6<sup>th</sup> grade elementary students at three schools in 910.1 HA during this reporting year. Assessment of the activity indicated an average increase of 14% change in knowledge and attitude as a result of the presentations.

#### **4.1.2.3.2 Otay HA (910.2)**

There were four water quality activities implemented in the Otay HA during FY 2009 which effectively addressed bacteria and other high priority pollutants. Land use in Otay HA consists primarily of open space and undeveloped land, or approximately 49% of the land use, while residential, streets and roadways and commercial uses. The Pet Waste Bag Activity (SDB-001) was effective in targeting and reducing a source of bacteria within residential areas, as well as open spaces. Cleanup events (SDB-004), such as the Home Front Cleanup or the Beautify Chula Vista Cleanup, occurred in this HA during this reporting period. A source abatement measure includes the Updating the Recycling and Solid Waste Ordinance (SDB-035), targets residential and commercial pollutant sources. The ordinance requires that all new multi-family residential and commercial trash enclosures be built with a solid roof top enclosure in order to minimize the contact of storm water with trash areas. The roof enclosure will prevent rain water from entering the trash areas, as well as eliminate pollutant runoff from these areas.

There were five education activities implemented in this HA during this reporting year which effectively targeted a variety of audiences. As discussed in Section 4.1.2.1.1, the Public Service Announcements (SDB-029) was also conducted in this HA. As part of the ILACSD Elementary School Presentations (SDB-044) activity, the City of Chula Vista sponsored a more extensive four-day after school program called South Bay Water Warriors. Assessment indicated an average increase of 67% change in knowledge and attitude as a result of the after school program.

#### **4.1.2.3.3 Dulzura HA (910.3)**

The Dulzura HA consists primarily of open space and undeveloped land, or approximately 85% of the land use, while residential and commercial uses comprise nearly 15%. Although no pollutant category was classified as high priority in this HA, there were four water quality activities implemented during FY 2009 which effectively addressed potential sources within these land uses. The Land Acquisition Activity (SDB-046) precludes development from occurring and allows land to retain its natural perviousness. In this sense, it is preferable to either source abatement or pollutant load reduction because it avoids entirely the introduction of pollutant-generating activities to the watershed. The Pet Waste Bag Activity (SDB-001) was effective in targeting and reducing a source of bacteria within residential areas, as well as open spaces. The Water Quality Monitoring at Additional Mass Loading Stations monitoring activity (SDB-057) was implemented to provide characterized water quality conditions within this HA and two other HAs and fill data gaps.

There were five education activities implemented in this HA during this reporting year which effectively targeted a variety of audiences. An effective watershed education activity implemented during FY 2009 applicable to the HA was the Public Service Announcements (SDB-029) as discussed in Section 4.1.2.1.1. In addition, the LID and Watershed Planning Education for Community Planning and Sponsor Groups (SDB-043) indicated approximately 23% increase in knowledge and attitude as a result of the activity.

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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
908.1	Bacteria	Additional Monitoring	1	<ul style="list-style-type: none"> <li>Pet Waste Bag Programs</li> </ul>
	Gross Pollutants	Additional Monitoring	0	
	Metals	Additional Monitoring	1	<ul style="list-style-type: none"> <li>Enhanced Street Sweeping</li> </ul>
	Oil and Grease	Additional Monitoring	0	
	Pesticides	Additional Monitoring	0	
908.2	Bacteria	Load Reductions	9	<ul style="list-style-type: none"> <li>Pet Waste Bag Programs</li> <li>Trash Containment Boom Cleaning</li> <li>Targeted Automotive Inspections</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> <li>43<sup>rd</sup> and Logan Biofiltration Project</li> <li>Maple Canyon Water Quality Improvement</li> </ul>
	Metals	Load Reductions	8	<ul style="list-style-type: none"> <li>Enhanced Street Sweeping</li> <li>Targeted Auto-related Facility Inspections</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> <li>Family Stream Team Initiative Partnership</li> <li>43<sup>rd</sup> and Logan Biofiltration Project</li> <li>Chollas Creek Runoff Reduction and Groundwater Recharge Pr</li> </ul>

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	High Priority Water Quality Problems	Watershed Strategy Management Action	# of Load Reducing Activities	Load Reduction/Source Abatement Activities
908.2	Pesticides	Source Identification	1	<ul style="list-style-type: none"> <li>Municipal Rain Barrel Installation</li> </ul>
	Trash	Load Reductions	7	<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> <li>Family Stream Team Initiative</li> <li>Outdoor Special Event Oversight</li> <li>Maple Canyon Water Quality Improvement</li> </ul>
	Bacteria	Load Reductions	3	<ul style="list-style-type: none"> <li>Clean Community</li> <li>Trash Containment Boom Cleaning</li> <li>Supplemental Inspection Questionnaire</li> </ul>
908.3	Sediment	Source Identification	3	<ul style="list-style-type: none"> <li>Storm Drain Litter Control Techniques</li> <li>Enhanced Street Sweeping</li> <li>Additional Dry Weather Inspections</li> </ul>
	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>Additional Dry Weather Inspections</li> </ul>
909.1	Bacteria	Load Reductions	2	<ul style="list-style-type: none"> <li>Pet Waste Bag Programs</li> <li>Inspection Questionnaire</li> </ul>
909.2	Pesticides	Additional Monitoring	1	<ul style="list-style-type: none"> <li>Land Acquisitions</li> </ul>

**4.1.3 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.

**4.1.3.1 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.

Table 4-3. Permit Component Compliance (Level One Outcome).

Targeted Outcome	Confirmation	Report Section/Appendix
Update any watershed maps.	Completed.	1.3
Update assessments and analyses of the WMA's current and past applicable water quality data, reports, analyses, and other information, including identification of the watershed's water quality problems and high priority water quality problem(s) during the reporting period.	Completed.	2.1-2.4
Identify the likely sources, pollutant discharges, and/or other factors causing the high priority water quality problems within the watershed.	Completed.	2.1-2.4
Identify and describe the Watershed Water Quality Activities implemented by Copermittees during the reporting period.	Completed.	3.1
Update list of potential Watershed Water Quality Activities.	Completed.	3.5.1
Identify and describe the Watershed Education Activities implemented by Copermittees during the reporting period.	Completed.	3.2
Update list of potential Watershed Education Activities.	Completed.	3.5.1
Describe the public participation mechanisms used during the reporting period.	Completed.	3.3
A description of Copermittee collaboration efforts including meeting as the San Diego Bay WMA WURMP Workgroup.	Completed.	1.2
Describe the efforts implemented to encourage collaborative, watershed-based, land use planning.	Completed.	3.4
Describe all TMDL activities implemented for each approved TMDL in the watershed. The description shall include: any additional source identification information; the number, type, location, and other relevant information about BMP implementation; updates in the BMP implementation prioritization and schedule; an assessment of the effectiveness of the BMP Implementation Plan; and a discussion of the progress to date, incorporating the results of the effectiveness assessment, compliance monitoring, and an evaluation of additional efforts needed to date.	Completed.	3.5.3 and 4.2 Appendix E

As shown in the Table 4-1, the San Diego Bay WURMP Copermittees were in compliance with all Level One WURMP related Municipal Permit requirements during FY 2009.

**4.1.3.2 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 2008 San Diego Bay WURMP document. In order to assess education activities, the San Diego Bay Copermittees have established and used several means, such as conducting surveys, 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. Through activities such as LID and Watershed Planning Education for Community Planning and Sponsor Groups (SDB-043) and the ILACSD School Presentations Activity (SDB-044), Copermittees effectively demonstrated a Level Two Outcome during this reporting period. In addition, Copermittees provided storm water educational materials (i.e. brochures, fliers, and various giveaways) at many events such as the Go Green and Clean Day event in Chula Vista, the San Diego Natural History Museum Water Family Days, and various cleanups. Copermittees were also involved in supplemental educational activities that provided watershed information such as posting ads on transit shelters, billboards, and mobile ads.

In addition to the watershed education activities in Table 4-2, Copermittees collected assessment data for education activities implemented as part of other urban runoff management programs (Table 4-4) during this reporting period. The assessment information can be used by the San Diego Bay Copermittees to develop a comprehensive watershed-wide evaluation of education activities which can be used as a tool for planning future education activities and events that are able to reach Level Two and Three Outcomes. 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.

A significant education activity which occurred during this reporting year involved the co-sponsorship of a booth at the Enviro Fair at the San Diego County Fair. San Diego Bay Copermittees, along with other San Diego Region Copermittees, staffed the booth and distributed IPM education information. A region-wide survey was implemented as part of this activity and the detailed results will be reported in the FY 2009 Regional Urban Runoff Management Program (RURMP) Annual Report. A number of key findings were identified and included an assessment that the overall behavioral intention was high with 87% of respondents said they were “very” or “extremely” likely to take actions to prevent storm water pollution as a result of attending the event. In addition, eighty-one percent of respondents were able to list one thing that they could do to help prevent storm water pollution. Responses varied considerably, but the majority of participants named avoiding active polluting behaviors such as littering or pouring things in the streets, gutter, or storm drains.

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Section 4 – Effectiveness Assessment**

Table 4-4. Assessment of the San Diego Bay Education Program FY 2009.

Program	Number of Events	Number of Participants	Events with Assessment Data	General Results of Assessment Data*
Presentations and Media	248	7 million + 74 mill from Coronado – Travel Channel program about beaches	108	These programs were assessed via surveys and pre- and post-tests. Overall, results show positive behavior changes and an increase in knowledge. Refer to Appendix D-1 for more information.
School Programs and Outreach	18	Approximately 62,615	9	Pre- and post-tests indicated an increase in knowledge for all events. Refer to Appendix D-1 for more information.
Partners in Clean Water	41	17,129 participants	13	Amounts of waste collected – 6,996 pounds of trash and recyclables; 89,491 pounds of E-waste; 4,558 pounds of U-waste; and 53,970 pounds poison, flammables, paint, car batteries, and aerosols
Integrated Pest Management	3	216	2	Assessment data from both events indicated that 100% of participants deemed the events to be useful. An average 92% of participants indicated that the event influenced them to make a positive environmental behavioral change by using environmentally friendly pest management.
Project Clean Water Website	N/A	5,369 web hits for San Diego Bay	N/A	N/A

\* For events where data was available

Several water quality activities also demonstrated a Level Three Outcome during this reporting period. Several San Diego Bay Copermittees have enhanced their inspection programs to address and abate specific watershed concerns, such as sediment, bacteria or metals. 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. Positive changes in behavior and improved BMP implementation were noted from the following activities: Additional Dry Season Construction Inspections (SDB-007), Targeted Auto Facility Inspections (SDB-008), Enhanced Construction Oversight (SDB-009), and La Mesa’s Business Inspection Supplemental Questionnaire Activity (SDB-010). 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. Additional information on these inspection activities is presented in Section 3 and Appendix D-1 of this Annual Report.

Public participation in the trash and debris related activities such as the San Diego Bay WURMP sponsored Creek to Bay Cleanup event, indicate not only a change in awareness within the community of how to properly dispose of trash by the individuals involved but a change in behavior that will continue into the future. Approximately 5,790 people participated in cleanups throughout the San Diego Bay WMA in FY 2009. 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 approximately 6,500 individuals made use of HHW collection facilities in the San Diego Bay WMA and disposed of approximately 353 tons of HHW during FY 2009<sup>1</sup>.

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. A survey distributed at the Stormwater Education Booth at an Annual Pet Festival and Doggy Dash (SDB-040) revealed 80% of pet owners surveyed use bags to pick up after their pets. This indicates efforts to provide pet waste bags at public locations and to educate the public on the use of pet waste bags helps reduce pet waste from entering the MS4.

Based on the City of San Diego's annual random-digit dial 2009 *San Diego Storm Water Survey*, 29% of residents reported making a change in their behavior as a result of seeing information about the effects polluted water from storm drains has on local rivers, beaches and the ocean associated with the Public Service Announcements (SDB-029). Of those residents that had heard of "Think Blue" 40% reported that they were taking steps to change behaviors.

It should be noted that many of the activities focused on load reduction/source abatement also contribute to improvements in knowledge and positive behavior changes, though these improvements may not be directly measured. However, it is important to consider this when evaluating the overall effectiveness of the program. For example, Enhanced Street Sweeping (SDB-003) may indirectly improve the public's awareness through the installation of new "No

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<sup>1</sup> HHW is collected as part of JURMP programs and not all Copermittees are able to currently estimate collection by WMA.

Parking” signs in neighborhoods, resulting in public inquiry and media attention to understand the basis for additional street sweeping.

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

#### **4.1.3.3 Level Four Outcome – Load Reduction/Source Abatement**

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 /source abatement activities. Data was collected to show reductions of high priority pollutant loads for the Pet Waste Bag, Enhanced Street Sweeping, Trash Cleanup, and Inspection activities. In addition, Land Acquisitions (SDB-046) are effective in addressing high priority water quality problems in that this activity averts development, thereby eliminating the need for future source abatement or pollutant load reduction activities.

Individual or group-sponsored cleanup events represent another activity that significantly reduced pollutant loads within the WMA. Cleanup activities (SDB-004) conducted throughout the San Diego Bay WMA during FY 2009 removed approximately 531 tons of trash and debris from the watershed’s main tributaries, tidelands, and the San Diego Bay. Approximately 35.6 tons were collected during the 2009 Creek to Bay Cleanup. This was the fifth 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 (SDB-003) 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 1,383 tons of material and covered an additional 25,692 curb miles (2,554 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. The Targeted Aggressive Street Sweeping Pilot Project (SDB-003) 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.

These activities contribute to the overall success of the WURMP program and demonstrate the Copermittees are making progress towards achieving their program goals and objectives. Based on Level Four assessment discussed above, the San Diego Bay Copermittees believe that they are making great strides towards improving water quality due to the load reductions observed, sources abated, and the knowledge gained by each Copermittee simply by implementing these activities. Through this knowledge, activities can be improved, optimized, or replaced with more efficient ones, thus leading to the most effective program 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.

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

The results from the 2008-2009 *San Diego County Municipal Copermittees Urban Runoff Monitoring Report*, as discussed in Section 2, indicate that urban runoff water quality remained similar to conditions reported in the WURMP document. Organophosphate pesticides (Diazinon, Chlorpyrifos, and Malathion) continue to be 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 products containing diazinon 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.

#### **4.1.3.5 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 2-3 outlines the water quality ratings for the San Diego Bay WMA and the individual HUs of the watershed based on data collected from 2001 to 2006 and presented in the *Regional Urban Runoff Monitoring Report* (Weston Solutions, 2009).

### **4.2 Assessment of TMDL 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 and Dissolved Metals TMDLs**

##### Status

The Implementation Plan for the Chollas Creek Diazinon TMDL was completed in September 2004 and is currently being implemented. The Copermitees within the Chollas Creek HSA (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 Copermitees also continue to promote the use of Integrated Pest Management (IPM) practices to reduce pesticide loading into Chollas Creek.

The Chollas Creek Dissolved Metals TMDL took effect October 22, 2008 when it was approved as a Basin Plan Amendment by the Office of Administrative Law and subsequently approved by the Environmental Protection Agency in December 2008. As described in Section 1.1, the seven named dischargers collaborated on a multi-pollutant strategy for addressing the TMDL as well as the development of the required BMP Implementation Plan. The Implementation Plan was submitted to the Regional Board on October 21, 2009. The dischargers are currently implementing Phase I of the strategy.

##### Assessment

To address diazinon in FY 2009, the Copermitees 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 3-3 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 2009. Refer to Appendix C for the complete report. Highlights demonstrating how the Copermitees successfully contributed to obtaining the TMDLs goal of reducing pesticide and metals loading into Chollas Creek through education and outreach in FY 2008-2009 include:

- IPM materials were distributed at 14 community events targeting specific audience groups.
- The Copermitees 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 continue to conduct monitoring for the Chollas Creek Diazinon TMDL. Required compliance monitoring is detailed in Appendix C, the Chollas Creek Total Maximum Daily Load Compliance Monitoring Investigation Order No. R9-2004-0277 2008–2009 Water Quality Monitoring Report. In summary, exceedances for metals were observed this year and data analysis on the long-term data set at SD8(1) indicates significantly increasing trends for total and dissolved copper and zinc. The magnitude of the zinc trend is greater than for copper, but both trends are relatively shallow. Significant trends for metals were not observed at DPR2. Diazinon was not detected at either location. There are significant, observably decreasing trends for Diazinon in both the north fork and south fork of Chollas Creek since it's been banned by EPA in 2004.

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 diazinon 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.

The key objectives of the Dissolved Metals TMDL dischargers during FY 2009 included collaborating and developing the BMP Implementation Plan and establishing a consensus among stakeholders. These two objectives were accomplished in FY 2009, and the BMP Implementation Plan was submitted to the Regional Board as described above.

Though the Implementation Plan was submitted outside of this reporting period (October 2009), the dischargers implemented activities as part of their comprehensive Storm Water Programs that will help in the TMDL compliance. The Dischargers' approach in addressing the TMDL is an integrated, multi-pollutant based approach targeting metals, trash, bacteria, and pesticides as well as other pollutants. Fifty-one activities, including water quality, education, and ongoing agency-wide activities, were implemented in FY 2009.

Activity details including information on measurable targeted outcomes (Levels 1-6), assessment measures and assessment methods are presented in each discharger's BMP Implementation table located in Appendix E. However, this section includes a collective summary of some notable accomplishments. Discharger activity accomplishments for FY 2009 include:

- The removal of approximately 1980 tons of trash, the removal 12 tons and 765 cubic yards of non-native vegetation from the watershed, with an estimated 500 people participating in trash and vegetation cleanups.
- Over 1900 school children were educated on urban runoff and watershed issues during class presentations and field trips. Dischargers developed outreach booths at 36 local and regional events with a combined estimated 83,000 attendees. Impressions

estimated for the Chollas Creek Watershed for public service announcements, which air regionally, include 6,702,533 through television and 9,201,893 through radio placement.

- Through over 288 commercial, industrial, and municipal facility inspections and audits, 54 deficiencies were noted leading to 54 corrective actions. Corrective actions can include, but are not limited to, stopping/cleaning an active discharge, closing/covering open trash cans, and/or covering and maintain grease bins.
- Through an aggressive street sweeping pilot project, over 2,500 broom miles were swept removing approximately 67 tons of debris. Through the sweeping of freeways twice a month, an estimated 11 cubic yards of debris was collected from 40.8 miles.
- Seven special studies and monitoring activities were conducted, a few of which will have results available next year, and two of the dischargers provided sponsorship to the Sustainable Conservation's Break Pad Partnership to address a major source of copper.

The accomplishments listed above are not comprehensive. Details regarding all the activities that were implemented and/or are planned and made progress in FY 2009 are included in each discharger's activity table included in Appendix E. It is anticipated that over time with implementation of the Dischargers' Dissolved Metals TMDL Implementation Plan, improvements to water quality will be observed. The actions that the Dischargers' have planned are anticipated to reduce pollutant loading and address pollutant sources.

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

##### Status

The Port of San Diego and the City of San Diego are working with the RWQCB and other local stakeholders to develop a collaborative 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. A kick-off meeting was held on January 21, 2009. The named parties met on three other occasions during this reporting year: March 10, 2009, May 19, 2009, and June 4, 2009.

During this reporting period, a conceptual monitoring plan for conducting compliance monitoring for the SIYB dissolved copper TMDL was under development. The purpose of compliance monitoring within the SIYB is to determine if interim and final loading targets, including both numeric and narrative water quality objectives, are being achieved throughout the SIYB. Long-term tracking of copper loading and water quality is necessary to determine whether TMDL compliance has been attained. Compliance monitoring for the dissolved copper TMDL will include tracking of vessel hull paint conversions to non-copper-based paint; annual water quality assessments of copper levels and toxicity; and monitoring of broader range of water-column, sediment, and biotic indicators on a 5-year basis through integration with the RHMP. The RHMP is further discussed in the Activity Summary Sheet SDB-025 in Appendix D. The primary means of determining compliance with interim loading reduction targets will be tracking the

conversion of vessels from copper-based to non-copper paints on a basin-wide basis. The draft Implementation and Monitoring plans are anticipated to be finalized in FY 2010.

Assessment

The Copermittees and other named dischargers have been in the process of developing the Implementation Plan during this reporting period. 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 2009. Accomplishments include:

- The Port of San Diego continued to participate in the EPA-funded "Safer Alternatives to Copper-Based Paints" project. The objectives of the project are to identify environmentally friendly test coatings that are: 1) effective in repelling or preventing fouling growth; 2) relatively easy to clean; and 3) cost effective to apply and maintain. In October 2008, the Port completed a four-month panel testing phase in which 46 non-copper hull coatings were evaluated. Twenty-one of these coatings appeared to perform well in terms of fouling and cleaning expectations. The Port used this information during planning and implementation of the boat testing phase of the project during FY 2008-2009. Ten of the top performing alternative coatings were applied to recreational boats in April and May 2009. The Port developed a boat hull field protocol for conducting long-term testing of alternative coatings, which will be used to determine the effectiveness of the alternative coatings for the duration of the project. 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 four stakeholder meetings during this reporting period: October 13, 2008, December 10, 2008, January 21, 2009, and April 14, 2009. The objective of the stakeholder meetings was to provide project details to interested parties, as well as obtain input from the workgroup on the upcoming boat hull testing phase.
- The Port of San Diego has continued to participate in the state-wide copper sub-workgroup, led by the Department of Pesticide Regulation (DPR), to increase overall understanding of copper impacts statewide. This workgroup met twice, on January 8, 2009 and April 2, 2009.
- The Port of San Diego developed the framework for a long-term program to evaluate new and emerging hull coatings and technologies. The program will incorporate many of the testing methodologies and assessment protocols developed as part of the EPA Grant Project. The program will also develop mechanisms to continually seek new and emerging products, and develop partnerships with tenants in field testing efforts. As part

of the on-going testing, Port staff contracted several of the paint manufacturers to see if any new products were available for testing. To date, approximately 22 new alternative coatings were identified for panel testing in FY 2009-2010. The coatings to be tested include new products not previously available, as well as reformulations of several coatings from the EPA Grant Project which did not quite meet the panel testing standards.

The Port also collaborated with the SDSU College of Business' MBA Consulting Program to develop a database of interested parties of whom the Port can solicit solutions for innovative boat hull coatings. A Request for Information (RFI) solicitation was developed by the Port and distributed to interested parties in June 2009. The goal of the RFI was to identify innovative approaches to achieving a reduction in copper loading, either through the use of alternative coatings or in the form of concepts that prevent copper from impacting marine life in the area.

- The City of San Diego monitored the MS4 urban runoff contribution to SIYB to verify that the copper loading from this identified source is within the waste load allocation (WLA) and WQOs. Detailed information is provided in Activity Summary Sheet SDB-053, located in Appendix D-1.
- 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 Activity Summary Sheet SDB-025, located in Appendix D-1.

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

### **5.1 Conclusions**

The San Diego Bay Copermittees successfully completed all Level One 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 2009, the San Diego Bay WURMP achieved the following objectives: 1) implementation of activities to specifically address the sources of water quality problems at a WMA 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 WMA and HA level; 4) continued refinement of the watershed program; and 5) continue progress toward meeting WURMP goals and objectives. The comprehensive assessment of educational programs implemented through JURMP, RURMP, and WURMP demonstrates how the Copermittees have been successful in achieving Levels Two and Three by implementing extensive pollution prevention efforts directed at potential sources of high priority pollutants. In FY 2009, the Copermittees supplemented the JURMP and RURMP educational programs by implementing 11 education 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.

The Copermittees assessed the effectiveness of the activities individually as well as collectively at the HA and watershed levels in order to determine the combined impact the activities have on the targeted high priority pollutants and/or pollutant sources. Copermittees implemented 12 water quality activities which resulted in achieving Levels Three or Four by changing knowledge or behaviors, reducing discharge loads, abating potential pollutant sources, or through other quantifiable benefits to receiving water quality during FY 2009. Assessment of individual activities indicated nearly all met their assessment targets and were considered to be effective. Evaluation of the water quality activities at an HA level provided an assessment of the San Diego Bay Copermittees' collective efforts for several activities that were implemented across several HAs. These activities presented universal solutions to 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, Trash Cleanups, Enhanced Street Sweeping, and Enhanced Inspections. Copermittees also implemented different approaches or activities which focused on the same pollutant of concern and/or pollutant sources in a HA. The combined effect resulted in a greater impact on the targeted high priority water quality problems and positively influenced the effectiveness and efficiency of the WURMP program. Assessment of these activities resulted in a cross-programmatic watershed analysis of the effectiveness of these programs. 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.

The named dischargers of the Chollas Creek Dissolved Metals and Diazinon TMDLs (908.2 HA) have engaged additional assessment measures. The named dischargers have taken a holistic approach to planning, implementation, and assessment of watershed activities. The holistic approach takes into account watershed activities implemented by named dischargers under WURMP, JURMP, or other stormwater programs. The goal of integrating information from various programs is to compile data from all implemented activities in order to allow a comprehensive evaluation of watershed-wide efforts to address high priority water quality pollutants identified in the TMDL. The involvement of non-Copermittee agencies (i.e., Caltrans and the U.S. Navy) in the Chollas Creek TMDLs enables the incorporation of information on pollutant sources outside of the Copermittees' jurisdictions and the BMPs these agencies have implemented to address these sources. During this reporting period, all named dischargers implemented activities as part of their comprehensive Storm Water Programs that will help in achieving TMDL compliance. The dischargers will share this information and will apply lessons learned in the region with the goal of improving water quality in the Chollas Creek Watershed.

The San Diego Bay Copermittees believe monitoring activities provide important information which is essential to the overall success of the Watershed Strategy. During FY 2009, resources were allocated to the planning of seven Targeted Special Studies focused on high priority water quality problems and their sources within the Chollas Creek watershed (908.2). Future assessments of the Targeted Special Studies will provide information enabling Copermittees to determine the most efficient, feasible, and effective BMPs to implement within their individual jurisdictions. Monitoring results may be used to support future management decisions regarding the planning, implementation, and assessment of watershed activities. During this reporting period, 12 Monitoring and Source Identification activities were implemented. The San Diego Bay Copermittees attempted to further assess changes in receiving water quality during FY 2009, and more thorough assessments will be conducted as additional water quality and pollutant source assessment information becomes available. By acquiring a better understanding of the link between high priority pollutant sources and their impacts to water quality, Copermittees will be able to understand how the watershed activities affect urban runoff discharge and receiving 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, watershed partners, and other entities 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, jurisdictions, and non-Copermittee agencies to improve programs 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 programs.

The San Diego Bay Copermittees and other entities will continue to utilize 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. Because there is a general lack of water quality data directly related to sources, the San Diego Bay Copermittees will continue to coordinate to improve data collection and monitoring. Efforts to further refine the characterization of source inventories and water quality, such as to the HA level, will provide more useful information to the San Diego Bay WURMP. This improved identification of sources and their loading potential will enable the Copermittees to enhance effectiveness assessments of watershed activities, which will enable Copermittees to modify program activities and devote resources to specifically target the most troublesome sources using the most efficient BMPs.

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 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. In addition, the Copermittees will continue to collaborate on efforts to integrate information on JURMP related activities information into the San Diego Bay WURMP Annual Report in order to develop a comprehensive evaluation of all activities implemented to address high priority water quality problems under the various urban runoff management programs in the WMA. By evaluating the activities relevance to each other and to the high priority water quality problems and their sources, the Copermittees will be able to assess if activities are effectively targeting high priority pollutants and/or sources, or if modifications are necessary.

The Copermittees will also continue to contribute to efforts focused on 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 Copermitees and the RWQCB regarding WURMP permit language.

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**Watershed Urban Runoff Management Program  
Fiscal Year 2008-2009 Annual Report**

**Tijuana River Watershed**

**Submitted to the Regional Water Quality Control Board, San Diego Region**

**on**

**February 1, 2010**

**Prepared by the County of San Diego**

2/3/10 Regular Meeting  
Item No. 6.3

b

Last Minute Agenda Information





# County of San Diego

## LAND USE AND ENVIRONMENT GROUP

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### STATEMENT OF CERTIFICATION

#### Tijuana River Watershed Urban Runoff Management Plan (WURMP) FY 2008-09 Annual Report

I certify, under penalty of law, that this **FY 2008-2009 Tijuana River Watershed Urban Runoff Management Plan (WURMP) Annual Report** and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

*Chandra Wallar*

**CHANDRA L. WALLAR**  
Deputy Chief Administrative Officer  
County of San Diego

*1-27-10*

Date





**THE CITY OF SAN DIEGO**

January 30, 2010

**RE: Statement of Certification  
Tijuana River Watershed Urban Runoff Management Program  
Fiscal Year 2009 Annual Report**

I certify under penalty of law that the City of San Diego participated in the development of the Fiscal Year 2009 Tijuana River Watershed Urban Runoff Management Program Annual Report. City staff assisting in the preparation of the document were 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, to the best of my knowledge and belief, is 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.

\_\_\_\_\_  
Kris McFadden  
Deputy Director  
Storm Water Department  
City of San Diego

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January 12, 2010

STATEMENT OF CERTIFICATION

Tijuana River Watershed Urban Runoff Management Program Document

I certify under penalty of law that the City of Imperial Beach's contributions to the Tijuana River Watershed Urban Runoff Management Program Annual Report for FY 2008-2009 were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

H.A. Levien  
Public Works Director



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## **EXECUTIVE SUMMARY**

This annual report describes implementation of the Tijuana River Watershed Management Area Watershed Urban Runoff Management Program (WURMP) during Fiscal Year 2008-09 (FY08-09). Although much of the Tijuana River Watershed Management Area (WMA) extends into Baja California, only the portion within the County of San Diego is subject to the Municipal Stormwater Permit's WURMP requirements. Therefore, this report only addresses activities within the County of San Diego.

Section 2.0 presents a water quality assessment for the Tijuana River WMA. The assessment is largely based on the regional monitoring program conducted on behalf of the San Diego County Municipal Stormwater Copermittees in compliance with Municipal Permit requirements, but is supplemented by other monitoring programs, including jurisdictional dry weather monitoring and special studies the monitoring report is identified as "The Monitoring Report (Weston 2010)" throughout this document. It should be noted that the Municipal Permit established a monitoring schedule for the entire county that alternated monitoring between the northern watershed and the southern watersheds.

The Tijuana River WMA WURMP (2008) found that there were nine priority water quality problems in the Tijuana River WMA that are considered high priorities: Sediment (TSS/Turbidity), Pesticides, Gross Pollutants (Organics, pH, Trash), Bacteria and Trace Metals.

Section 3.0 and Attachment 1 describe the 25 watershed activities that were in various phases of implementation during FY08-09. Many of the activities address Bacteria and Trash in the Tijuana Valley Hydrologic Area (HA 911.1). Several activities occurred in the upper HAs including the LID Community Planning Group Training (TJ-014) and the County Pet Waste Bag Dispenser Program (TJ-001). Furthermore, several milestones were reached within the Trash and Sediment Characterization Study (TJ-018) and significant headway was made by Weston Solutions on the Imperial Beach Bacteria Source Study (TJ-013) unfortunately due to the budget issues in the State of California funding for this project was frozen during this reporting period. In FY08-09 due to the flood which occurred in late November 2008 and the perceived threat of additional sediment deposition from the recently constructed Federal Border Fence Infrastructure project, emergency permits (TJ-025) were sought from various resource agencies to remove sediment and trash in the Smuggler's Gulch, Pilot Channel and Northern Channel. Approximately 65,000 cubic yards of sediment will be removed from the channel and as much as 1,000 tons of trash and over 5,000 tires.

Section 4 describes the how effective the Tijuana River WMA copermittees collaborated and whether or not overall WURMP activities were appropriate and effective at the Watershed and HA level. It was determined that a lot of headway has been achieved but there is much more to do. It is hoped that the bacteria source identification study and trash and sediment characterization study will result in future effective activities at not only the WMA area level but also at the entire watershed level.

Section 5 provides a discussion on conclusions and recommendations that were reached during the reporting period.



## **SECTION 1.0 INTRODUCTION**

The NPDES Municipal Stormwater Permit, Order No. R9-2007-0001, referred to throughout this document as the “Permit” or “Municipal Permit”, requires the Copermittees sharing the Tijuana River Watershed Management Area (WMA) to collaborate on the development and implementation of a Watershed Urban Runoff Management Program (WURMP). The WURMP is a collaborative effort to address high priority surface water quality issues throughout the Tijuana River 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 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. The Watershed Activity Implementation Summary Sheets for all watershed water quality and education activities implemented during this reporting period will be included in Appendix 1.

This Annual Report is divided into five sections that highlight the efforts of the Tijuana River WMA Copermittees during the FY08-09 reporting period.

- Section 1: Provides an overview of the information included in this report, summarizes the ongoing collaboration among Tijuana River WMA Copermittees. There were no updates to the watershed maps during this reporting period.
- 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 WMA 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 5: Provides a discussion of conclusions reached during FY08-09 as well as recommendations for future reporting periods.

### **1.1 Watershed Collaboration**

WURMP development and implementation is a collaborative effort by all of the following Tijuana River WMA Copermittees:

- City of Imperial Beach
- City of San Diego
- County of San Diego

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

The Tijuana River WMA Copermittees met or participated in conference calls 6 times during this reporting period. Table 1-1 provides a summary of the dates and the general topics of discussion at these meetings. The majority of the meetings were focused on preparing the draft and final FY07-08 Tijuana River WURMP Annual Report that was submitted to the RWQCB on February 1, 2009.

During this reporting period, the Tijuana River WMA Copermittees collaborated extensively on the watershed activities that were developed through the implementation of the Watershed Strategy that was submitted on March 24, 2007 to the RWQCB.

Utilizing the information from the watershed strategy, the Tijuana River WMA Copermittees have identified several water quality activities which they have coordinated at the Hydrologic Area (HA) level. This collaborative approach was utilized because 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. Collaboration on the watershed strategy enabled the Copermittees to identify data gaps by reviewing existing monitoring and land use data which provided the basis for developing additional water quality monitoring and source identification activities. Section 3 and Appendix 1 provide specific detail on each program that was initiated or completed during the FY08-09 reporting period.

**Table 1-1: Summary of Copermittee Meetings**

Meeting (or Conference) Date	Main Topics of Discussion
10/21/08	<ul style="list-style-type: none"> <li>• Potential WURMP Revisions</li> <li>• ID Section responsibilities.</li> </ul>
12/09/08	<ul style="list-style-type: none"> <li>• Discuss and review draft sections</li> <li>• Update on status of WURMP Revisions</li> <li>• Review Schedule</li> </ul>
01/06/09	<ul style="list-style-type: none"> <li>• Conference call to discuss revisions to Sections 3 and 4</li> </ul>
01/22/09	<ul style="list-style-type: none"> <li>• Final Edits to WURMP Annual Report</li> </ul>
01/30/09	<ul style="list-style-type: none"> <li>• Obtain Signed Certification Statements</li> </ul>
04/14/09	<ul style="list-style-type: none"> <li>• Discussed Status of WURMP Revisions</li> <li>• Reviewed Ongoing and New activities</li> </ul>

In October 2008 the Tijuana River WMA Copermittee's were asked to participate in a meeting to discuss current issues and the future of the Tijuana River Valley. As a result of that meeting the Tijuana River Valley Recovery Team was formed. The Recovery Team is a collaboration of more than 30 federal, state, and local U.S. and Mexican agencies organized into four action teams and working together to implement a recovery plan for the Tijuana River Valley under the overall guidance of a policy committee.

The overall vision of Recovery Team is:

“A Tijuana River Valley free of historical trash and sediment, protected from future deposits of trash and sediment, restored to a sustained physical, chemical and biological integrity, and performing its hydrologic functions, while respecting the rights of current and future landowners and users.”

And the Mission:

To bring together the government administrative, regulatory, and funding agencies in tandem with advice from the scientific community, the environmental community, and affected stakeholders to protect the Tijuana River Valley from future accumulations of trash and sediment, identify, remove, recycle or dispose of existing trash and sediment, and restore the Tijuana River floodplain to a balanced wetland ecosystem.

Each action team developed specific missions including:

**Border Action Team:** To develop and implement solutions in the immediate vicinity of the border that will capture and divert trash and sediment before it reaches the Tijuana River Valley.

**Clean Up Action Team:** To identify, map, characterize and cleanup trash and manage sediment in the Tijuana River Valley floodplain in an environmentally sensitive way.

**Restoration Action Team:** To imagine, plan, coordinate and implement the restoration, mitigation, and flood control features of the Tijuana River Valley ecosystem from the border to the ocean.

**Binational Action Team:** To identify the sources of trash and sediment in the Tijuana River Valley watershed that impact the Tijuana River Valley floodplain and to recommend, establish, and implement a plan to abate and manage these sources in cooperation with Mexican agencies.

The Recovery team has met 8 times during FY08-09. The majority of these meetings were focused on developing strategies to characterize trash and sediment as well as identifying potential mechanisms to reduce the amount of trash and sediment from entering the river valley. Complete agendas and notes can be found on the Recovery Team website at: [www/tjriverteam.org](http://www/tjriverteam.org).

Specific efforts the Tijuana River WMA Copermittees are in line with the Mission of the Recovery Team; and include 1) cleaning and dredging the clogged channels, 2) characterizing trash and sediment in support of designing BMPs to reduce the volume of sediments and trash transported during storms (3). For details see Activity Summary Sheets TJ-012, TJ-018, TJ-022, and TJ-025 in Appendix 1 of this report.

## **1.2 Tijuana River Watershed Map Updates**

There are no Tijuana River Watershed map updates included in the FY08-09 Annual Report.

## SECTION 2.0 WATER QUALITY AND POLLUTANT SOURCE ASSESSMENT

This section summarizes the water quality assessment of the Tijuana River Watershed Management Area (WMA) using the results of the 2008–2009 monitoring. Monitoring activities conducted in compliance with RWQCB Permit Order R9 2007 0001 are provided in Table 2-1.

**Table 2-1 2008-2009 Monitoring Program Activities**

Program Data Set	Constituents Assessed
<b>Receiving Water Monitoring</b>	
Wet Weather Monitoring	Water chemistry, bacteria, toxicity, and trash
Post-Storm Sediment Pyrethroid Monitoring	Grain size, synthetic pyrethroid pesticides, and TOC.
Bight 08 Estuary Monitoring	Water (bacteria and TSS) and sediment quality (chemistry, toxicity, and benthic macroinvertebrates).
Third Party Data	Fecal indicator bacteria, Bacteroides (PCR) and general chemistry.
<b>Urban Runoff Monitoring</b>	
Jurisdictional Dry Weather Monitoring	Field and analytical chemistry, trash.
MS4 Outfall Targeted Monitoring	Chemistry, metals, pesticides and bacteria.

Within this watershed, contaminants identified on the 2006 State Water Resources Control Board (SWRCB) Section 303(d) list are provided in Table 2-2 with relevant total maximum daily load (TMDL) status. However, several changes are proposed in the 2008 Draft 303(d) List currently under development.

**Table 2-2 Tijuana River WMA SWRCB Section 303(d) Listed Waterbodies and TMDL Status**

Waterbody Name	Pollutant/Stressor on 2006 SWRCB 303(d) List	TMDL Status
Tijuana River	Indicator bacteria, eutrophic conditions, low dissolved oxygen (DO), pesticides, solids, synthetic organics, trace elements, and trash.	Not adopted
Tijuana River Estuary	Indicator bacteria, eutrophic conditions, lead, low DO, nickel, pesticides, thallium, trash, and turbidity.	Not adopted
Pacific Ocean Shoreline, Tijuana HU	Indicator bacteria.	Not adopted
Barrett Lake	Color, manganese, and pH.	Not adopted
Pine Valley Creek (Upper)	Enterococci, phosphorus, and turbidity.	Not adopted
Morena Reservoir	Color, manganese, and pH.	Not adopted

### 2.1 Water Quality Assessment

Receiving water monitoring at the MLS was conducted during one wet weather event. Annual receiving water monitoring is conducted on a rotating schedule between the north and south portions of San Diego

County as described in Table 1 of the Permit with the exception of Chollas Creek that is monitored each year. In 2008-2009, the scope of the monitoring program was adjusted due to the Copermittees participation in the Southern California Bight Regional Monitoring Program.

Each element of the Permit required monitoring program was designed to provide scientific data to address five core management questions. The core management questions, as listed in the Permit, are presented as follows:

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

The core management questions were designed to provide focus in the research and development of specific study objectives and the execution of data collection, data analysis, and reporting for this monitoring program. Elements of the monitoring program for each WMA vary across spatial and temporal scales. Therefore, data support only partial resolution of each core management question. Through continued monitoring and the refinement of the Permit requirements a more complete understanding of the answers to each of the overarching management questions may be obtained.

Assessments were conducted using data from multiple monitoring programs, and the results were applied to the relevant core management questions using a weight-of-evidence approach. The results for the Tijuana River WMA are summarized in Table 2-3.

Table 2-3 Summary of WMA Assessment Findings

Monitoring Program Elements	Assessment	Summary of Findings	Core Questions Addressed
Receiving Water Monitoring Program	Ambient Receiving Water Assessment	No exceedances or data analyzed from this program to date.	1, 2
	Wet Weather Receiving Water Assessment	Constituents of concern <sup>1</sup> : <ul style="list-style-type: none"> <li>• High frequency of occurrence (TSS, turbidity, total coliform, fecal coliform, enterococci, Diazinon).</li> <li>• Medium frequency of occurrence (BOD, COD, and total phosphorus).</li> <li>• Low frequency of occurrence (MBAS).</li> </ul> Constituents with a mean magnitude of exceedance by more than five times the benchmark included TSS, turbidity and fecal coliform, Persistent toxicity was observed to acute, chronic and reproductive endpoints of <i>Ceriodaphnia dubia</i> . The pyrethroids <sup>2</sup> Bifenthrin, Cypermethrin, and Permethrin were detected at the MLS in post-storm sediment samples at concentrations likely to cause toxicity.	
	Rapid Stream Bioassessment	Altered benthic macroinvertebrate communities (Poor to Very Poor IBI ratings) were observed based on 2002-2007 data.	
	Bight 08	Water quality results found bacteria indicators and TSS were below the benchmarks in all samples collected in the Tijuana Estuary. Sediment monitoring results identified three sites as likely unimpacted, one site as inconclusive, and one site as possibly impacted. <ul style="list-style-type: none"> <li>• A toxicity identification evaluation was conducted for the one site identified as possibly impacted and indicated naturally occurring ammonia was the causative agent of toxicity and not toxic chemicals. The overall result of the possibly impacted site was changed to likely unimpacted based on the SQO Guidance.</li> </ul>	
	Third Party	Localized discharges containing high concentrations of indicator bacteria, as well as indicators of recent human fecal pollution, were found in the MS4 system.	

<sup>1</sup> Constituents of concern are determined by a rating system that evaluates the frequency and magnitude of a constituent above its relevant criteria. Low, medium, and high frequency of occurrence describe the relative ranking of those constituents. The ranking methodology is described in Appendix B.

<sup>2</sup> The Stormwater Monitoring Coalition suggests that the synthetic pyrethroid analytical method may be highly variable (Schiff, 2009). Pyrethroid benchmarks presented in this document are for comparison purposes only and for further assessment with toxicity results.

Monitoring Program Elements	Assessment	Summary of Findings	Core Questions Addressed
		During wet weather, high concentrations of indicator bacteria were found in receiving waters, together with widespread presence of indicators of recent human fecal pollution.	
Urban Runoff Monitoring	Ambient Urban Runoff Summary (Jurisdictional, MS4,)	Results above action levels or receiving water benchmarks <ul style="list-style-type: none"> <li>• Jurisdictional: Conductivity, turbidity, Total coliform, Fecal Coliform, Enterococci.</li> <li>• MS4: pH, Total Nitrogen, Total phosphorus, Fecal Coliform, Enterococci, Total manganese, Total selenium.</li> </ul>	3,4
	Wet Weather Urban Runoff Areas Assessment (MS4)	The MS4 random wet weather data suggest that at most sites, loads appear to have been influenced by the characteristics of the catchment, particularly land use and drainage area. Additional monitoring is needed to assess the extent to which wet weather effluent from the MS4 influences receiving water conditions.	
WMA Assessment	Receiving Water Trend Assessment	Significantly increasing trends were observed for total coliforms, fecal coliforms, TSS, turbidity, total copper, total lead, total zinc, total arsenic, and nitrate. Significantly decreasing trends were observed for TDS, dissolved nickel, Diazinon, and conductivity.	5
	2001–2006 Baseline Long-Term Effectiveness Assessment Ratings	WMA high frequency of occurrence rating for TSS, turbidity, Diazinon, total coliform, fecal coliform, and enterococci were consistent with the 2001–2006 BLTEA ratings as it relates to the Tijuana Valley.	

Based on these results, each of the five Core Management Questions are addressed below.

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?

Core Management Question 1 was addressed with the wet weather data assessments. No ambient monitoring has been conducted as part of the Permit required monitoring program to date. The results of the 2008–2009 monitoring program in the Tijuana River WMA indicate that some of the constituents monitored were identified as high frequency of occurrence COC. In the Tijuana River WMA, these COC included TSS, turbidity, total coliforms, fecal coliforms, enterococci, and Diazinon. This suggests that some beneficial uses may be impaired by these constituents.

Historical stream bioassessment results indicate evidence of benthic community impairment in the Tijuana River WMA, with Poor or Very Poor IBI ratings near the MLS and TWAS since 2001. Additional analysis of the O/E ratio further suggests benthic alteration as well. The low ratings may be influenced by a number of factors, including poor in-stream physical habitat, the presence of pesticides (e.g., the synthetic pyrethroids Bifenthrin and Permethrin, as well as the organophosphate Diazinon were

detected during wet weather monitoring samples), or other constituents not monitored in this program. In addition, the pyrethroids Bifenthrin, Cypermethrin and Permethrin were detected at the MLS in post-storm sediment samples at concentrations likely to cause toxicity. The bioassessment results suggest that the receiving waters may not be protective of beneficial uses.

There were indications of persistent toxicity during wet weather to *C. dubia* in each of the three toxicity tests conducted on this test organism at the MLS. Toxicity to *C. dubia* has been observed in every storm monitored since 2001. Toxicity has been observed in *H. azteca* nine times since 2001 but not at a rate indicative of persistent toxicity. Pesticides (primarily Diazinon) are also persistently found above benchmarks in the watershed and are likely the major cause of toxicity observed to the freshwater amphipods *C. dubia* and *H. azteca*. These toxicity results suggest that the river receiving waters may not be protective of beneficial uses.

Results of the Bight 08 program suggest that the receiving waters of the estuary are protective of beneficial uses in that, none of the sites were identified as likely or clearly impacted based on the SQO Guidance. Sediment quality monitoring results identified three sites as likely unimpacted, one site as inconclusive, and one site as possibly impacted. A toxicity identification evaluation was conducted for the one site identified as possibly impacted and indicated naturally occurring ammonia was the causative agent of toxicity and not toxic chemicals. The overall result of the possibly impacted site was changed to likely unimpacted based on the SQO Guidance. The Bight 08 program also determined that, water quality was good for bacteria and TSS.

2. What is the extent and magnitude of the current or potential receiving water problems?

Core Management Question 2 was addressed with magnitude of exceedance ratios during wet weather conditions in the receiving waters; wet weather monitoring was conducted only once at the MLS in 2008–2009 due to participation in the Bight '08 Program. Exceedance ratios during wet weather at the MLS were greatest for fecal coliforms, followed by turbidity and TSS. The fecal coliform concentration during the 2008 storm event was more than 2,250 times greater than the benchmark, which is greater than the historical mean ratio of 1,187. The turbidity concentration during wet weather in 2008–2009 was approximately 74 times greater than the benchmark (historic ratio of 36). TSS concentrations during the same storm were more than 25 times greater than the benchmark concentration, as compared to the historic ratio of 19 times greater than the benchmark. These three constituents have historically had the largest exceedance ratios at the Tijuana River MLS.

Historical stream bioassessment ratings conducted in the WMA indicate a Poor benthic community at both sampling stations near the MLS and TWAS locations. The consistent rating of Poor or Very Poor at both sites near the MLS and TWAS since 2001 suggests that the extent of the impairment on the benthic community is not isolated to one area. This is also supported by the historic O/E bioassessment results, which indicate an impaired benthic community at all sites monitored within the WMA.

Bight 08 results characterized 4 of 5 sites as likely unimpacted (when considering the corrected result for the TIE as mentioned above) and 1 of 5 sites as inconclusive based on the SQO guidelines. In terms of the magnitude of the potential receiving waters problem, all sediment chemistry line of evidence (LOE) scores were either minimal or low and the sediment toxicity LOE scores were either non-toxic or low. The benthic community LOE scores indicated either low or moderate impacts.

3. What is the relative urban runoff contribution to the receiving water problem(s)?

Core Management Question 3 was partially answered through the MS4 Outfall Monitoring Program. In 2008–2009, the Tijuana River WMA MS4 was assessed through the random dry, random wet, and targeted dry programs. Eleven sites were visited as part of the random dry program, but no sites were flowing at the time of the survey. Three of the sites had ponded water, which was sampled and analyzed. Results suggest that the MS4 system may be contributing to nutrient and indicator bacteria related issues in the receiving water. However, it is important to note that none of the outfalls monitored were sampled under flowing conditions.

Four sites were assessed during storm events as part of the random wet weather program. Concentrations of several analytes, including total nitrogen, total phosphorus, and indicator bacteria, were greater than benchmarks at some sites, suggesting that wet weather runoff from the MS4 may have the potential to contribute to receiving water problems at these locations. However, it is important to note that the benchmarks used in the assessment are applicable only to receiving waters and do not apply directly to runoff emanating from the MS4. The benchmarks have been used only to help identify areas where MS4 runoff has the potential to contribute to receiving water problems, thus addressing Core Management Question 3. Normalized loads calculated for the sites assessed were greatest for most constituents primarily at one site located in the lower region of HSA 911.11 (San Ysidro HSA). The catchment for this site was characterized by primarily residential and public facility land uses.

A total of six sites in the Tijuana River WMA were visited as part of the targeted dry weather program, one of which was flowing and four were ponded at the time of the survey. Thus, 83% of the targeted dry weather sites were ponded or dry, compared to 100% of the random dry weather sites. Drought restrictions implemented in the Summer 2009 may have helped to reduce flows from some areas. However, this is historically a relatively dry watershed during non-storm conditions. The chemistry data from the flowing and ponded sites were used to address Core Management Question 3 by comparing concentration of chemical analytes in the MS4 runoff to receiving benchmarks for the following constituents: nitrate, total nitrogen, total phosphorus, dissolved cadmium, dissolved copper, dissolved lead, dissolved nickel, dissolved zinc, Chlorpyrifos, Diazinon, and indicator bacteria (i.e., fecal coliforms and enterococci). Of these, total nitrogen, total phosphorus, fecal coliforms, and enterococci had concentrations that were greater than their respective benchmarks for at least one of the six sites assessed. Concentrations of total nitrogen exceeded the benchmark most frequently followed by total phosphorus. The results suggest that effluent from the MS4 has the potential to contribute to receiving water problems at those locations where benchmarks were exceeded.

A comparison of instantaneous loads, based on constituent concentrations and flow at the time of the survey could not be made as flow was only reported at one site in the Monument HA (as all others were either ponded or dry). MS4 runoff from this site may have a greater potential for contributing to the receiving waters because of the greater instantaneous loads measured at the time of the surveys. The 2008–2009 Targeted MS4 Monitoring Program was designed to allow for a relative comparison of instantaneous loads among sites in the Tijuana River WMA; however, the results should not yet be considered representative of dry weather MS4 runoff in the watershed. More meaningful spatial comparisons can be made as a more robust data set is developed in subsequent years of the MS4 Outfall Monitoring Program.

4. What are the sources of urban runoff that contribute to receiving water problem(s)?

Core Management Question 4 is partially answered through land use analysis and limited monitoring data. The Jurisdictional DWM Program and trash assessment in the receiving waters provide some information on urban runoff sources. More detailed discussion of urban runoff sources can be found in each Copermittee's Jurisdictional Urban Runoff Monitoring Program Annual Report.

The trash assessment conducted in 2008–2009 as part of the Jurisdictional DWM Program was used to identify sources of trash in the Tijuana River WMA. A total of 35 sites were assessed for trash in the WMA, including five HSAs. The lower portion of the WMA had the greatest proportion of trash and the greatest percentage of sites with Submarginal or Poor ratings, indicating that this portion of the watershed contained the greatest amount of trash in the WMA. This result coincides with the urbanized population centers, which are also found in the lower portion of the WMA. The Tijuana Valley HA (HSA 911.12) had the only site in the Tijuana River WMA that received a Poor (i.e., more than 400 pieces) rating in the trash assessment. Trash at this site consisted primarily of food packaging, and the potential route was listed as littering. All other locations assessed during the Jurisdictional DWM Program received a rating above Submarginal.

It has been observed that trash in the Tijuana River Valley is an issue of concern, and future trash assessments will be beneficial to addressing water quality issues in the Tijuana River WMA.

5. Are conditions in receiving waters getting better or worse?

Core Management Question 5 was addressed through trend analysis of constituent concentrations from wet weather monitoring over time at the Tijuana River MLS. Based on the trend analysis, concentrations of nine constituents appear to be increasing over time, including indicator bacteria (i.e., total coliforms and fecal coliforms), TSS, turbidity, total copper, total lead, total zinc, total arsenic, and nitrate. In contrast, concentrations of TDS, dissolved nickel, and Diazinon are decreasing over time. Additionally, conductivity values appear to be decreasing over time.

Although nitrate and total arsenic concentrations appear to be increasing over time, the slopes of both are relatively shallow, and most concentrations have been well below the respective benchmark values. At the current observed rate of increase, it does not appear that these constituents will exceed wet weather benchmarks during the current Permit cycle.

A significantly increasing trend has been observed for three constituents that have been found to frequently be well above their respective benchmark values during wet weather, including fecal coliforms, TSS, and turbidity. The trend in fecal coliform concentrations have a magnitude of 106,250 MPN/100 mL/yr. This is an increase of more than 26 times the benchmark value per year, every year since monitoring began in the watershed.

Increasing trends were revealed for five constituents for which wet weather benchmark values have not been established, including total copper, total lead, total zinc, total arsenic, and indicator bacteria (i.e., total coliforms). In the case of total coliforms, the trend analysis has revealed an annual increase of 231,249 MPN/100 mL/yr.

Concentrations of Diazinon, TDS, and dissolved nickel as well as conductivity values appear to be decreasing over time at the Tijuana River MLS. In the case of Diazinon, trend analysis has revealed a

significant decrease in concentration over time however this pesticide has been detected above the benchmark in 18 of the 19 monitored storms. TDS concentrations have been below the benchmark in every monitored storm since monitoring began at the site. Future monitoring will determine if this trend can be sustained. The decreasing trend in dissolved nickel and conductivity is likely inconsequential in terms of benchmarks, since historic concentrations of these constituents have typically been low at this site.

The bioassessment ratings near the Tijuana River MLS and TWAS have been Poor to Very Poor in nearly all assessments conducted from 2001 to 2008, and there are no apparent trends in the benthic community.

Wet weather monitoring in the Tijuana River has shown observed toxicity in each of the three *C. dubia* tests in every storm monitored since 2001. Toxicity has also been demonstrated in 47% of the 19 monitored storms in the *H. azteca* 96-hr test. However, toxicity to the algae *S. capricornutum* has not been observed during any monitored storms. Although the toxicity data suggest evidence of persistent toxicity to *C. dubia* in wet weather conditions, no trends in the data set are apparent.

### Recommendations

The recommendations for this watershed are to continue with the requirements of the Permit, including monitoring at the MLS to determine long-term trends, monitoring for toxic and benthic impacts, and identification of upstream sources of COCs. The addition of two TWAS locations within the Tijuana River WMA during the 2009–2010 Monitoring Season will provide information regarding conditions in other areas of the WMA. Furthermore, conducting ambient weather monitoring at the Tijuana River MLS and TWAS locations will provide information regarding the conditions in the receiving water during dry weather. Finally, MS4 Outfall Monitoring and Source Identification Monitoring data will augment the data collected during the 2008–2009 Monitoring Season.

Specific recommendations for the Tijuana River WMA are based on the triad assessments listed in the Permit. Based on wet weather conditions, conducting TIEs to identify COCs, based on the TIE metric is recommended. In addition, Diazinon was previously identified as a causative agent and is still detected above the level expected to cause toxicity. Pyrethroids are also a likely source of toxicity to *H. azteca* based on TIEs conducted in other watersheds and observed chemistry results. Addressing upstream sources as a high priority is also recommended.

## **2.2 Pollutant Source Assessment**

The Permit requires the Tijuana River WMA Copermittees to identify the high priority water quality problems and identify the likely sources within the Tijuana River WMA and implement activities that will address these pollutants.

A key component of identifying sources of pollutants is knowledge of the land uses and the pollutant-generating activities associated with these specific land uses for example urban and agricultural land uses can result in high levels of nutrients in runoff. The Tijuana River WMA straddles the US–Mexico border with only a quarter of its 1.1 million acres lying within San Diego County. Throughout the WMA, the predominant land use is classified as vacant and undeveloped (60% on the US side, 82% on the Mexico side). On both sides of the border, the watershed becomes less populated from west to east. The major population centers in the watershed are the cities of Tijuana and Tecate in Mexico and cities of Imperial

Beach and San Diego in the US. Within the Tijuana River WMA jurisdictional control is divided amongst the County of San Diego, City of San Diego, and the City of Imperial Beach.

The likely sources of pollutants within the Tijuana River WMA are identified in Table 2-4 below. In addition to these sources the Weston Monitoring Report (2009) has identified the likely sources of trash as being the urbanized population centers found in the lower portion of the WMA which had the greatest proportion of trash and the greatest percentage of sites with Submarginal or Poor trash ratings.

The results of the 2008-2009 monitoring programs indicate that the high frequency Constituents of Concern for wet weather are TSS, turbidity, total coliforms, fecal coliforms, enterococci, Diazinon and trash. These Constituents of Concern are also high priority water quality problems that are already being addressed by the watershed activities.

Additionally pollutants for all water bodies included on the 2006 303(d) list are considered as high priority and are listed in Table 2-5 below. There are several changes being proposed for the Tijuana WMA 2008 303(d) list. These changes will be discussed in future annual reports.

**Table 2-4 Likely Sources for High Priority Pollutants**

<b>Pollutant</b>	<b>Potential Sources</b>	<b>Pollutant</b>	<b>Potential Sources</b>
Bacterial Indicators	Domestic animals	Trace Metals	Automobiles
	Sewage overflow		Industrial Waste
	Septic systems	Pesticides	Agriculture
	Wildlife		Commercial landscaping
Agriculture	Residential landscaping		
Nutrients & Oxygen	Sewage overflow		Industrial waste
	Septic systems	Gross Pollutants	Commercial
	Agriculture		Illegal disposal
Organic Compounds	Commercial landscaping		Residential
	Residential landscaping	Sediment TSS/Turbidity	Agriculture
	Sewage overflow		Grading/Construction
	Septic systems		Slope Erosion

**Table 2-5 303(d) Listings in the Tijuana River Watershed**

<b>Water Body Name</b>	<b>Hydrologic Sub Area (HSA)</b>	<b>HSA #</b>	<b>Pollutant/Stressor</b>
Tijuana River	San Ysidro	911.11	Bacteria Indicators, Eutrophic conditions, Low Dissolved Oxygen, Pesticides, Solids, Synthetic Organics, Trace Elements, Trash
Tijuana River Estuary	San Ysidro	911.11	Bacteria Indicators, Eutrophic conditions, Lead, Low Dissolved Oxygen, Nickel, Pesticides, Thallium, Trash, Turbidity
Pacific Ocean Shoreline, Tijuana HU	San Ysidro	911.11	Bacteria Indicators
Barrett Lake	Barrett Lake	911.30	Color, Manganese, pH
Pine Valley Creek (Upper)	Pine	911.41	Enterococcus, Phosphorus, Turbidity
Morena Reservoir	Morena	911.50	Color, Manganese, pH

In addition to the regional monitoring the Tijuana River WMA copermittees conducted several independent monitoring or source identification studies. These projects are discussed below.

County of San Diego Southern Watersheds Monitoring Program Report

The County of San Diego completed a monitoring activity for upper watersheds of the San Diego Bay WMA and the Tijuana River WMA during this monitoring period. The monitoring report was prepared by Brown and Caldwell was completed in March 2009 (Activity Sheet TJ-024 attachment). The project included the installation and monitoring of five mass loading stations (MLS) in the Sweetwater (2), Otay (1) and Tijuana (2) watersheds. The monitoring stations for the Tijuana River WMA were located in Pine Valley Creek where it crosses under Highway 94 and in Campo Creek where it crosses under Highway 94.

The overall purpose of the activity was to acquire more representative data for the southern watersheds which previously included only dry weather grab samples. This monitoring effort utilized two different sampling methods for dry and wet weather events. For dry weather samples, 24 hour continuous sampling was conducted and for wet weather, a flow weighted sampling method was used. Additionally bacteria sampling was accomplished with grab samples. A secondary purpose of the study is to compare water quality data from these upper watershed locations with data collected from Mass Loading Stations which are typically located toward the lower portion of the watershed.

The project was designed to collect both field (5) and laboratory (33) parameters during two storm events and two dry weather events. Field parameters included Temperature, Dissolved Oxygen, pH, Conductivity, and Turbidity. Laboratory measured parameters included: Ammonia-N, Antimony,

Arsenic (total/dissolved) Cadmium (total/dissolved) Chlorpyrifos, Chromium (total/dissolved), Coliform (total/fecal) and Entococcus, Copper (total/dissolved), Diazinon, Hardness (total), Iron (total), Lead (total/dissolved), Manganese (total) Malathion, Nickel (total/dissolved) Nitrate-N, Nitrite-N, Orthophosphate-P, Selenium (total/dissolved)TDS, Total Kjeldahl Nitrogen, Total Phosphate-P, TSS, and Zinc (total/dissolved). In addition to the above flow measurements were taken at each station to develop discharge rates and to calculate a discharge equation.

The results generally supported that the pollutant loads seen at the lower watershed MLS correlate strongly with industrial, municipal wastewater and urban runoff from the lower watershed and that pollutant loads are higher during the rainy season versus the dry season.

#### Imperial Beach Bacteria Source ID

During this reporting period, the City with funding from a Proposition 50 Clean Beach Initiative (CBI) Grant, initiated a source identification study to identify sources of bacterial contamination in the U.S. western most portion of the Tijuana River Watershed. The purpose of the study was to identify sources of bacterial contaminants and recommend appropriate actions and activities to reduce the input of those sources to the Tijuana River Watershed. Unfortunately, on December 19, 2008, the City of Imperial Beach received notification that funding for Proposition 50 projects was on hold as a result of California's failure to pass a State budget. The project was subsequently halted having only completed one sanitary survey and one wet weather monitoring event. At the printing of this report, funding had still not been reinstated by the State to complete the project.

#### Sanitary Survey Dry Weather Monitoring Results

The first sanitary survey started in October 2008 and investigated a total of 220 monitoring sites in the MS4 system for bacteria (enterococci, fecal coliforms, and Bacteroides), nutrients (ammonia, nitrate, nitrite, and orthophosphate), and general chemistry (conductivity, DO, salinity, temperature, MBAS, and pH). Of those sites, 78 had flowing or ponded water and were sampled. Sites with elevated indicator bacteria concentrations or sites with positive Bacteroides were resampled, and further investigations were made upstream to identify the source. Monitoring results from the sanitary survey found the following:

- Enterococcus concentrations were above the Basin Plan benchmark of 151 MPN/100 mL in 30 of the 78 samples.
- Fecal coliform concentrations were above the Basin Plan benchmark of 4,000 MPN/100 mL in 22 of the 78 samples.
- Methylene blue activated substance (MBAS) concentrations were above the Basin Plan benchmark of 0.5 mg/L in 43 of the 78 samples.
- Turbidity was above the Basin Plan benchmark of 20 NTU in 22 of the 78 samples.
- Ammonia concentrations were above the United States Environmental Protection Agency (USEPA) Water Quality Criteria (freshwater) in 23 of the 78 samples.
- pH was above the Basin Plan criteria in two samples where pH was found to be above 9 pH units.
- Of the 78 sites sampled for Bacteroides, five tested positive for human-specific Bacteroides.

Site specific results from the sanitary survey also identified three locations within the US portion of the watershed that were contributing elevated loads of bacteria. One location identified a storm drain line crossing the border from Mexico and flowing 0.4 miles before crossing the border again back into Mexico. The other two locations were a result of stagnant and ponded water from accumulated debris within the MS4 system. The appropriate jurisdictions were notified of the ponded water and occluded lines and cleaning maintenance resolved the issue.

#### Wet Weather Monitoring Results

On December 15, 2008, a storm water monitoring event was undertaken with pollutograph sampling at Dairy Mart, Hollister Street, and Saturn Street. Spot samples were also collected at Smuggler's Gulch and Goat Canyon. The duration of the storm lasted four days, and sampling continued through December 18. The total rainfall for the event, recorded at the Hollister Street sampling location, was 2.5 inches; however, the majority of the rainfall occurred south of the US border where rainfall was estimated at 4–6 inches and caused extensive flooding throughout the lower Tijuana River and Tijuana Estuary area. Results showed extremely high concentrations of bacteria throughout the entire storm event. Results also indicated that 7 of the 14 wet weather samples were positive for human-specific *Bacteroides*, indicating a significant presence of human fecal material during wet weather flows.

## **SECTION 3.0 IMPLEMENTATION OF WATERSHED ACTIVITIES**

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

The Tijuana River WMA Copermittees have implemented, or were actively planning, a total of twenty-two activities, seventeen are water quality activities, eight of which were in active implementation, seven active but with no WURMP credit, and two water quality monitoring activities with no WURMP credit. Also of the twenty-one activities, there were a total of four Education activities, three in active implementation and one in its planning phase. There was one Land use planning activity. Each of these activities occurred in FY08-09 and addressed some of the high priority water quality problems identified in the Tijuana River WMA WURMP (March 2008). Table 3-1 identifies each of the water quality activities and includes information pertaining to the lead jurisdiction, the hydrological area(s), and the priority pollutants which these activities targeted. For more detail on the specific activities, please refer to Attachment 1 for the Watershed Activity Summary Sheets describing the Copermittees watershed water quality activities and details regarding their anticipated implementation schedule. These activities include projects ranging from pet waste dispenser programs and trash cleanup events to land acquisition and Low Impact Design (LID) education and outreach focused on specific stakeholder constituencies.

Several watershed water quality activities are also considered education activities and are identified in Table 3-1. Progress on these specific watershed education activities have been described in the standardized template and clearly identifies what was accomplished during the reporting period and how it pertains to high priority water quality problems.

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**Table 3-1: Water Quality, Education and Land Use Activities**

Activity ID	Project Name	Lead Copermittee	Other	WQA	WQE	HA	High Priority Water Quality Problems									
							Bacteria	Trash	Sediment	Pesticides	Metals	Organics	Manganese	Gross Pollutants	Color	Nutrients
TJ-001	Pet Waste Dispenser Program	COSD		X		911.2 911.4 911.5	X									X
TJ-002	Land Acquisition within TJWMA	COSD		X		All	X	X	X	X	X	X	X	X	X	X
TJ-003	ILACSD Trash Clean-Up Sponsorship	SD		X	X	911	X	X								
TJ-004	San Diego Coastkeeper Trash Clean-up Sponsorship	SD		X	X	911	X	X								
TJ-007	Targeted Auto-Related Facility Inspections	SD		X		911.1 911.2					X					
TJ-009	Municipal Rain Barrel Installation and Downspout Disconnects	SD		X		911.1 911.2	X		X	X	X					
TJ-010	City-Wide Clean-Up Events	IB		X	X	911	X									
TJ-011	Large Special Events Inspection and Clean-Ups	IB		X	X	911	X	X								
TJ-012	Smuggler's Gulch Sediment and Debris Removal Program	COSD		X		911		X	X					X		
TJ-013	Tijuana River Bacteria Source Identification Study	IB	COSD, SD	X		911.1 911.2	X									
TJ-014	LID and Watershed Planning Education for Com & Sponsor Groups	COSD			X	All	X	X	X	X	X	X	X	X	X	X
TJ-015	Karma and Karma Second Chance PSA	SD			X	911.1 911.2	X	X						X		
TJ-017	Invasive Species Removal Program in Tijuana River Park	COSD		X		911.1	X		X							
TJ-018	Trash and Sediment Characterization Study	COSD	SD	X		911		X	X							
TJ-019	City of San Diego Strategic Plan Implementation	SD		X	X	911.1 911.2	X				X			X		

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Activity ID	Project Name	Lead Copermittee	Other	WQA	WQE	HA	High Priority Water Quality Problems									
							Bacteria	Trash	Sediment	Pesticides	Metals	Organics	Manganese	Gross Pollutants	Color	Nutrients
TJ-020	Pet Waste Dispenser Program	SD		X		911.1 911.2	X									
TJ-021	San Ysidro Festival FY08-09	SD			X	911	X	X	X							
TJ-022	Tijuana River Gross Solids BMP & Sediment BMP Design	SD		X		911		X	X							
TJ-023	Tijuana River Watershed Brochure F08-Y09	SD			X	911.1 911.2	X		X	X	X	X		X		
TJ-024	Water Quality Monitoring in the Upper Tijuana Watershed	COSD		X		911.4 911.8	X		X	X	X			X		
TJ-025	Smuggler's Gulch, Pilot Channel 7 Northern Channel Sediment and Debris Removal	SD		X		911		X	X					X		

### **3.2 Watershed Education Activities**

The Tijuana River WMA Copermittees recognize 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. Each of the Copermittees participated in or hosted several activities to promote watershed education including:

- Workshops focusing on LID BMP implementation, preventing urban runoff contamination, and ecological protection of the watershed, and water quality protection activities.
- Trash removal/river cleanup events emphasizing volunteer participation and public awareness, and proper disposal of potential contaminants from entering Tijuana river system.

Table 3-2 identifies each of the Public Participation, Education and Outreach activities that occurred during FY08-09. In addition the County of San Diego continues to sponsor the Project Clean Water Website ([www.projectcleanwater.org](http://www.projectcleanwater.org)) this website provides information pertinent to each of the watersheds in San Diego County. During FY08-09 there were total of 5,003 hits on the Tijuana River Watershed page and 3,407 hits on the Tijuana River WURMP page.

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**Table 3-2 Public Participation, Education, and Outreach Activities**

<b>Lead Copermittee</b>	<b>Date</b>	<b>Event Title</b>	<b>Site Name</b>	<b>Specific Target Audience</b>	<b>Estimated Attendees</b>	<b>Education</b>	<b>Public Outreach</b>	<b>Media</b>	<b>Assessment Conducted (Y/N)</b>
County	08/08/08	Scout Troop: Stormwater & Lake Use	Lake Morena	Children	12	X			No
County	09/15/08	Recycling & HHW	Mountain Empire High School	Students - HS	47	X	X		No
County	10/04/08	Scout Troop: Stormwater & Lake Use	Lake Morena	Children	11	X			No
County	10/09/08	LID and Watershed Planning Education to Community Planning Groups (CPG)	Potrero CPG Meeting	Potrero CPG	13	X	X		Yes - Pre/Post Tests: 10.9% increase in knowledge
County	10/14/08	LID and Watershed Planning Education to Community Planning Groups	Pine Valley CPG	Pine Valley CPG	15	X	X		Yes - Pre/Post Tests: 29.2% increase in knowledge
County	10/21/08	Green Machine	Campo Elementary	Students – Elem	102	X			No
County	10/26/08	Scout Troop: Stormwater & Lake Use	Lake Morena	Children	24	X			No
County	11/14/08	ILCSD Watershed Stewardship	Mt. Empire High School	Students - HS	24	X			Yes - Pre/Post Tests
County	11/14/08	ILCSD Watershed Stewardship	Mt. Empire High School	Students - HS	24	X			Yes - Pre/Post Tests
County	11/14/08	ILCSD Watershed Stewardship	Mt. Empire High School	Students - HS	24	X			Yes - Pre/Post Tests
County	11/24/08	LID and Watershed Planning Education to Community Planning Groups	Community Church on Oak Drive	Campo/Lake Morena CPG	35	X	X		Yes - Pre/Post Tests: 32.5% increase in knowledge

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Lead Copermittee	Date	Event Title	Site Name	Specific Target Audience	Estimated Attendees	Education	Public Outreach	Media	Assessment Conducted (Y/N)
County	12/02/08	Green Machine	Pine Valley Elementary	Students – Elem	69	X			No
County	12/03/08	Littering, Keep Your Park Clean	Pine Valley	Students	4	X			No
County	12/09/08	ILCSD Watershed Stewardship	Mt. Empire High School	Students - HS	23	X			Yes - Pre/Post Tests
County	12/10/08	ILCSD Watershed Stewardship	Mt. Empire High School	Students - HS	20	X			Yes - Pre/Post Tests
County	02/05/09	LID and Watershed Planning Education to Community Planning Groups	Boulevard Fire Station/Community Center	Boulevard CPG	14	X	X		Yes - Pre/Post Tests: 17.5% increase in knowledge
County	02/25/09	Community Health Fair	Campo Senior Wellness Fair	Campo Senior Residents	~50		X		No
County	04/09/09	Littering, Keep Your Park Clean	Pine Valley	Students	5	X			No
County	04/11/09	Scout Troop: Stormwater & Lake Use	Lake Morena	Children	16	X			No
County	04/20/09	Green Machine	Potrero Elementary	Students - Elem	75	X			No
County	04/28/09	Littering, Keep Your Park Clean	Pine Valley	Students	6	X			No
County	05/16/09	Green Machine	Elem. Science Field Day / Tierra Del Sol Middle	Students	1200	X			No
County	05/20/09	Mt. Empire School District Health Fair	Lake Morena	Students	50	X	X		No
County	05/20/09	Littering, Keep Your Park Clean	Pine Valley	Students	5	X			No

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Lead Copermittee	Date	Event Title	Site Name	Specific Target Audience	Estimated Attendees	Education	Public Outreach	Media	Assessment Conducted (Y/N)
County	05/21/09	Littering, Keep Your Park Clean	Pine Valley	Students	50	X			No
County	05/26/09	ILCSD Watershed Stewardship	Mt. Empire High School	Students - HS	23	X			Yes - Pre/Post Tests
County	06/03/09	Green Machine	Jacumba Elementary	Students - Elem	52	X			No
County	06/10/09	Green Machine	Clover Flat Elementary	Students - Elem	80	X			No
County	06/30/09	Down to Earth: Environmentally Friendly Home Gardening Video	County-wide	General Public	60 airings	X	X	X	No
County	06/30/09	How to Manage Manure: Composting for Horse Owners	County-wide	General Public	80 airings	X	X	X	No
SD	12/6/2008	SDCK Coastal Cleanup Day	San Ysidro	Gen Public	46	X	X	X	Yes, 1,860 lbs load reduction associated with sponsorship per event with an efficiency of \$1.08 per lb.
SD	4/25/2009	ILACSD Creek to Bay Cleanup	San Ysidro	Gen Public	105	X	X	X	Yes, 20,320 lbs load reduction associated with sponsorship per event with an efficiency of \$0.25 per lb.
SD	FY08-09	Admobile	Imperial Beach	Residents	N/A		X	X	The City in no longer using mobile advertising as part of its watershed program

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Lead Copermittee	Date	Event Title	Site Name	Specific Target Audience	Estimated Attendees	Education	Public Outreach	Media	Assessment Conducted (Y/N)
SD	FY08-09	Karma, Karma TV Campaign	County Wide	Res/Com/Ind	446,835		X	X	Yes, Assessment saw 25% increase in correctly answering questions regarding whether storm water is treated after seeing the public service announcement.
SD	FY08-09	Karma, Karma Radio Campaign	County Wide	Res/Com/Ind	613,459		X	X	Yes, Assessment saw 25% increase in correctly answering questions regarding whether storm water is treated after seeing the public service announcement.
SD	FY08-09	Poster Distribution	TJ WMA	Dev-Const Community	100		X	X	No
SD	FY08-09	Guidebook Distribution	TJ WMA	Bus Own / Op & Rest Emp	500		X	X	No
Imperial Beach	FY 08-09	New Employee Training: Provide training on storm water to each new employee	Public Works	Municipal Staff	4	X	X		No
Imperial Beach	7/3/2008	City Weekly FYI: Education on the RWQCB trash and sediment workshop	City of Imperial Beach	City Council and Municipal Staff	168	X		X	No
Imperial Beach	7/9/2008	Eagle and Times Newspaper: Urban runoff pollution prevention and storm water pollution tips	City of Imperial Beach	Residents	Citywide	X		X	No

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<b>Lead Copermittee</b>	<b>Date</b>	<b>Event Title</b>	<b>Site Name</b>	<b>Specific Target Audience</b>	<b>Estimated Attendees</b>	<b>Education</b>	<b>Public Outreach</b>	<b>Media</b>	<b>Assessment Conducted (Y/N)</b>
Imperial Beach	7/16/2008	US Open Sandcastle Competition: Provided information to vendors and public at US Open Sandcastle Competition	City of Imperial Beach	General Public and Commercial Business	300,000	X	X		No
Imperial Beach	7/26/2008	IB Auto Show: Education booth at annual IB Auto Show	City of Imperial Beach	General Public	1,000	X	X		No
Imperial Beach	8/14/2008	City Weekly FYI: Two articles, on e-waste recycling and City recycling program	City of Imperial Beach	City Council and Municipal Staff	168	X		X	N
Imperial Beach	8/25/2008	City Weekly FYI: Waste management of prescriptions and compost	City of Imperial Beach	City Council and Municipal Staff	168	X		X	No
Imperial Beach	9/17/2008	Municipal staff training for Public Works: JURMP components and requirements	Public Works	Municipal Staff	23	X	X		Yes (Survey) Average score of 81% on 16 questions
Imperial Beach	9/23/2008	Municipal staff training for Community Development Department	City Hall	Municipal Staff	12	X	X		Yes (Survey) Average score of 89% on 16 questions
Imperial Beach	10/17/2008	City Weekly FYI: Article on fats, oil, and grease	City of Imperial Beach	City Council and Municipal Staff	168	X		X	No
Imperial Beach	11/1/2008	Eagle and Times Newspaper: Article on fats, oil, and grease and proper disposal during the holiday season	City of Imperial Beach	Residents	Citywide	X		X	No
Imperial Beach	12/1/2008	City Bi-annual Newsletter: Four articles on storm water, FOG, special events, and recycling	City of Imperial Beach	Residents	Citywide	X		X	No

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<b>Lead Copermittee</b>	<b>Date</b>	<b>Event Title</b>	<b>Site Name</b>	<b>Specific Target Audience</b>	<b>Estimated Attendees</b>	<b>Education</b>	<b>Public Outreach</b>	<b>Media</b>	<b>Assessment Conducted (Y/N)</b>
Imperial Beach	12/12/2008	City Weekly FYI, Eagle and Times Newspaper, and San Diego Union Tribune	City of Imperial Beach	City Council, Municipal Staff, and Residents	Citywide	X		X	N
Imperial Beach	1/9/2009	City Weekly FYI: Battery Recycling at County libraries	City of Imperial Beach	City Council and Municipal Staff	168	X		X	N
Imperial Beach	2/4/2009	City Weekly FYI: Advertising e-waste recycling event	City of Imperial Beach	City Council and Municipal Staff	168			X	No
Imperial Beach	3/25/2009	Post Card: Advertising e-waste recycling event	City of Imperial Beach	Residents	27,000			X	No
Imperial Beach	3/25/2009	City Weekly FYI: Battery collection at County libraries	City of Imperial Beach	City Council and Municipal Staff	168			X	No
Imperial Beach	4/1/2009	EDCO Environmental Times: Multiple articles on storm water pollution tips, proper disposal of HHW, advertisement for special events	City of Imperial Beach	Residents	27,000	X		X	No
Imperial Beach	4/25/2009	Coastal Clean Up Day: Sponsored ILACSD for 7th Annual Coastal Clean Up Day	City of Imperial Beach	Residents	4,000	X	X		No
Imperial Beach	5/2/2009	Home Front Clean Up: Annual home front clean up events for residents to properly dispose of waste	Mar Vista High School	Residents	689	X			No

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<b>Lead Copermittee</b>	<b>Date</b>	<b>Event Title</b>	<b>Site Name</b>	<b>Specific Target Audience</b>	<b>Estimated Attendees</b>	<b>Education</b>	<b>Public Outreach</b>	<b>Media</b>	<b>Assessment Conducted (Y/N)</b>
Imperial Beach	5/10/2009	Eagle and Times Newspaper: Advertisement for light bulb exchange	City of Imperial Beach	Residents	Citywide	X		X	No
Imperial Beach	5/14/2009	City Bi-annual news letter: Urban runoff information and pollution prevention tips "After it Rains"	City of Imperial Beach	Residents	Citywide	X		X	No
Imperial Beach	5/20/2009	ILACSD school presentation: Two 5th grade presentation on storm water pollution	Imperial Beach Elementary	School Children	54	X	X		Yes (pre test 75% and post test 87%)
Imperial Beach	6/4/2009	City Weekly FYI: Water conservation and urban runoff pollution info	City of Imperial Beach	City Council and Municipal Staff	168	X		X	N
Imperial Beach	6/16/2009	ILACSD school presentation: 5th and 6th grade presentation on storm water pollution	Central Elementary	School Children	100	X	X		Yes (pre test 73% and post test 83%)

### **3.3 Public Participation Activities**

The Tijuana River WMA Copermittees continue to actively encourage the participation and input of diverse stakeholders in the development, and implementation, of the Tijuana River watershed activities. Public participation is encouraged to ensure that stakeholder interests and creative solutions are considered. A number of activities, both education and water quality, are crafted to encourage public input and involvement (Table 3-1). Public participation activities included volunteer clean-up events, outreach to specific groups such as students and residents within the Tijuana River Watershed, County wide public service announcements and the, Project Clean Water website.

The City of San Diego also completed a proposed Master Stormwater System Maintenance Program which would allow the City to conduct regular maintenance activities in the numerous channels throughout the City, including those in the Tijuana River Valley (most notably the channel in Smuggler's Gulch and the Pilot Channel). In FY08-09, the Master Plan was completed and the City's Development Services Department nearly finalized the Program Environmental Impact Report that will be released for public comment in FY09-10.

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

To encourage collaborative planning in the watershed and implementation of the Tijuana River WURMP, the Tijuana River WMA Copermittees met formally six times during FY08-09 to discuss watershed principles and develop collaborative efforts to reduce storm water pollution in the watershed, including possibilities for collaboration in land use planning (see Table 1-1). This section describes collaborative land use planning efforts within the watershed during FY08-09. The Tijuana River WMA Copermittees have identified enhanced education and cross-jurisdictional communication as key elements in lessening the potential watershed impacts resulting from jurisdictional land use decisions. Efforts are ongoing to further integrate watershed priorities into jurisdictional land use planning processes and to search for innovative opportunities to enhance collaboration at the watershed scale. JURMP annual reports contain information on individual Copermittee efforts to integrate watershed and water quality principles into local general plans and ordinances. A discussion of several collaborative land use planning efforts follows.

The Tijuana River WMA Copermittees have taken an active role in the formation of the Tijuana River Valley Recovery Team (TJRVT). The TJRVT, whose members include governmental administrative, regulatory, and funding agencies, as well as members of the scientific and environmental communities and affected stakeholders, was formed to facilitate restoration of the Tijuana River floodplain and estuary to a functional wetland ecosystem. The TJRVT met monthly throughout FY 2008-09 and continue to propose initiatives to reduce trash and sediment from reaching the Tijuana River Valley and restore natural hydrology. Additional information can be found on the Tijuana River Recovery Team website ([www.tjriverteam.org](http://www.tjriverteam.org)).

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Education:

The Tijuana River WMA Copermittees have embraced the potential of Low Impact Development (LID) approaches to effectively address the impact of pollutants and discharge volumes resulting from new and significant re-development. In addition to the education and training that is provided to the development community and municipal staff as part of baseline JURMP compliance, targeted LID efforts during this reporting period included the County of San Diego's development of a LID and Watershed Planning Education Activity. This activity is intended to educate local planning and sponsor groups on LID and watershed planning principles, practices, and requirements. The recommendations of local planning and sponsor groups have influence over whether, and under what conditions, development projects within the unincorporated County are approved. This education activity is intended to aid these advisory bodies in making informed recommendations on aspects of development projects that could affect watershed water quality. During the FY08-09 reporting period, County of San Diego staff also conducted other presentations to planning, sponsor groups and students both at the Elementary and High School level as well as Scout Troops on topics like Recycling, Stormwater and Lake Use and Littering.

The City of San Diego Storm Water Department has continued to reach the public in the Tijuana River Watershed through its radio and television public service announcements broadcasted in both English and Spanish. Additionally, the City staffed a booth and handed out educational information to residents during the San Ysidro Days event on May 16, 2009. The City continues to fund the Tijuana River National Estuarine Research Reserve (TRNERR) to conduct field trips for youth groups, implement upgrades to the [www.trnerr.org](http://www.trnerr.org) web site, and "Amigo" level sponsorship of the annual Fiesta Del Rio community event. The City plans to continue its relationship with TRNERR in the future.

Cross-Jurisdictional Communication:

The primary means of collaborative land use planning is the clear and timely communication of pending land use decisions among the WMA Copermittees. One way this is accomplished is through notification of the availability of environmental documents and public hearings pursuant to the California Environmental Quality Act (CEQA). To improve awareness of pending projects beyond CEQA requirements, the Copermittees adopted a Memorandum of Understanding in 1991 that establishes guidelines for the notification of land use and development actions approved by Copermittee agencies. Notification triggers are based on considerations of project size, location, and type as specified in the MOU. Each jurisdiction typically provides neighboring jurisdictions with the opportunity to review and comment on discretionary projects located near jurisdictional borders. Through this process, the WMA Copermittees have the ability to participate in and comment on land use planning efforts outside of their jurisdiction. By working together and creating partnerships, Copermittees provide an opportunity to 'catch' potential watershed issues from adjacent jurisdictions. Through enhanced communication and strong relationships, the WMA Copermittees are able to better address watershed needs as a whole.

Tijuana River Bacteria Source Identification Study:

One such activity that involved collaborative planning included the Tijuana River Bacteria Source Identification Study. Collaborative land use planning for the Tijuana River Bacteria Source Identification Study was achieved through the development of a Technical Advisory Stakeholder group. These stakeholder meetings encourage Copermittees to actively plan with community organizations and jointly identify potential sources of bacteria, trash, and sediment (i.e., human activity, storm outfalls), leading to generating pertinent information for field monitoring groups to collect water quality data and make a more informed assessment of pollutant sources along the river. This information is then available to storm water staff that coordinate and periodically make recommendations to jurisdictional planning department staff regarding appropriate storm water-related land use planning regulations and policies.

By pursuing a setting of coordinated dialogue and strong working relationships among each other, the WMA Copermittees are more equipped to develop collaborative land use planning efforts to address the needs of this watershed. The Tijuana River WMA Copermittees will continue its regular meetings to plan and implement the Tijuana River WURMP. Efforts are ongoing to further integrate watershed priorities into jurisdictional land use planning processes and to search for innovative opportunities to enhance collaboration at the watershed scale.

### **3.5 Updated 5-year Strategic Plan**

#### **3.5.1 New Watershed Activities**

Development of the 5-Year Strategic Plan included the formulation of a list of activities to implement over a five-year period. These activities have been integrated into the Tijuana River WURMP. The Regional Copermittees recognized that there would be a need to revise the 5-year plan as new activities were identified and implemented. During FY08-09, five new activities have been identified, two of which are watershed education activities. Descriptions of these new activities are noted below.

During FY08-09 the City of San Diego's Think Blue program participated in the San Ysidro Centennial Celebration, a community festival commemorating the 100<sup>th</sup> birthday of San Ysidro. Participation provided direct outreach to the attending 7,000 watershed residents, with a focus on water bodies in the Tijuana River Watershed Management Area (WMA).

A new brochure program for the six (6) WMAs was implemented by the City of San Diego and Think Blue. These brochures will be used to inform San Diego residents on the benefits of taking steps to reclaim an environmentally and economically healthy watershed.

The Tijuana River Gross Solids and Sediments BMP Design project involves the studies of storm water trash sediment BMP projects in the Tijuana River WMA, to reduce the volume of sediments and gross solids which are transported to the Tijuana River's main channel and the Tijuana River estuary during storm events.

During the FY08-09 reporting period the County of San Diego conducted additional dry and wet weather monitoring in the upper Tijuana Watershed. The two monitoring sites were located in Pine Creek (911.40) and Campo Creek (911.80). The purpose of the study was provide more

representative data for the upper watersheds and to also compare these with historic data collected at the lower MLS station in the Tijuana River Valley.

The City of San Diego is excavating and removing of sediment and trash in Smuggler's Gulch, Pilot Channel, and Northern Channel as part of a flood control maintenance activity. A secondary benefit of sediment and trash removal is improved water quality, due to the fact that the items are disposed of properly after removal.

### **3.5.2 Updated 5-Year Strategic Plan**

During FY08-09 several projects were modified, updated, completed or deleted from the strategic plan. These include the City of San Diego's Pet Waste Dispenser Program, Mobile Advertising, and Tijuana River Watershed Bacterial Source Identification Study. Table 3-3 represents the Tijuana River WMA Updated 5-year Strategic Plan.

The City of San Diego Pet Waste Dispenser Program was updated and was in its planning phase during FY08-09, implementation is scheduled for FY09-10, this project will target municipal and mixed-use locations with high pet use. Pet waste stations will be installed for the purpose of reducing pollutant loading of bacteria present in dog waste. There will be a targeted outreach campaign by the City's Think Blue as it relates to this project.

The use of Mobile Advertising was implemented in FY07-08 but based on results from the 2009 Storm Water Survey in which 17% of participants stated they received Think Blue Messages via Mobile advertising, it was determined the program was not effective in generating sufficient knowledge and awareness of the program or storm water issues. Therefore the City discontinued the activity in FY08-09.

The Tijuana River Watershed Bacterial Source Identification Study is currently on hold until funding from the CBI Grant is made available or additional funding from another source can be secured.

Activity TJ-006 noted in Table 3-3 as the Targeted Restaurant Facility Inspections will be eliminated as this item is covered in the General Project Activity for Targeted Inspections, activity TJ-007.

The Sweeping Route Posting and Enforcement Project was renamed to a more accurate title during its planning phase which occurred in FY08-09. The project is now titled Route Posting and Median Sweeping Pilot Study. Planning is underway for FY09-10 to conduct pilot "median" sweeping routes in the Tijuana River Watershed. Implementation of a posted route is anticipated to occur in FY10-11, with final assessment and conclusions being prepared in the first half of FY11-12.

The activity previously reported under the title Trash Segregation BMP Installation was changed to Beyer Boulevard Trash Segregation Best Management Practice (BMP) Installation due to the selection of Beyer Boulevard as a location for this project.

In April 2008, the Regional Board 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 watersheds. The final audit report was available for review by the

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San Diego Regional Copermittees in September 2008. The audit report contents 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. The San Diego Regional Copermittees have been working together with Regional Board staff to identify how the WURMPs and WURMP Permit language may be modified to meet the goals of the program more effectively.

During the past year the Regional WURMP Workgroup met several times with Regional Board staff to modify WURMP reporting requirements which resulted in a series of proposed revisions to the WURMP Annual Report including content and format. Due to the nature of the proposed changes including requested by interested stakeholders the Regional Board Staff decided that revisions should wait until re-issuance of the permit in 2012.



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**Table 3-3 Five-Year Strategic Plan for Tijuana River WMA**

TIJUANA RIVER WATERSHED	Heavy Metals	Sediment	Bacteria	Nutrients	Gross Pollutants	Trash	Dissolved Minerals	Pesticides	FY 07-08		FY 08-09		FY 09-10		FY 10-11		FY 11-12		
<b>Watershed Activities Planned</b>																			
TJ-001			X	X					WQ		WQ		WQ						
TJ-002	X	X	X	X		X	X	X	WQ		WQ		*						* unable to predict acquisitions
TJ-003			X			X			WQ		WQ		WQ						
TJ-004			X			X			WQ		WQ		WQ						
TJ-005			X			X			WQ										Project Completed in FY07-08
TJ-006			X						WQ										Activity to be covered in TJ-007
TJ-007	X								WQ		WQ		WQ						
TJ-008	X								WE				WE						No outreach was conducted in FY 08-09
TJ-009	X	X	X	X		X		X	WQ		WQ		WQ						
TJ-010			X			X			WQ		WQ		WQ						
TJ-011			X			X			WQ		WQ		WQ						
TJ-012		X							WQ		WQ		WQ						Activity did not occur in FY08-09
TJ-013			X						M	S	M	S	M	S					Funding was frozen in FY08-09
TJ-014	X	X	X	X			X	X	WE		WE		WE						Activity completed in FY08-09
TJ-015			X			X			WE		WE		WE						
TJ-016		X	X						WE										Project completed in FY07-08
TJ-017		X	X				X		WQ		WQ		WQ						
TJ-018		X				X			WQ		WQ		WQ						
TJ-019	X		X		X						LU		LU						
TJ-020			X	X							WQ		WQ	WE					
TJ-021		X	X			X					WE	PP	WE	PP					New Activity in FY08-09
TJ-022		X				X					WQ		WQ						New Activity in FY08-09
TJ-023	X	X	X	X	X	X	X	X			WE		WE						New Activity in FY08-09
TJ-024	X	X	X	X	X		X	X			M								Activity completed FY08-09
TJ-025	X				X	X					WQ		WQ						New Activity in FY08-09
<b>Potential Future Watershed Activities</b>																			
Source Identification of Metals and Ammonia	X			X															
Mobile Business Assessment Program	X																		
Infiltration BMP Retrofit	X		X																
Beyer Avenue Trash Segregation Device Installation			X			X													Project Name Change in FY08-09
Inlet Bacteria Treatment BMP Installation			X																
Green Mall Infiltration Retrofit Education and Outreach	X		X																
Irrigation Controller and Xeriscaping Incentive Program	X		X	X				X											
Route Posting and Medium Sweeping Pilot Program	X					X													Project Name Change in FY08-09
Tijuana River Valley Park Trails and Habitat Enhancement Project		X																	

WQ = Watershed Water Quality Activity (Active Implementation)  
WQ = Watershed Water Quality Activity (No WURMP Credit)  
WE = Watershed Education Activity (Active Implementation)  
WE = Watershed Education Activity (No WURMP Credit)  
LU = Watershed-base Land Use Planning Activity

PP = Watershed Public Participation Activity  
M = Water Quality Monitoring Activity (No WURMP Credit)  
S = Source ID/Characterization Activity (No WURMP Credit)  
D = Watershed Data Assessment/Management Activity  
O = Other Watershed Activity (No WURMP Credit)

## SECTION 4.0 EFFECTIVENESS ASSESSMENTS

This section of the report will assess the effectiveness of the Copermittees collaboration efforts over the year, the overall effectiveness of targeting specific water quality problems, and the collective impacts made towards reducing pollutant loads and improving receiving water quality. In order to facilitate this assessment the Copermittees agreed upon using the 2003 Framework for Effectiveness Assessment, which uses a six level hierarchical analysis to assess the effectiveness of watershed activities. The following section assesses the effectiveness of the WURMP on a whole in relation to four key program components:

1. Collaboration among Tijuana River WMA Copermittees.
2. Effectiveness of WURMP activities on addressing water quality problems and sources.
3. Evaluation of collective impact of WURMP activities on pollutant loads, urban runoff discharge quality, and receiving water quality at the HA scale.
4. Assessment of measurable targeted outcomes.

### ***1. An assessment of the Copermittees Collaboration Efforts during Reporting Period.***

The Tijuana River WMA Copermittees have collaboratively worked together over the past year to successfully implement a number of watershed and education based activities throughout the WMA. In addition to participating together on shared watershed activities, the Tijuana River WMA Copermittees met 6 times during the year to further develop and implement the Tijuana River WURMP. Copermittees also participated in a number of Tijuana River Stakeholder groups including Border 2012, Tijuana River Valley Recovery Team, and Tijuana River Bacterial Source Identification study group. The Border 2012 group met twice during the year to discuss funding and coordinated activities. The Tijuana River Valley Recovery Team met monthly to develop and implement watershed activities, including coordinating efforts on a number of WURMP activities. The Tijuana Bacterial Source Identification study group also met twice to review the results of the literature review and sanitary survey. The Tijuana River WMA Copermittees have made significant progress towards coordinating watershed activities with each other and in collaboration with the various stakeholders in the watershed. All Level 1 provisions of the WURMP were successfully met as required by the NPDES permit.

### ***2. An assessment of whether watershed activities are focused on the appropriate water quality problems and sources or whether additional information is needed to reach such conclusions.***

Copermittees collaborated and selected watershed activities that address high level priority pollutants within each jurisdiction and throughout the watershed as a whole. As noted in Section 2, bacteria and trash are two of the many high priority pollutants found throughout the watershed and were the pollutants selected as the focus for many of the watershed activities. During the current reporting period the Copermittees actively engaged in 21 water quality and education activities with 9 activities focusing on bacteria, 4 activities focusing on trash, and 7 activities focusing on both trash and bacteria. Many of the activities addressed multiple pollutants or other priority pollutants in the WMA. Table 4-1 identifies each of the water quality and water education activities that were in active implementation during the reporting period. The current distribution of watershed activities, specifically the activities that target the high priority pollutants, adequately address the likely sources of pollutants from the MS4, and in many cases

contributes to the larger effort towards restoring the Tijuana River Valley and managing the effects of cross border pollution.

**3. *A comprehensive assessment of the impact of all the WURMP Activities on the watershed's high priority problems, with a focus at the Hydrologic Area Level.***

The Tijuana River WMA is divided into 8 Hydrologic Areas. The high priority pollutants in the watershed include metals, dissolved minerals (manganese), organics, sediment, pesticides, nutrients, gross pollutants (pH), color, and bacteria/pathogens. By and large, the majority of the priority water quality problems are found in the Tijuana River Valley HA (911.1) where significant amount of pollutants are introduced from cross border sources in Mexico. Although improvements in high priority water quality problems in the watershed are difficult to quantify, the Tijuana River WMA Copermittees feel that local improvements in water quality continue to be made along the U.S. portion of the watershed through the implementation of water quality and education activities. Water quality and education activities were implemented throughout all HAs; however, water quality activities were primarily focused in the Tijuana River Valley HA (911.1), where the water quality problems are most numerous and significant.

During the reporting period, 21 activities were in the active implementation phase with 11 activities focused on water quality, 4 activities focused on education, and 6 activities focused on both education and water quality. These activities addressed several of the priority pollutants in the Tijuana River Watershed including bacteria, trash, sediment, pesticides, metals, organics, nutrients, gross pollutants, and color. Load reductions or source abatements were also achieved in 8 of the watershed activities (TJ-001, TJ-002, TJ-003, TJ-004, TJ-007, TJ-010, TJ-011, and TJ-025). Table 4-1 identifies the HA location for each activity, the priority pollutants addressed, and the results achieved during the reporting period. Detailed information on the implementation and assessment for each watershed activity is provided in the appendix of the report (Activity Summary Sheets).

**4. *Measurable targeted outcomes and assessments measures will be used to facilitate assessment wherever possible. Assessment levels one through six will be applied to the watershed as whole where applicable and feasible.***

As a whole, the Copermittees are working to expand the focus of their assessments on demonstrating the watershed-level benefits of program implementation, and will continue to do so under order R9-2007-0001. However, annual watershed assessments do not attempt to address the relationship of WURMP implementation to changes in water quality; this analysis will be confined to the Long-term Effectiveness Assessment process. The Copermittees feel that their efforts demonstrated by Level 1, 2, 3, and 4 likely had positive effects on water quality and will help establish the effectiveness of the Tijuana River watershed program. The bacteria-focused activities implemented a comprehensive method of promoting education and awareness (Level 1, 2, and 3) combined with actual load reduction and source abatement. As can be seen, levels of effectiveness for these activities had wide outcome range, with a majority emphasizing load reduction or source abatement (Level 4). The process also allowed a thorough evaluation of the WURMP and to make improvements, modifications, and changes to the program as needed. As the activities progress and become more developed in its implementation, data will become more available to design measurements that will improve the effectiveness of the activities. This will in turn lead to a better framework of assessing the activities and thereby improve the overall effectiveness of this watershed program.

**Table 4-1 Water Quality and Education Activities in Tijuana River WMA**

Activity		HA	Activity Type	Priority Problems Addressed	Level Outcome	Measurement or Other Benefit
ID No.	Project Name					
TJ-001	Pet Waste Dispenser Program	911.2 911.4 911.5	Water Quality	Bacteria	4	Maintained existing pet waste bags at 3 different County parks.
TJ-002	TJWMA Land Acquisition	All	Water Quality	All	4	113.39 acres of land acquired in the Tijuana River WMA.
TJ-003	ILACSD Trash Clean-Up Sponsorship	911	Water Quality and Education	Bacteria, Trash	1, 4	105 participants, 20,320 pounds of trash and debris
TJ-004	SD Coastkeeper Trash Clean-up Sponsorship	911	Water Quality and Education	Bacteria, Trash	1, 4	46 participants, 1,860 pounds of trash and debris
TJ-007	Targeted Auto-Related Facility Inspections	911.1 911.2	Water Quality	Metals	1, 3, 4	2 BMP corrective actions, 22 inspections with 7 follow-ups, Education materials distributed and knowledge assessed.
TJ-009	Municipal Rain Barrel Installation and Downspout Disconnects	911.1 911.2	Water Quality	Bacteria, Metals, Pesticides	1, 4	Installed two rain barrels. Assessment will be conducted during the 2009-10 rainy season
TJ-010	City-Wide Clean-Up Events	911	Water Quality	Bacteria, Trash	1, 2, 4	732 participants, 154.3 tons of material collected.
TJ-011	Large Special Events Inspection and Clean-Ups	911	Water Quality and Education	Bacteria, Trash	1, 4	12 special events with enhanced BMPs Increased awareness
TJ-012	Smuggler's Gulch Sediment and Debris Removal Program	911	Water Quality	Bacteria, Trash, Sediment	1	Program in the planning stage and will be implemented in FY09-10.
TJ-013	Tijuana River Bacteria Source Identification Study	911.1 911.2	Water Quality	Bacteria	1	Completed one sanitary survey and one wet weather monitoring event. Study suspended due to State budget problems.
TJ-014	LID and Watershed Planning Education for Com & Sponsor Groups	All	Education	All	1, 2	Community Planning Group training related to LID and watershed planning principles, practices, and requirements. 8 CPG (143 participants) and, the Manzanita band of Kumeyaay Nation (12 participants). A total of 78 pre- and post- surveys were completed.
TJ-015	Karma and Karma Second Chance PSA	911.1 911.2	Education	Bacteria, Trash	1, 2, 3	446,835 est. TV audience. 613,459 est. Radio audience. 44% expressed change in knowledge or attitude. 29% reported making changes in behavior.
TJ-017	Invasive Species Removal Program in Tijuana River	911	Water Quality	Bacteria, Sediment, Pesticides	1	Participated in the Technical Advisory Group. Finalized a "Declaration of Intent" by all public landowners in the Tijuana

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Activity		HA	Activity Type	Priority Problems Addressed	Level Outcome	Measurement or Other Benefit
ID No.	Project Name					
	Park					River Valley. Acknowledges commitment to control invasive species.
TJ-018	Trash and Sediment Characterization Study	911	Water Quality	Trash, Sediment	1	Characterize the trash and debris in the main channel of the Tijuana River basin for future removal.
TJ-019	City of San Diego Strategic Plan Implementation	911.1 911.2	Water Quality and Education	All	1	Developed Phase 1 list of activities to address high priority water quality problems
TJ-020	Pet Waste Dispenser Program	911.1 911.2	Water Quality	Bacteria	1, 4	Identified locations for new pet waste bag dispensers to be installed FY09-10.
TJ-021	San Ysidro Festival FY08-09	911	Education	Bacteria, Sediment, Metals	1, 2, 3	7,000 participants and 156 surveys administered. 84% identified actions to prevent pollution. 100% indicated willingness to engage behavior to prevent pollution.
TJ-022	Tijuana River Gross Solids BMP & Sediment BMP Design	911	Water Quality	Bacteria, Trash, Sediment	1	Multi year study and design plan to reduce the volume of sediments and gross solids which are transported into the river valley, estuary and ocean during storm events.
TJ-023	Tijuana River Watershed Brochure FY08-09	911.1 911.2	Education	All	1	Improved residential brochures to educate residents on pollutants and BMPs.
TJ-024	Water Quality Monitoring in the Upper Tijuana Watershed	911.4 911.8	Water Quality and Education	All	1	Two dry weather and one wet weather monitoring events.
TJ-025	Smuggler's Gulch, Pilot Channel & Northern Channel Sediment and Debris Removal	911	Water Quality	Sediment, Trash, Gross Pollutants	1, 4	Approximately 5,900 cubic yards of material was removed during FY08-09

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

At this time, there are no adopted TMDLs currently in effect within the Tijuana River WMA.

## **SECTION 5.0 CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Conclusions**

During FY2008-09 the Tijuana River WMA Copermittees continued to implement and improve the Tijuana River WURMP following the 5-year Watershed Strategy developed and submitted to the regional board in March of 2008. Much of the year was spent collaborating with the other Tijuana River WMA Copermittees to develop and further refine the strategy for implementing Watershed Activities in compliance with the Regional Board Order R9-2007-0001. The collaborative efforts of the Copermittees represent significant steps towards improving the water quality within the Tijuana River WMA for the benefit of residents and wildlife alike.

The condition of the receiving water and relative contribution of pollutants from urban runoff sources were assessed in the Tijuana River WMA during the reporting period through a number of different monitoring programs. Table 5-1 below presents the monitoring programs and assessments that were conducted during the reporting period. Results from the multiple monitoring programs provided some of the assessment tools necessary to answer the 5 core management questions addressed in Section 2.1 Water Quality Assessment.

The Tijuana River WMA Copermittees met six times during the year to develop the strategy as well as to develop new activities to address the High Priority Pollutants in the watershed. Collaboration was made on a number of Watershed Water Quality Activities, Watershed Education Activities, and Public Participation, Education, and Outreach Activities. Table 3-1 and Table 3-2 in Section 3.0 identify the watershed activities and information pertaining to the lead jurisdiction, the hydrologic area(s), and priority pollutants which these activities targeted.

During this reporting period, the Tijuana River WMA Copermittees implemented a total of 21 watershed activities including 11 activities focused on water quality, 4 activities focused on education, and 6 activities focused on both education and water quality. These activities also include 3 new activities from the previous year. The Tijuana River WMA Copermittees also implemented a total of 62 Public Participation, Education, and Outreach Activities that reached an estimated audience of 1,425,000 people.

Lastly, the Tijuana River WMA Copermittees demonstrated effectiveness level outcomes of Levels 1 through 4 with the implementation of the watershed and education/outreach activities during FY2008-09. The Copermittees successfully collaborated on activities targeting the high priority pollutants in the watershed, and collaborated on a comprehensive approach to address two specific pollutants of concern, trash and bacteria. During the next fiscal year the Copermittees will continue collaborate and assess the effectiveness of targeted watershed activities, and further develop programs in order to maximize benefits to water quality.

### **5.2 Recommendations**

During the last reporting period the San Diego Regional Copermittees, through the WURMP Workgroup, initiated dialogue with RWQCB staff to amend permit language where necessary to better achieve watershed program goals. The efforts to amend the WURMP language have been delayed due to the

response from Regional Board staff. The Tijuana River WMA Copermittees are still committed to improving the WURMP and will continue their involvement in this process for future reporting periods.

The Tijuana River WMA Copermittees will also continue their involvement with the Tijuana River Valley Recovery Team to incorporate goals and objectives of the Recovery Team into the evolution and development of the WURMP. The Recovery Team is a good mechanism for collaborative land use planning among the various agencies and stakeholders within the watershed and also provides the necessary forum to present and collaborate on the numerous restoration projects ongoing in the watershed. The Tijuana River Trash and Sediment Characterization study (TJ 018) is one such activity where coordination between the WURMP Copermittees and the Tijuana Recovery Team has resulted in a successful project development and implementation. The continued involvement with the Recovery Team will most likely lead to additional watershed activities being developed and implemented in the watershed.

**SECTION 6.0            REFERENCES**

California Regional Water Quality Control Board, San Diego Region. 2007, Order No. R9-2007-0001, NPDES Permit No. CAS0108758; Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District and the San Diego County Regional Airport Authority

County of San Diego, 2008, Tijuana River Watershed Urban Runoff Management Plan, March 2008.

Weston Solutions, Larry Walker Associates and Mikhail Ogawa Engineering, 2005, Baseline Long-Term Effectiveness Assessment (BLTEA), San Diego Stormwater Copermittees Jurisdictional Urban Runoff Management Program, August 2005.

Weston Solutions, 2009, San Diego County Municipal Copermittees 2008-2009 Urban Runoff Monitoring Report, Prepared for County of San Diego, January 2010.

Brown and Caldwell, 2009, County of San Diego Southern Watersheds Water Monitoring Report, Prepared for the County of San Diego, March 2009.

**ATTACHMENT 1**  
**WATERSHED ACTIVITY SUMMARY SHEETS**



**TITLE: Pet Waste Bag Dispenser Program in County Parks**  
**ID NUMBER: TJ-001**

**ACTIVITY DESCRIPTION**

The County of San Diego provides pet waste bag dispensers at County parks. The County installs, maintains, and inventories pet waste dispensers in its parks throughout the year. Two important goals of this program are to reduce the amount of pet waste found in parks and to educate the public on the need to cleanup after their pets. Realization of these goals will result in the reduction of pollutant loads, particularly bacteria and nutrients.

The County's jurisdictional goal for this five-year permit cycle is to increase the total number of parks with pet waste bag dispensers by 100% (i.e., from 26 parks to 52 parks).

**ACTIVITY IMPLEMENTATION**

**FY 2007-08 ACTIVITY IMPLEMENTATION**

During the FY 2007-08 reporting period the County of San Diego maintained 12 dispenser stations at three parks within the Tijuana River Watershed.

**FY 2008-09 ACTIVITY IMPLEMENTATION**

No additional stations were added in FY 2008-09. During this reporting period the County of San Diego continued to maintain 12 dispenser stations at three parks in the Tijuana River Watershed. The parks and the number of dispensers include:

- Lake Morena Park (4 dispensers)
- Pine Valley Park (2 dispensers)
- Potrero Park (6 dispensers)

The County's jurisdictional goal for this five-year permit cycle is to increase the total number of parks with pet waste dispensers by 100% (i.e., from 26 parks to 52 parks).

**TMDL APPLICABILITY**

N/A

**TIME SCHEDULE FOR IMPLEMENTATION**

- Maintenance of existing pet waste dispensers – Ongoing
- Addition of new dispensers in County parks – Ongoing

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria
- Nutrients

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Bacteria and nutrients have been identified as priority water quality problems in the Tijuana River Watershed. Parks have been identified as potential sources of these pollutants. Since this activity addresses a priority water quality problem and a priority source, it is consistent with the collective watershed strategy.

### **EXPECTED BENEFITS**

This activity will result in reductions of bacteria and nutrients from County parks.

### **EFFECTIVENESS MEASUREMENTS**

As described in the table below, activity effectiveness will be measured by tracking the number of pet waste bags distributed at each County park on an annual basis (Level 1). Bacteria load reductions (Level 4) will be estimated based on the number of bags distributed and the following assumptions obtained from a 2004 study completed by the County at the San Elijo Lagoon Ecological Reserve:

- Assumption 1: The average weight of pet waste per bag is approximately 0.2 lbs
- Assumption 2: In addition to the bags taken from the County's dispensers, an additional 30% of pet waste bags are brought to the parks by the pet owners themselves.

<b>Facility Name</b>	<b># of Stations</b>	<b># of Bags Used</b>	<b>Waste Reduction Lbs.</b>
Lake Morena	4	10,760	2,152
Pine Valley	2	6,840	1,368
Potrero	6	18,500	3,700
<b>Total</b>	<b>12</b>	<b>36,100</b>	<b>7,220</b>

**TITLE: LAND ACQUISITIONS FOR TIJUANA RIVER WMA**  
**ID NUMBER: TJ-002**

**ACTIVITY DESCRIPTION**

The San Diego County Board of Supervisors approved the Multiple Species Conservation Program (MSCP) in 1997 as an integral part of the County’s efforts to protect parks and open space. The goal of the MSCP (a 50-year program) is to maintain and enhance biological diversity in the region and maintain viable populations of endangered, threatened, and key sensitive species and their habitats. Land acquisition also provides a significant water quality benefit for the watersheds in which it occurs. MSCP acquisition precludes development from occurring and allows land to retain its natural perviousness.

The MSCP is a cooperative effort among the County and other local jurisdictions and the U.S. Fish and Wildlife Service and the California Department of Fish and Game (the Wildlife Agencies). These public partners work with various private landowners, conservation groups, and community planning groups, developers, and other stakeholders. The County of San Diego has adopted an MSCP for the southwestern portion of the County. MSCP plans for the Northern and Eastern portion of the County are in the planning stages. It is expected that the Northern Subarea Plan may be approved during the lifetime of the current stormwater permit. While the northern and eastern plan have yet to be approved by the County of San Diego, lands have been and will continue to be acquired from willing sellers.

**ACTIVITY IMPLEMENTATION FY2007-08**

During the FY2007-08 reporting period there was 5.52 acres of land acquired in the Tijuana River WMA.

**ACTIVITY IMPLEMENTATION FY2008-09**

During the FY2008-09 reporting period there was 113.39 acres of land acquired in the Tijuana River WMA.

<b>Property</b>	<b>Acres</b>	<b>Date</b>	<b>Watershed ID</b>	<b>APN(s)</b>
Potrero-Clarke	19.60	8/20/2008	911.25	653-111-03
Gavin et al Mason Wildlife	80.61	10/31/2008	911.25	653-120-27
Gavin- Mason Wildlife	13.18	1/12/2009	911.25	653-120-28
<b>TOTAL</b>	<b>113.39</b>			

**TMDL APPLICABILITY**

While it may be supportive of TMDL goals, this activity is not specifically implemented as part of a TMDL compliance program.

**TIME SCHEDULE FOR IMPLEMENTATION**

The County of San Diego acquires land on an ongoing basis from willing sellers.

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

### **OTHER PARTICIPATING ENTITIES**

- U.S. Fish and Wildlife Service
- California Department of Fish and Game
- Private land owners
- Conservation groups
- Community planning groups
- Developers

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- All

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Land acquisition is consistent with the collective watershed strategy in that it averts development, thereby eliminating the possibility of future sources in need of abatement or future pollutant loads in need of reduction.

### **EFFECTIVENESS ASSESSMENT**

Activity effectiveness will be measured by tracking the number and total acreage of land acquisitions within the watershed on an annual basis. It may also be possible to estimate pollutant loadings avoided as a result of these acquisitions. The County will consider presenting load reduction estimations in WURMP Annual Reports if it determines that they are helpful for the purposes of assessing overall program effectiveness.

**TITLE: I Love a Clean San Diego Trash Cleanup Sponsorship**  
**ID NUMBER: TJ-003**

### **ACTIVITY IMPLEMENTATION**

Each spring, I Love A Clean San Diego (ILACSD) conducts its Creek to Bay Cleanup event to target various inland and coastal sites in San Diego County in need of trash and debris removal. ILACSD recruits and organizes site captains and groups of volunteers for each site. A media center is also designated, which promotes environmental stewardship, including the importance of keeping litter and debris from spoiling the region's watersheds. The whole event is marketed throughout San Diego County through a variety of media, including television, radio public service announcements, newspapers, newsletters, electronic mail, bulletin boards, community outreach activities, calendar listings, and word of mouth.

The ILACSD Creek to Bay Cleanup occurred on April 25, 2009. The City of San Diego (City) sponsored the San Ysidro - Beyer Blvd. site in the Tijuana River Watershed Management Area (WMA). Approximately 105 volunteers removed and recycled 20,320 lbs of trash and debris.

Based on the information above, the effectiveness assessment section, and the total amount of trash removed leading to a load reduction of bacteria, a high priority water quality problem, the City requests credit for a trash cleanup activity as a watershed water quality activity.

### **TMDL APPLICABILITY**

- None

### **TIME SCHEDULE FOR IMPLEMENTATION**

The Creek to Bay Cleanup has historically been held in April of each year. Prior to that month, the City will coordinate with ILACSD staff to ensure that sites within the Tijuana River WMA are included in the list for cleanups and that proper sponsorship arrangements are made.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

### **OTHER PARTICIPATING ENTITIES**

- I Love a Clean San Diego (ILACSD)
- Volunteers from general public

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Tijuana River WMA identify bacteria as a high priority water quality problem throughout the WMA, and recommend implementing load reduction/source abatement activities to address it. Sponsorship of the Creek to Bay Cleanup will result in load reduction of trash and debris directly and of bacteria indirectly.

## EFFECTIVENESS ASSESSMENT

<b>Watershed: Tijuana River</b>		
<b>ILACSD CREEK TO BAY CLEANUP SPONSORSHIP</b>		
<b>Assess the Efficiency and Effectiveness of Sponsoring ILACSD's Cleanup Efforts to Remove Litter from Public Areas and Waterways</b>		
<b>Management Questions</b>	<ul style="list-style-type: none"> <li>• What is the load reduction associated with sponsorship?</li> <li>• What is the efficiency of the sponsored cleanup? (\$/person or \$/lb collected)</li> </ul>	
<b>Targeted Measurable Outcome(s)</b>	Load reduction due to reduction of trash (any amount) due to trash cleanup sponsorship	
<b>Assessment Method(s)</b>	<ul style="list-style-type: none"> <li>• Tabulation (e.g., number of participants)</li> <li>• Quantification (e.g., pounds of trash collected)</li> </ul>	
	Total pounds of trash removed and recycled (Outcome Level 4)	20,320 pounds
	Number of participants (Outcome Level 1)	105
	Total money spent on cleanups for all six watersheds (Outcome Level 1)	\$30,000
	Estimated amount of money spent on cleanups for Tijuana River watershed (Outcome Level 1)	\$5,000*
	Activity Efficiency (Total Cost/Total Pounds Removed)	\$0.25/pound

\*Calculated by dividing total sponsorship cost by six watersheds.

### **Objectives**

The goal of this assessment is to determine the effectiveness and efficiency of trash cleanup days for actively reducing pollutant loads.

### **Analysis and Results**

On April 25, 2009, 105 participants removed and recycled approximately 20,320 pounds of trash and debris from numerous sites in the Tijuana River WMA. The average estimated sponsorship cost for the City of San Diego was \$5,000 per watershed (\$30,000/6 watersheds with City sponsorship). Thus, there was a 20,320 pound load reduction associated with sponsorship per yearly event, with an efficiency of \$0.25 per pound collected. The efficiency was calculated by dividing the estimated sponsorship cost for the Tijuana River WMA by the pounds of trash removed.

### **Conclusions**

Implementation and assessment of load reduction and efficiency for the Coastal Cleanup Day sponsorship will occur again in FY 2010. Future results may be used to compare various types of trash cleanups completed and their associated costs as well as comparing the same types of trash cleanups that are sponsored each year over time.

**TITLE:** Coastal Cleanup Day Sponsorship  
**ID NUMBER:** TJ-004

### **ACTIVITY IMPLEMENTATION**

Each fall, San Diego Coastkeeper (SDCK) conducts the Coastal Cleanup Day event to target various inland and coastal sites in San Diego County in need of trash and debris removal. Coastkeeper recruits and organizes site captains and groups of volunteers for each site. A media center is also designated, which promotes environmental stewardship, including the importance of keeping litter and debris from spoiling the region's watersheds. The whole event is marketed throughout San Diego County through a variety of media, including television, radio public service announcements, newspapers, newsletters, electronic mail, bulletin boards, community outreach activities, calendar listings, and word of mouth.

Coastal Cleanup Day occurred on December 6, 2008. The City of San Diego (City) sponsored the Otay Mesa Open Space site in the Tijuana River Watershed Management Area (WMA). Approximately 46 volunteers removed 1,860 pounds of trash and debris. Volunteers were asked to track the debris collected by filling out data cards provided by the Ocean Conservancy.

Based on the information above, the effectiveness assessment below, and the total amount of trash removed leading to a load reduction of bacteria, a high priority water quality problem, this trash cleanup activity fulfills credit as a watershed water quality activity for FY 2009.

### **TMDL APPLICABILITY**

- None

### **TIME SCHEDULE FOR IMPLEMENTATION**

Coastal Cleanup Day has historically been held in September of each year. Prior to that month, the City will coordinate with Coastkeeper staff to ensure that sites within the Tijuana River WMA are included in the list for cleanups, and that proper sponsorship arrangements are made.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

### **OTHER PARTICIPATING ENTITIES**

- San Diego Coastkeeper
- I Love a Clean San Diego (ILACSD)
- Volunteers from general public

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Tijuana River WMA identify bacteria as a high priority water quality problem throughout the WMA, and recommend implementing load reduction/source abatement activities to address it. Sponsorship of Coastal Cleanup Day will result in load reduction of trash and debris directly and of bacteria indirectly.

## EFFECTIVENESS ASSESSMENT

<b>Watershed: Tijuana River</b>		
<b>SDCK COASTAL CLEANUP DAY SPONSORSHIP</b>		
<b>Assess the Efficiency and Effectiveness of Sponsoring SDKC's Cleanup Efforts to Remove Litter from Public Areas and Waterways</b>		
<b>Management Questions</b>	<ul style="list-style-type: none"> <li>• What is the load reduction associated with sponsorship?</li> <li>• What is the efficiency of trash cleanup? (\$/person or \$/pound collected)</li> </ul>	
<b>Targeted Measurable Outcome(s)</b>	Achieve load reduction due to reduction of trash due to trash cleanup sponsorship	
<b>Assessment Method(s)</b>	<ul style="list-style-type: none"> <li>• Tabulation (e.g., number of participants)</li> <li>• Quantification (e.g., pounds of trash collected)</li> </ul>	
<b>Data Recorded</b>		
	Pounds of trash removed (Outcome Level 4)	1,860 pounds
	Number of participants (Outcome Level 1)	46
	Amount of money spent on cleanups for all six watersheds (Outcome Level 1)	\$12,000
	Amount of money spent on cleanups for the Los Peñasquitos watershed (Outcome Level 1)	\$2,000
	Activity Efficiency (Total Cost/Total Pounds Removed)	\$1.08/pound

### **Objectives**

The goal of this assessment is to determine the effectiveness and efficiency of trash cleanup days for actively reducing pollutant load.

### **Analysis and Results**

The event's debris removal was tracked using data cards provided by the Ocean Conservancy, a 1,860 pound load reduction was recorded. There was a total of \$12,000 estimated for the sponsorship cost for all six WMAs in the City's jurisdiction and 46 participants for this WMA. It was anticipated that the sponsorship fee at that level would remain the same for subsequent years. The event's efficiency, calculated by dividing the sponsorship cost for the Tijuana River WMA by the pounds of trash removed, was \$1.08 per pound.

### **Conclusions**

Implementation and assessment of load reduction and efficiency for the Coastal Cleanup Day sponsorship will occur again in FY 2010. Future results may be used to compare various types of trash cleanups completed and their associated costs as well as comparing the same types of trash cleanups that are sponsored each year over time.

Based on the total amount of trash removed leading to a load reduction of bacteria, a high priority water quality problem, this trash cleanup activity fulfills a watershed water quality activity for FY 2009.

**TITLE:** Tijuana River Targeted Facility Inspections  
**ID NUMBER:** TJ-007

### **ACTIVITY IMPLEMENTATION**

This activity has been modified during the past two reporting periods. Initially the project was a focused inspection activity that included activities in several watersheds to increase the statistical significance of the data collected from such a collective effort. The focus was to be on restaurants, animal, landscaping and automotive facilities. However, in the past two reporting periods, the City determined that it would be more beneficial to specifically target automotive facilities in the Tijuana Watershed. As a result, the previous ID number TJ-006 will be retired and no longer used to identify this activity – it will be identified as TJ-007.

This activity is part of a larger study in the Mission Bay, San Diego Bay and Tijuana River watershed management areas. The City of San Diego developed and implemented a focused inspection activity designed and implemented to answer the following management questions related to the implementation of commercial/industrial inspection programs:

- 1) What is the optimal frequency (within resource limitations) of inspections for Automotive Repair Facilities?
- 2) Does type of business ownership change the required inspection frequencies?
- 3) Based on information collected during inspections, can the inventory of specific source types, in this case automotive facilities, be feasibly prioritized?

The focus of the activity during FY 2009 was to develop the activity and implement the first round of inspections that would establish the baseline data set for comparison after the second and third round of inspections are completed.

The initial findings included problems primarily in outdoor storage and activity areas without proper BMP implementation or good-housekeeping practices. The findings for the FY 2009 activity implementation do not completely answer the management questions, however, by the end of the program, it is anticipated that these questions will be answered.

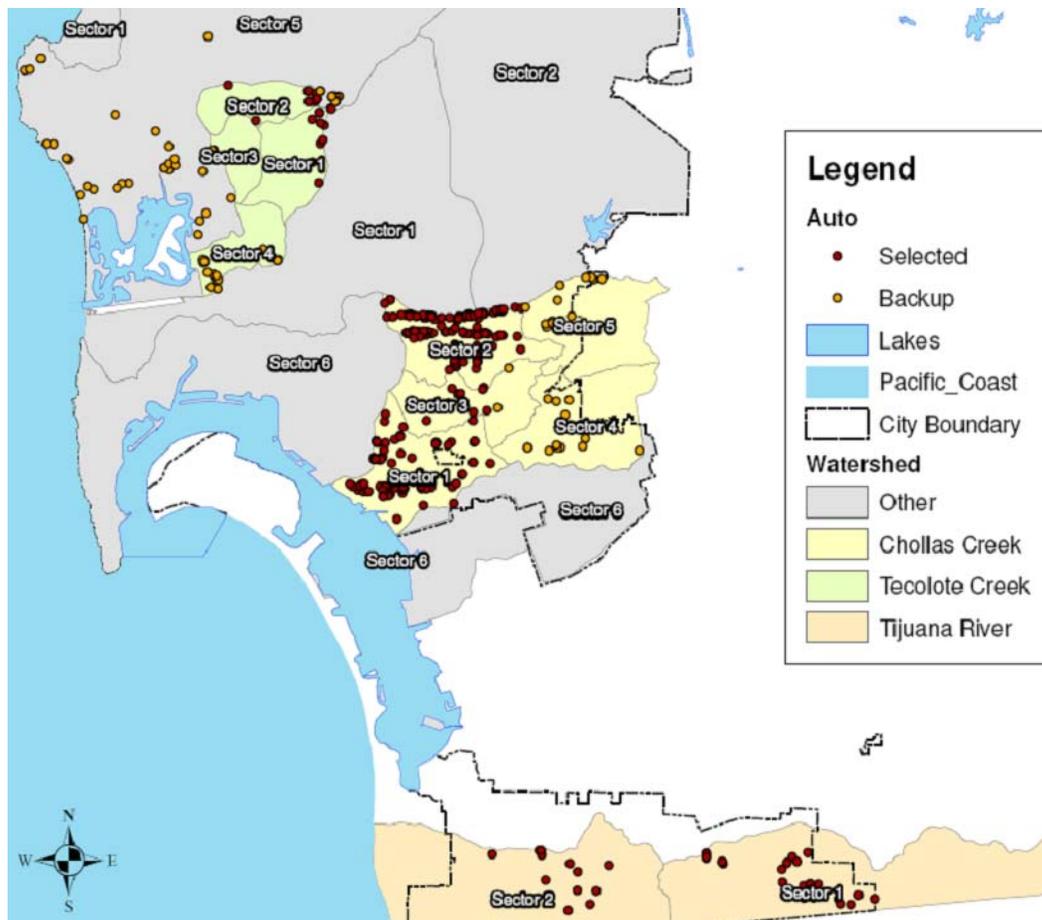
In FY 2009 a total of 22 full inspections were completed at auto shops in the Tijuana River WMA.

#### **Facilities**

During FY 2009, the City conducted the first round of its automotive facility inspections from February through May 2009. 278 inspections were conducted as follows:

- Mission Bay Watershed – 65 inspections
- Chollas Watershed – 191 inspections
- Tijuana Watershed – 22 inspections

Approximately 50% of these businesses (139) are scheduled to receive a second inspection in FY 2010, starting in August 2009. In addition, all 278 businesses will be re-inspected again starting in February 2010 to be able to compare the results of the inspections for a complete annual cycle.



**Figure 1 – Mapping of the facilities inspected (all three watershed areas)**

During FY 2009, many of the alternative locations were utilized to obtain the 278 inspections due to the lack of primary and secondary sites to be inspected. Many of the businesses were no longer in business or had relocated and were not “inspectable”.

**Public Outreach**

The City sent out a letter to business owners informing them of the inspections. The notice provided basic information about the City’s inspection program and informed the recipient that they may be subject to multiple inspections.

**TMDL APPLICABILITY**

- N/A

**TIME SCHEDULE FOR IMPLEMENTATION**

The City will conduct its second and third rounds of inspections in August 2009 and February 2010 respectively. Data analysis and activity assessment will occur between April and June 2010 for reporting in the FY 2010 Annual Report.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

**OTHER PARTICIPATING ENTITIES**

- N/A

## **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

The Tijuana River WMA inspections target sources of heavy metals.

## **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Collective Watershed Strategy for the Tijuana River WMA identifies metals as high priority water quality problems in the Tijuana River WMA and recommends implementing load reduction/source abatement activities to address them. Implementation of these targeted inspections contributes to addressing discharges, correcting behaviors, and abating sources associated with bacteria and metals.

## **EFFECTIVENESS ASSESSMENT**

### Baseline Data

Baseline data collected during FY 2009 will be the basis of comparison for changes in findings when compared to mid-year inspections and annual inspections. Pollutant Discharge Potential Assessment (PDPA), BMP Knowledge and findings of violations will be compared to inspections conducted in FY 2010.

### Data Collection Methods – Inspections

The City completed the inspections utilizing existing inspection forms with supplemental questions to capture the information necessary to answer the three management questions.

As with all inspections conducted by the City, during these watershed inspections, if violations were identified, they were noted for follow-up as appropriate. Follow-up inspections will occur as appropriate based on the identified violations. If discharges were identified, the City's inspector immediately reported these incidents to the City's code enforcement group. This enabled the City to take immediate actions to abate sources and have a direct positive impact on load reductions.

### Findings

The following represents the primary findings of the activity. Of the 278 inspections conducted:

- One (1) had an illicit discharge identified during the inspections
- 60 had identifiable violations of the City's municipal code/minimum BMPs
- 25 had made at least one correction to violations during the inspections
- 89% (247 sites) implemented BMPs for liquids storage
- 23% (64 sites) performed at least some maintenance outdoors
- 57% (159 sites) have outdoor storage of materials – 29% (46 sites) did not implement any BMPs.

In general, the violations for poor BMP implementation were related to outdoor activities, materials/parts storage and lack of good-housekeeping practices. Many of the issues would be resolved if the facilities had structural changes to cover the outdoor operations and activities.

Additionally, the baseline data for the purposes of comparison of the varying inspection frequencies are identified in the table below. These assessment results will be compared to the 6-month inspection results as well as the final annual inspection results to compare and contrast the results based on the frequencies of inspections.

**Table 1 – Stormwater Knowledge & BMP Assessments**

<b>Inspection Category</b>	<b>Inspections</b>	<b>Average Knowledge*</b>	<b>Average BMP*</b>
FY 2009 WURMP Automotive Inspections	278	1.2	2.8
Automotive inspections – non WURMP	576	2.0	2.8
All Inspections (historic JURMP)	5,082	2.3	3.0

\* Scale is from 1 (lowest) to 5 (highest)

**Table 2–Effectiveness Assessment for Activity**

<b>Watershed: Tijuana River</b>		
<b>TARGETED FACILITY INSPECTIONS</b>		
<b>Assess Efficiency and Effectiveness of Facility Inspections</b>		
<b>Management Questions</b>	<ul style="list-style-type: none"> <li>• What is the optimal frequency of inspections for Automotive Repair Facilities?</li> <li>• Does type of business ownership change the required inspection frequencies?</li> <li>• Based on information collected during inspections, can the inventory of specific source types, in this case automotive facilities, be feasibly prioritized?</li> </ul>	
<b>Targeted Measurable Outcomes</b>	<ul style="list-style-type: none"> <li>• Source abatement due to inspections</li> <li>• Increased BMP implementation due to inspections</li> </ul>	
<b>Assessment Methods</b>	<ul style="list-style-type: none"> <li>• Inspections (e.g., track number of BMPs implemented, increased number of BMPs, number of follow-up inspections)</li> <li>• Quantification (e.g., use frequency of BMP implementation to estimate source abatement)</li> <li>• Tabulation (e.g., amount of money spent on inspections, amount of money spent on educational materials)</li> <li>• Reporting (e.g., estimates of source abatement for BMPs from data)</li> </ul>	
<b>Data Recorded</b>	Number of full inspections (Outcome Level 1)	22
	Number of facilities recommended for follow-up (Outcome Level 1)	7
	Number of Sites Needing Corrective Action (Outcome Level 1)	22
	Number of Sites that Implemented Some Corrective Action During Inspection (Outcome Level 3)	2
	Number of Sites with Source Abatement (based on corrective actions taken) (Outcome Level 4)	2
	Total IC/IDs Observed (Outcome Level 1)	0
	Total IC/IDs Eliminated During Inspection (Outcome Level 1)	N/A

**Conclusions**

This activity fulfills the requirement of one of the two required watershed water quality activities for this watershed management area.

As a result of this activity, the City noted deficiencies at the facilities and made recommendations to the responsible parties at 22 sites. Additionally, the City noted 7 sites that needed to follow-up to verify that corrective actions/BMPs were implemented. However, the City can verify that at 2 locations, corrective actions were immediately taken. This demonstrates both a Level 3 (change in behavior/BMP implementation) and Level 4 (source abatement/load reduction) outcome was achieved as a direct result of this activity.

The City plans to implement the program in FY2010 to more obtain more data necessary to answer the management questions associated with the program activity.



**TITLE: Municipal Rain Barrel Installation and Downspout Disconnect Project**  
**ID NUMBER: TJ-009**

### **ACTIVITY IMPLEMENTATION**

The City of San Diego (City) is undertaking a municipal rain barrel installation and downspout disconnect project to reduce pollutant loading at municipal facilities. The municipal rain barrel installation and downspout disconnect project will consist of installing rain barrel systems, including downspout disconnects and infiltration systems, within the Tijuana River Watershed Management Area (WMA) to reduce pollutant loading from urban runoff during storm events. Rain barrels and downspout disconnects help to capture, store and divert storm water to reduce urban runoff, thus contributing to reduced flooding, erosion and the contamination of surface water with sediments, fertilizers, metals, pesticides and other urban runoff pollutants. Rain barrels collect storm water runoff from buildings and residential rooftops and store until discharged. Rain barrels can be connected to a slow-release, gravity-powered landscaping irrigation system in which the stored runoff is released to landscaped areas for irrigation purposes. These landscaped areas can be designed to promote pollutant load reduction using bioretention, bioswales and other Low Impact Development (LID) techniques. These areas can also be designed as lined planter boxes, swales and filtration systems that keep runoff away from existing structures and utilities.

Downspout disconnects are an additional option for redirecting runoff from roof areas to landscaped areas or constructed planter boxes, swales or filtration systems. The project will investigate the effectiveness of rain barrels/downspout disconnects in reducing pollutant loading and will assist the City in attaining its water quality goals. The project includes site evaluations and selections, the purchase of rain barrel/downspout disconnect systems and planter boxes, system installation, wet-weather monitoring, and effectiveness assessments.

In order to select appropriate sites for this pilot project, the City used the prioritization process outlined in its *Strategic Plan for Watershed Activity Implementation* to target high priority areas within the Tijuana River WMA. The site selection process was long and iterative. Field reconnaissance was required to identify sites within the Tijuana River WMA with adequate roof gutters, downspouts, and locations where rain barrels would be installed to capture flow. Sites were assessed for sources of electrical power for use with automated systems and for adjacent vegetated areas where captured water could be discharged. Sites were also selected for education/outreach opportunities.

Based on the prioritization plan and field reconnaissance, the San Ysidro Library was selected because it is located in one of the highest priority sectors of the Tijuana River WMA for potential pollutant loading. The recreation center is also a publically accessible City facility, making education and outreach opportunities easily implementable.

In April 2009, a City-approved contractor installed two rain barrel systems at the library. One 55-gallon rain barrel was installed and connected to an existing downspout directly adjacent to the main entrance of the library. This system utilizes a gravity release mechanism to deliver captured runoff to nearby landscaping. In addition, one 75-gallon

rain box was installed and connected to an existing downspout along the back side of the building. This system will also use a gravity release mechanism to deliver captured water to nearby landscaping.



**Rain Barrel at front entrance**



**Rain Box**

A one page informational flyer regarding the rain barrel pilot project was developed in June 2009. The flyer will be distributed to all participating municipal sites to be made available to the public. In addition, a brief description of the pilot project and a PDF version of the informational flyer will be posted on the City's *Think Blue* website during the first quarter of FY 2010.

This phase of the pilot project focuses on implementing and assessing the effectiveness of rain barrel/rain harvesting systems at selected municipal facilities. Ultimately, the City would like to incorporate the use of these LID techniques through a residential program that may include incentives for implementing these systems. Therefore, it is anticipated that the information gathered during this phase of the pilot project will be applied to implementation in residential areas.

Based on these findings, the City may modify its municipal rain barrel installation and downspout disconnect project to increase effectiveness and/or seek City Council approval for additional funding to implement future phases (i.e., incentives) and additional rain barrel/downspout disconnect systems.

### **TMDL APPLICABILITY**

- None

### **TIME SCHEDULE FOR IMPLEMENTATION**

Project planning, including site selection, began in July 2007 and was completed by the first quarter of FY 2008. Initially, the project was scheduled for completed by the fourth quarter of FY 2008. However, planning, site selection, and procurement of the rain barrels took longer than expected. Product screening for the rain barrels and concrete planters was completed in the first quarter of 2008. Procurement of rain barrels, planter boxes and rain chains concluded by the second quarter of 2009. The installation contract was awarded and approved by City Council during the second quarter of FY 2009. A

pre-construction meeting was held with the contractor in March 2009. Installation of all systems occurred in April 2009. Wet-weather monitoring will be performed from October 2009 to April 2010. Assessment and final reporting for this program will conclude by June 2010.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City’s *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Tijuana River WMA identify bacteria as a high priority water quality problem, and recommend implementing load reduction/source abatement activities to address it. Implementation of this activity will address both high priority water quality problems by reducing runoff volume via capture, retention and infiltration.

**EFFECTIVENESS ASSESSMENT**

<b>MUNICIPAL RAIN BARREL INSTALLATION PROGRAM</b>		
<b>Assess the Efficiency and Effectiveness of Rain Barrel Water Collection Containers at Reducing Runoff</b>		
<b>Management Questions</b>	<ul style="list-style-type: none"> <li>• What is the effectiveness/efficiency of rain barrel/rain-harvesting systems in reducing storm water runoff volume?</li> <li>• What is the loading reduction of different systems?</li> <li>• Which system is most efficient in collecting and/or diverting rainwater?</li> <li>• Which system results in the largest load reductions?</li> </ul>	
<b>Targeted Measurable Outcome(s)</b>	<ul style="list-style-type: none"> <li>• Load reduction due to rain barrel installation</li> <li>• Runoff reduction due to rain barrel installation</li> </ul>	
<b>Data Recorded</b>	Cost of site preparation, installation and start-up for the site	TBD
	Cost of operation and maintenance evaluation for all sites	TBD
	Cost of effectiveness monitoring for all sites	TBD
<b>Recommended Data</b>	<ul style="list-style-type: none"> <li>• Number/type of barrels installed (Outcome Level 1)</li> <li>• Volume of storm water captured/diverted (Outcome Level 4)</li> <li>• Concentrations of COCs in rainwater or runoff (measured in rain barrel systems) (Outcome Level 4)</li> <li>• Percent capture of the different systems (acres drained) (Outcome Level 4)</li> </ul>	

**Objectives**

The goal of the rain barrel and rain harvesting assessment is to determine whether rain barrel/rain-harvesting systems reduce storm water runoff, thereby reducing metals and bacteria loads, and if so which system is most effective and efficient.

**Analysis and Results**

The pilot project was not in active implementation during FY 2009. Further analysis will take place after wet-weather monitoring data is collected, which is scheduled for completion by April 2010.

**Conclusions**

Effectiveness and efficiency will be determined by comparing load reduction values (determined via monitoring efforts) versus the cost of installing and maintaining the rain barrel system. Conclusions will be made after the effectiveness assessment is completed in June 2010. Any recommendations resulting from this pilot project will be reported in the FY 2010 WURMP Annual Report.

**TITLE: City-Wide Clean-Up Events**  
**ID NUMBER: TJ-010**

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### **ACTIVITY IMPLEMENTATION**

Imperial Beach participates in a number of city-wide sponsored clean-up events including ILACSD Creek-to-Bay clean up, local community group sponsored events, and the annual Home Front Clean-Up event. The largest event in terms of participation is the annual Home Front Clean-Up, which the City has been implementing since the 2001-01 municipal permit. These annual City-wide activities serve both as an encouragement and a means for residents to eliminate waste that could otherwise contribute the release of contaminants into the storm water conveyance system.

### **TMDL APPLICABILITY**

This activity is not specifically targeted for TMDLs in the Tijuana WMA.

### **TIME SCHEDULE FOR IMPLEMENTATION**

City-wide clean up events will continue to be held throughout the duration of Municipal Permit R9-2007-0001. The City intends to sponsor ILACSD for the annual Creek-to-Bay clean up and continue the highly successful City-wide Home Front Clean Up event for the complete cycle of the current permit. The activity will be assessed and refined as necessary during years 3 and 4.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of Imperial Beach

### **OTHER PARTICIPATING ENTITIES**

- EDCO Waste and Recycling Services

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Bacteria are identified as a priority water quality problem in the Tijuana WMA. The accumulation of waste by residents such as trash, green waste, and large bulky items are potential sources of bacteria. Since this activity addresses a priority water quality problem and a priority source, it is consistent with the collective watershed strategy.

### **EXPECTED BENEFITS**

Expected benefits of implementing City-wide clean-up activities include compliance with permit requirements, changes in attitudes, knowledge, and awareness of the community, and lead to reductions in urban runoff and discharge quality by removing wastes that may have otherwise ended up in the storm drain system. City-wide clean-up events serve both as education and water quality activities. Reducing the amount of trash in the storm drain system also has the co-benefit of reducing bacteria which is identified as a water quality problem in the Tijuana WMA.

### **EFFECTIVENESS MEASUREMENTS**

The effectiveness of this project meets the requirements of Outcome Level 1, Level 2, and Level 4 compliance with activity based permit requirements. Community wide clean-up events raise awareness of the connectivity of trash, urban runoff, storm drain systems, and receiving waters.

During FY 2008-09 Imperial Beach sponsored I Love a Clean San Diego for its 7<sup>th</sup> Annual Creek-to-Bay clean up event on April 25<sup>th</sup>, 2009. The City also held its annual Home Front clean up event on May 2<sup>nd</sup>, 2009. The Home Front clean up event had 732 participants and resulted in the proper disposal of 154.3 tons of waste including 19.8 tons of metals and 9.5 tons of green waste that were recycled.

**TITLE: Large Special Event Inspection and Clean-Up**  
**ID NUMBER: TJ-011**

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### **ACTIVITY IMPLEMENTATION**

The City hosts the annual U.S Open Sandcastle Competition that draws close to one million visitors to Imperial Beach in the month of July. The City also hosts additional special events during the year that draw a large number of visitors to the City. Along with the visitors are a number of mobile businesses, food vendors, and increased volume of trash that can potentially contribute to the problem of urban runoff. Starting in 2008 the City enhanced its special event application process to further target urban runoff and recycling during the planning and implementation stages for the special event. Program enhancements include providing storm water education for street vendors, providing education for the general public whenever possible, and inspections of street vendors for storm water violations. The City also enhanced its recycling and trash collection service for the Annual U.S. Open Sandcastle Competition.

### **TMDL APPLICABILITY**

This activity is not specifically targeted for TMDLs in the Tijuana WMA.

### **TIME SCHEDULE FOR IMPLEMENTATION**

Implementation of the activity has begun under the previous storm water permit 2001-01 and since been reviewed and enhanced for the new R9-2007-0001 permit. The City endeavors to increase recycling and urban runoff education targeted at both street vendors and general public at large special events. During the previous two years the activity was in active implementation phase. Starting during year 3 the activity will be assessed and refined as necessary to maximize the effectiveness.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of Imperial Beach

### **OTHER PARTICIPATING ENTITIES**

- EDCO Waste and Recycling Services

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Bacteria are identified as a priority water quality problem in the Tijuana WMA. The increased number of visitors, larger volumes of waste, and water quality threat from mobile food vendors during large special events are potential sources of bacteria and urban runoff pollution. Since this activity addresses a priority water quality problem and a priority source, it is consistent with the collective watershed strategy.

### **EXPECTED BENEFITS**

Expected benefits of enhancing large special event clean up and inspections include compliance with permit requirements, changes in attitudes, knowledge, and awareness of mobile businesses and local community, and reductions in urban runoff and discharge quality by enhancing recycling efforts and implementing storm water BMPs. This activity serves as both an education

and water quality activity. Enhancing recycling efforts, increasing education on urban runoff, and verifying the implementation of BMPs through inspections may lead to lower levels of bacteria and trash reaching the storm drain system.

### **EFFECTIVENESS MEASUREMENTS**

The effectiveness of this project meets the requirements of Outcome Level 1, Level 2, and Level 4 compliance with activity based permit requirements. Community wide clean-up events raise awareness of the connectivity of trash, urban runoff, storm drain systems, and receiving waters.

During FY 2008-09 Imperial Beach required the proper disposal of recycled waste at all large special events and the implementation of storm water BMPs when appropriate. During the year the City held 12 large special events requiring conditions for storm water BMPs and recycling from the Public Works Department. The largest of these events was the annual U.S. Open Sandcastle Competition, which during the weekend of July 12<sup>th</sup>-13<sup>th</sup> drew an estimated crowd of over 800,000 visitors to the beach. In preparation for the U.S. Open Sandcastle event the City provided additional storm water BMP information to all street vendors before the event and then followed up with storm water inspections during the event, which resulted in 3 Notices of Violations. The City also enhanced its recycling efforts at the Sand Castle Competition by sponsoring a local Baptist Church group who worked with the City to enhance its recycling program implementation during the event. The recycling efforts resulted in a total of 1280 pounds of mixed recyclables and 960 pounds of cardboard being recycled.

As a result of the effectiveness assessment of this activity, the City recognizes a deficiency in education opportunities for the general public. Future efforts will continue implementing the existing large special event clean up and inspection activities while continuing to enhance the opportunities for education, especially for the general public. Program effectiveness for targeting water quality is expected to continually improve as special event applicants and vendors become familiar with City storm water and recycling programs.

**TITLE:** Smuggler's Gulch Sediment and Debris Removal  
**ID NUMBER:** TJ-012

**ACTIVITY DESCRIPTION**

The County performs routine flood control maintenance activities on improved and unimproved channels pursuant to its Regional General Permit (RGP) 53. This activity is traditionally performed every two to four years depending on annual rainfall. The extent of the project includes the channel from the Mexican border, north approximately 5,400 feet to the confluence of the Tijuana River. Historically as much as 80,000 cubic yards of sediment can be removed from the channel. Trash is separated on site and recycled accordingly.

The sediment removal project is necessary to return the drainage facility to historic conditions and to convey flow properly, which will eliminate the potential for sediment and debris to build up causing future flooding events.

**ACTIVITY IMPLEMENTATION 2007-08**

There were no sediment and debris removal during the FY2007-08.

**ACTIVITY IMPLEMENTATION 2008-09**

There were no sediment and debris removal during the FY2008-09.

**TMDL APPLICABILITY**

N/A.

**TIME SCHEDULE FOR IMPLEMENTATION**

Typically removal takes place every other year but is based on precipitation patterns and erosion from the south. Dredging is planned for FY2009-10.

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- California Department of Fish and Game
- California State Parks

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Sediment
- Trash

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Sediment and trash have been identified as high priority water quality problems in the Tijuana River WMA. This activity results in a direct load reduction of these pollutants, and is therefore consistent with the collective watershed strategy.

**EFFECTIVENESS ASSESSMENT**

This activity is considered a load reduction that can be measured. On an annual basis or as implementation occurs during the permitting period, the cubic yards of removal will be reported in the Tijuana River WMA WURMP Annual Report.



**TITLE: TIJUANA RIVER WATERSHED BACTERIAL SOURCE IDENTIFICATION STUDY**

**ID NUMBER: TJ-013**

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**ACTIVITY IMPLEMENTATION**

The City of Imperial Beach initiated a Bacteria Source Identification study in November 2007 to identify and quantify sources of bacterial contamination in the U.S. portion of the Tijuana River Watershed. Unfortunately, the City was notified December 15, 2008 that the funding was on hold due to the state budget crisis. In June 2009 the project still had not received assurance from the state on the restoration of the CBI grant funds and the project was permanently put on hold until additional funding could be secured.

Once funding for the project is made available, work can be resumed and build upon the existing accomplishments of the Bacterial Source Identification Study to date. During this reporting period the Bacterial Source Identification Study accomplished the following tasks:

- Established a stakeholder group and held two meetings
- Completed a literature review and Quality Assurance Project and Monitoring Plans for the project
- Conducted field reconnaissance throughout the watershed and identified appropriate sampling locations
- Collected water quality samples for one sanitary survey and captured one wet weather storm event
- Collected preliminary flow measurement for the hydrologic component of the study

**TMDL APPLICABILITY**

While it may be supportive of TMDL goals, this activity is not specifically applicable as part of a TMDL compliance program.

**TIME SCHEDULE FOR IMPLEMENTATION**

The project is currently on hold until funding from the CBI Grant is made available or additional funding from another source can be secured. If and when funding for the project is restored, the City may rescind the stop work notice for the project and resume work on the Bacterial Identification Study. At which time the scope and terms of the initial agreement will need to be revisited to account for the work completed to date, the effects from schedule modifications, and start up costs to get the study running again.

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego
- City of San Diego
- City of Imperial Beach

**OTHER PARTICIPATING ENTITIES**

- State Water Resources Control Board
- Clean Beaches Initiative Task Force
- Regional Water Quality Control Board, San Diego
- U.S. Fish and Wildlife Service
- International Boundary and Water Commission (IBWC)

- California Department of Fish and Game
- Private land owners
- Conservation groups
- NGOs
- National Oceanic and Atmospheric Administration (NOAA)
- Tijuana River National Estuarine Research Reserve (TJNERR)

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Bacteria are identified as a priority water quality problem in the Tijuana River Watershed. Trash, parks, and pet waste are potential sources of bacteria. Since this activity addresses a priority water quality problem and a priority source, it is consistent with the collective watershed strategy.

### **EXPECTED BENEFITS**

There are limited data regarding bacterial loads from sources and activities on the U.S. side of the Tijuana River Watershed (TRW). In addition, detailed information regarding the impact of certain land uses, and the input of pollutants from point and nonpoint sources have not been assessed for the U.S. portion of the TRW. This study aims to quantify bacterial loads from potential sources and propose solutions to reduce the impact of bacterial loads in the TRW and Pacific Ocean. The implementation of successful best management practices will result in a reduction in beach postings and closures.

### **EFFECTIVENESS MEASUREMENTS**

The effectiveness of this project meets the requirements of Outcome Level 1 compliance with activity based permit requirements. Information gained from this study will help in developing other programs that will further address changes in knowledge and behavior, load reductions, and improvements to water quality. Funding for the project was cut short before any analysis or conclusions could be drawn on the data collected from the first sanitary survey and wet weather storm event. Further effectiveness assessment is contingent upon funding for the project.

**TITLE: LID and Watershed Planning Education for Community Planning and Sponsor Groups**

**ID NUMBER: TJ-014**

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### **ACTIVITY DESCRIPTION**

This activity involves educating local planning and sponsor groups throughout the unincorporated County on low impact development (LID) and watershed planning principles, practices, and requirements. These groups act in an advisory capacity to local decision makers on a variety of issues, primarily discretionary planning projects. Because their input is valuable to the discretionary process, it is important that they have a strong understanding of regulations and guidelines that may affect the way watersheds are developed. Ultimately, the recommendations of local planning and sponsor groups have some influence over whether, and under what conditions, development projects are approved. LID and watershed planning education will aid local planning and sponsor groups in making informed recommendations on aspects of development projects that would affect watershed water quality.

During training, members of the planning or sponsor groups are provided with copies of the LID Handbook, including Management Strategies, the Appendices, and the Literary Guide. Advisory groups and audience members who wish to participate are given a pre- and post-survey to assess their general knowledge of watershed planning and LID both before and after the presentation. The training sessions average fifty minutes depending upon the amount and type of questions that are asked during the presentation.

Local planning and sponsor groups that received training within the Tijuana River Watershed during the FY 2008-2009 timeframe include those listed below. One tribe, the Manzanita band of Kumeyaay Nation, also participated at their request. However, because they are not subject to the permit and LID requirements, no pre- and post- survey was given.

- Lake Morena / Campo (11/24/2008)
- Potrero (10/9/2008)
- Boulevard (2/5/2009)
- Descanso (9/18/08)
- Cuyamaca (12/9/08)
- Pine Valley (10/14/2008)
- Alpine (1/22/2009)
- Jamul / Dulzura (3/24/2009)
- Manzanita Tribe (6/11/09)

### **ACTIVITY IMPLEMENTATION FY 07-08**

This education program was successfully developed during the spring of FY 2007-2008, on schedule. The program consists of a PowerPoint presentation with a specific focus on the watershed(s) within which the community lies. Although County staff began conducting presentations to planning and sponsor groups in other watersheds during FY 2007-08, none were conducted in the Tijuana River Watershed.

### **ACTIVITY IMPLEMENTATION FY 08-09**

As documented in the table below, presentations were delivered to eight planning and sponsor groups in the Tijuana River Watershed, which included 143 attendees. A total of 78 pre- and post- surveys were completed by these groups.

**TITLE: LID and Watershed Planning Education for Community Planning and Sponsor Groups**

**ID NUMBER: TJ-014**

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<b>Community Group</b>	<b>Presentation Date</b>	<b>No. Of Attendees</b>	<b>Surveys Completed</b>
Alpine	1/22/09	27	15
Boulevard	2/5/09	15	8
Cuyamaca	12/9/08	7	5
Descanso	9/18/08	10	10
Jamul/Dulzura	3/24/09	9	8
Lake Morena / Campo	11/24/08	35	8
Manzanita Tribe	6/11/09	12	0
Pine Valley	10/14/08	15	13
Potrero	10/9/08	13	11
<b>Total</b>		<b>143</b>	<b>78</b>

**TMDL APPLICABILITY**

This activity is not specifically implemented in compliance with a TMDL.

**TIME SCHEDULE FOR IMPLEMENTATION**

This activity was completed during FY 2008-09. There is currently no further activity planned for future years.

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- All

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

New development has been identified as having potentially significant impacts on watershed health. As such, this activity is consistent with the collective watershed strategy.

**EFFECTIVENESS MEASUREMENTS**

Activity effectiveness was assessed by tracking the number of presentations conducted, the number of participants in attendance, and the number and type of materials distributed (Level 1 Outcomes). Furthermore, attendees were asked to complete pre- and post- survey forms, which consisted of five multiple choice questions and one open answer section which asks the participant to provide information on drainage within the community planning area. Survey results were calculated to measure changes in attendee knowledge regarding watershed planning and LID principles (Level 2 Outcome).

The table below summarizes results from the 8 surveys administered to groups in the Tijuana River Watershed. Improvements on the post- survey ranged from a 2.67% increase to a 32.5% increase. This represents a demonstrable increase in knowledge among the target audience.

**TITLE: LID and Watershed Planning Education for Community Planning and Sponsor Groups**

**ID NUMBER: TJ-014**

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<b>Community Group</b>	<b>Date</b>	<b>Total Attendees</b>	<b># of Surveys Given</b>	<b>Pre-survey % correct</b>	<b>Post-survey % correct</b>	<b>% Increase</b>
Alpine	1/22/09	27	15	65.33%	68%	2.67%
Boulevard	2/5/09	15	8	60%	77.5%	17.5%
Cuyamaca	12/9/08	7	5	76%	88%	12%
Descanso	9/18/08	10	10	82%	88%	6%
Jamul/Dulzura	3/24/09	9	8	75%	92.5%	17.5%
Lake Morena / Campo	11/24/08	35	8	52.5%	85%	32.5%
Manzanita Tribe	6/11/09	12	0	N/A	N/A	<i>No Survey</i>
Pine Valley	10/14/08	15	13	53.85%	83.08%	29.23%
Potrero	10/9/08	13	11	69.09%	80%	10.91%



**TITLE:** Public Service Announcement: Karma, Karma Second Chance, Karma Tourist  
**ID NUMBER:** TJ-015

**ACTIVITY IMPLEMENTATION**

The City of San Diego (City) retained a contract with a film production company to create three *Think Blue* Public Service Announcements (PSAs) specifically focused on bacteria, with gross pollutants (trash) profiled as a vector. The PSAs are entitled *Karma*, *Karma Second Chance*, and *Karma Tourist* and the goal of the PSAs is to educate the public about causes of pollution and to encourage positive behavioral change.

The PSA used humor to convey the importance of the public's part in the proper disposal of trash and the impacts litter and pollution have on our waterways and beaches. The PSAs were broadcast in both English and Spanish.

**TMDL APPLICABILITY**

- None

**TIME SCHEDULE FOR IMPLEMENTATION**

The PSAs were developed in FY 2007 and FY 2008 and were broadcast on several TV and radio stations throughout the Tijuana River Watershed Management Area (WMA) during FY 2009 from August 2008 to April 2009. The City will work with various broadcast media outlets to distribute and air the PSAs during FY 2010.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

**OTHER PARTICIPATING ENTITIES**

- Various Television and Radios Stations in San Diego

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria
- Gross Pollutants (Trash)

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Tijuana River WMA identify bacteria as high priority water quality problems in the Tijuana River WMA. The *Karma*, *Karma Second Chance*, and *Karma Tourist* PSAs will result in both increased knowledge and awareness regarding bacteria and trash as a vector and future load reduction of trash and debris directly and of bacteria indirectly.

**EFFECTIVENESS ASSESSMENT**

<b>Watershed: Tijuana River</b>									
<b>PUBLIC SERVICE ANNOUNCEMENT: KARMA, KARMA SECOND CHANCE, KARMA TOURIST</b>									
<b>Assess the Efficiency and Effectiveness of Public Service Announcements</b>									
<b>Management Questions</b>	<ul style="list-style-type: none"> <li>• What changes in awareness/attitude regarding bacteria and gross pollutants was achieved after implementation?</li> <li>• How efficient is this education activity based on total cost versus number of people (targeted audience) reached?</li> </ul>								
<b>Targeted Measurable Outcome(s)</b>	<ul style="list-style-type: none"> <li>• Reach goal of number of listeners (radio) and homes (television) reached, based on survey results</li> <li>• Increased level of knowledge/attitude based on post-activity surveys</li> </ul>								
<b>Assessment Method(s)</b>	<ul style="list-style-type: none"> <li>• Survey (e.g., administer survey to assess knowledge and attitude of participants)</li> <li>• Quantification (e.g., number of residents reached by PSA)</li> </ul>								
<b>Data Recorded</b>	<table border="1" style="width: 100%;"> <tr> <td>Number of impressions made in homes through television in Tijuana River WMA (Outcome Level 1)</td> <td style="text-align: center;">446,835</td> </tr> <tr> <td>Number of impressions made to the public through radio announcements in Tijuana River WMA (Outcome Level 1)</td> <td style="text-align: center;">613,459</td> </tr> <tr> <td>Change in knowledge or attitude from survey results (Outcome Level 2)</td> <td style="text-align: center;">44%</td> </tr> <tr> <td>Change in pollutant-related behavior from survey results (Outcome Level 3)</td> <td style="text-align: center;">Yes**</td> </tr> </table>	Number of impressions made in homes through television in Tijuana River WMA (Outcome Level 1)	446,835	Number of impressions made to the public through radio announcements in Tijuana River WMA (Outcome Level 1)	613,459	Change in knowledge or attitude from survey results (Outcome Level 2)	44%	Change in pollutant-related behavior from survey results (Outcome Level 3)	Yes**
Number of impressions made in homes through television in Tijuana River WMA (Outcome Level 1)	446,835								
Number of impressions made to the public through radio announcements in Tijuana River WMA (Outcome Level 1)	613,459								
Change in knowledge or attitude from survey results (Outcome Level 2)	44%								
Change in pollutant-related behavior from survey results (Outcome Level 3)	Yes**								

\*\*29% of residents reported making a change in their behavior as a result of seeing information about what polluted water in storm drains does to local rivers, beaches and the ocean. Of those residents that had heard of “Think Blue” 40% reported that they were taking steps to change behaviors. There was also a continued decrease in the percentage of residents who reported hosing down their driveways, as well as using pesticides and weed killers. Other decreases in pollutant-related behavior were percentages too small to fall within the acceptable range for statistical outcomes at a 95% confidence level. For those behaviors, the percentages of change were so small that they cannot be assumed to be a result of the activity based on this year’s survey and method of assessment.

**Objectives**

The goal of this assessment is to determine the effectiveness of the *Karma*, *Karma Second Chance*, and *Karma Tourist* PSAs in educating the public about the causes of bacteria and trash loading, and to encourage positive behavioral change.

**Analysis and Results**

The city conducted an effectiveness assessment of *Think Blue* PSAs and storm water messages via field experiment in which 309 individuals were shown eight different *Think Blue* PSAs (including the *Karma*, *Karma Second Chance* PSAs). Participants were then asked questions to determine storm water knowledge, awareness and possible changes to future behavior as a result of the PSA. The results of the field experiment demonstrate the messages in the PSAs are effective in increasing public knowledge that storm water is not treated. 25% of participants were more likely to answer that storm water is not treated than those who had answered the question prior to watching the PSA. Additionally, awareness that storm water pollution is an important issue in San Diego also increased after watching the PSA. Lastly, the *Karma Second Chance* PSA scored the highest of the PSAs in motivating participants to take specific actions to prevent storm water pollution.

The city also obtained assessment information from its annual random-digit dial 2009 *San Diego Storm Water Survey* of 800 total residents from all WMAs. 55% of residents said they saw a *Think Blue* PSA last year (up from 52%) on television while 8% of residents heard the radio announcements in FY 2009. 51% said they prefer to get information about storm water via

television. This year's survey also noted that while 44% of residents know that storm water was not treated, significant increases in awareness were detected among women (particularly over the age of 50), residents under the age of 35 and over 64, those with no college education, Asians and Hispanics. Additionally, 29% of residents reported making a change in their behavior as a result of seeing information about what polluted water in storm drains does to local rivers, beaches and the ocean. Of those residents that had heard of "Think Blue" 40% reported that they were taking steps to change behaviors as well.

Respondents to the survey were selected randomly in order to fairly and accurately represent the city as a whole. To estimate the number of impressions in the Tijuana River WMA, the total number of estimated city-wide impressions, (11,170,888 for television and 15,336,488 for radio ads) was multiplied by the proportion of residents living in the Tijuana River WMA (4%) of the city's total population.

### **Conclusions**

Based on assessment from both the survey and the field experiment as well as feedback from the public, *Think Blue* PSAs appear to have an impact on the public as it pertains to knowledge and awareness of storm water issues. While some residents have stated they have made changes to their behaviors due in part to the PSAs, the city will continue to monitor public perception and feedback to determine if this is actually occurring. The city will continue to work with appropriate broadcast media outlets to air *Think Blue* television and radio PSAs in FY 2010.

Additionally, the city continued to measure public awareness of the *Think Blue* program via surveys comprised of a random digit dial sample of the residents living in the Tijuana River WMA to determine whether this activity results in a change in knowledge and awareness associated with storm water issues, or results in a change in pollution-related behavior. Efficiency will be calculated by comparing measurable changes in knowledge, awareness and/or change in behavior with the cost of this activity.

Furthermore, while the *2009 San Diego Storm Water Survey* indicated that 39% had heard the phrase "Think Blue" during FY 2009, awareness that storm water is not treated increased. These results, coupled with a continued decrease in the percentage of residents hosing down their driveways, and in residents using pesticide or weed killers, demonstrate that the public's knowledge of storm water issues is moving in a positive direction.

It is worth noting that the City's PSAs continue to reach new individuals in the Tijuana River WMA, as evident by the estimated number of individual impressions from television and radio announcements watershed-wide. Although a direct, statistical correlation is not clear, the number of impressions and the results of the random survey indicate that this activity is effective in reaching residents and disseminating information to raise knowledge, awareness and/or create a change in behavior regarding storm water issues. This activity will continue in future fiscal years with the hopes that a long-term assessment will provide more complete results.



**TITLE: Mobile Advertising**  
**ID NUMBER: TJ-016**

**ACTIVITY IMPLEMENTATION**

The City of San Diego (City) retained a contract with a mobile advertising firm, AdTruks, to advertise Think Blue messages on static billboard trucks in the Tijuana River Watershed Management Area (WMA) in FY08. The City created advertisements that targeted behaviors associated with bacteria and trash. The goal of mobile advertising was to educate the public about the impacts litter and pollution have on local waterways and beaches and to encourage positive behavioral change.

Based on results from the 2009 Storm Water Survey in which 17% of participants stated they received Think Blue messages via mobile advertising, it was determined that the program was not as effective in generating sufficient knowledge and awareness of the program or storm water issues. Additionally, the Department received a number of public comments objecting to the use of mobile advertising to convey an anti-pollution message. Therefore, the city did not conduct mobile advertising in the Tijuana River WMA in FY09, and has discontinued this activity.



**TITLE: Invasive Species Removal Project in the Tijuana River Park**  
**ID NUMBER: TJ-017**

### **ACTIVITY DESCRIPTION**

The SANDAG Transnet Environmental Mitigation Program (EMP) funded a grant to the Southwest Wetlands Interpretive Association (SWIA) to continue the Tijuana River Valley Invasive Plant Control Program (Phase IV) begun in 2002 in the extreme southwest part of San Diego County within a few miles from the mouth of the river. The program includes work in the County of San Diego's Tijuana River Valley Regional Park (TRVRP), California State Parks' Border Field State Park, and the U.S. Fish and Wildlife Services' Tijuana Estuary. Three invasive plant species are targeted within the Tijuana River Valley: giant reed (*Arundo donax*), castor bean (*Ricinus communis*) and salt cedar (*Tamarix ramosissima*). These species degrade the habitats they invade by displacing native vegetation, lowering insect food supply for birds, reducing groundwater, and increasing flood and fire hazards. The invasive removal program includes replanting with native species, a project that, coupled with natives returning naturally, will serve to filter pollutants and decrease sedimentation in the long term. The County cooperated with the SWIA in seeking grants, by writing letters of support and serving on a technical advisory group (TAG) for the program. In the implementation of the program, the County continues to serve on the TAG and provides SWIA with right-of-entry permits to County property. SWIA is committed to seeking grants for the on-going funding of this project and the County plans to continue its long-term cooperation with the association.

### **ACTIVITY IMPLEMENTATION FY2007-08**

The following tasks were implemented as part of invasive plant removal program in the Tijuana River Valley Regional Park:

- Treated arundo and castor bean on 100 acres;
- Performed follow-up treatment of arundo and castor bean on old 511 acres;
- Treat tamarisk on 61 acres around Dairy Mart ponds;
- Maintained and planted native cuttings.
- Attended TAG meeting and provided right of entry letters to SWIA.

### **ACTIVITY IMPLEMENTATION FY2008-09**

The following tasks were implemented as part of invasive plant removal program in the Tijuana River Valley Regional:

- The County participated in the annual TAG meeting, held July 20, 2008. The continued success of the program and the information disseminated through the TAG meetings has resulted in the signing of a "Declaration of Intent" by all public landowners in the Tijuana River Valley that acknowledges the problem of invasives and their commitment to support continuing efforts to control these species.

### **TMDL APPLICABILITY**

N/A.

### **TIME SCHEDULE FOR IMPLEMENTATION**

Phase IV, scheduled for Fall 2009 through Spring 2010, will enhance and restore prime riparian and mule fat habitats within 75.5 acres of the County of San Diego Tijuana River Valley

Regional Park. The goals are to improve these valuable sites for visitors, control the spread of invasive plants and restore native habitats. Additional funding provided by USFWS will provide treatment and revegetation to 31 acres within the U.S. Fish and Wildlife Services Tijuana Estuary. Treatment and planting is scheduled to start in October 2009.

#### **PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

#### **OTHER PARTICIPATING ENTITIES**

- Southwest Wetlands Interpretive Association,
- U.S. Fish & Wildlife Service,
- California State Parks

#### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Sediment
- Pesticides
- Bacteria

#### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Sediment, pesticides, and bacteria are high priority water quality problems in the Tijuana River WMA. Therefore, this activity is consistent with the collective watershed strategy.

#### **EFFECTIVENESS ASSESSMENT**

Activity effectiveness will be measured by ensuring completion of all project elements (Level 1). Each invasive plant area will be monitored to determine which control methods would be most effective in the TJRV. Although no water quality monitoring is proposed for this project, water quality improvements may be able to be assessed qualitatively based on results from similar projects.

**TITLE: Tijuana River and Estuary Trash and Sediment Characterization Study**  
**ID NUMBER: TJ-018**

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### **ACTIVITY DESCRIPTION**

Trash and sediment deposition in the Tijuana River and Estuary continue to threaten public health, safety, and the environment throughout the Tijuana River Valley. Public contact with trash, waste tires, and other solid wastes, including contaminated soil and sediments, is potentially injurious to human health. Moreover, excessive sedimentation has in recent years contributed to the loss and impairment of valuable estuarine habitat. Past efforts have removed some of the trash and sediment; however, they have been insufficient to address the entire area. The extent of trash and sediment deposition has not been adequately characterized to date and comprehensive alternatives to solve the problem remain elusive.

The objective of this project is to characterize trash and sediment in the Tijuana River and Estuary and to identify comprehensive remediation alternatives for removing existing trash and sediment deposition. The County and City of San Diego are partnering with the San Diego Regional Water Quality Control Board, the California Integrated Waste Management Board (CIWMB), and other stakeholders to complete this study.

As a first step, a consultant was retained to characterize trash and sediment in the Tijuana River and Estuary and to prepare a workplan to identify remediation alternatives for removing existing trash and sediment deposition. The following tasks and deliverables are scheduled to be completed no later than June 15, 2009 at a cost not to exceed \$100,000.

#### Task 1: Inventory of Existing Information and Field Reconnaissance

- Research and review plans and pertinent studies.
- Research topographic maps to determine boundaries of the River and Estuary
- Conduct field investigation and take digital photos of the existing trash and sediment depositions.
- Determine the extent of the existing trash, waste tires, and sediment deposition in the river, estuary, and tributaries.
- Geo-reference location of trash, waste tires, and sediment depositions
- Quantify the depth, width, and length of the trash, waste tires, and sediment deposition.

#### Task 2: Digitize/Compile Existing Information

- Prepare orthophoto base maps with the existing trash, waste tires, and sediment information.
- Import from the County of San Diego GIS database information such as land use classifications, soil groups, and transfer into project database.

#### Task 3: Characterization

- Determine the types and quantities of trash in the deposition. Develop a matrix showing the general types of trash and the disposal methods.
- Determine the amount of sediment in the deposition.
- Determine the amount of recyclable materials that can be recovered from the deposition.
- Determine the amount of waste tires in the deposition.
- Determine the viability of recycling sand.
- Plot percentage of trash versus sedimentation on the base map.

**TITLE:** Tijuana River and Estuary Trash and Sediment Characterization Study  
**ID NUMBER:** TJ-018

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#### Task 4: Analyze Alternatives

- Develop alternatives for removing existing trash, waste tires, and sediment deposition. Consider alternatives that do not require cross-border solutions.
- Consider the following in developing the alternatives:
  - Cost to haul to landfill
  - Temporary or Permanent Transfer Station
  - Segregating recyclables
  - Segregating sand
  - Waste tire recycling and disposal
- Include cost to restore river, tributary, and estuary to natural condition.
- Develop cost estimate for various alternatives.
- Determine the viability of each alternative. Consider unit costs as a factor.

#### Task 5: Report Submittals

- Submit quarterly progress reports and meet with CIWMB/County/City Staff for review and comments.
- Submit Draft and Final Reports with all text, graphs, and GIS maps in both hard copy and electronic formats.

### **ACTIVITY IMPLEMENTATION FY08-09**

The following activities were implemented in FY08-09:

- Compilation of existing historical aerial photographs for the valley for specific years;
- Review of historical aerial photographs to identify the active channels on the floodplain;
- Completion of a trash survey in the areas east of the plug near Hollister Street, east to the International Border along the main river channel, and along Smuggler's Gulch;
- Preparation of a database with georeferenced information collected during the trash survey;
- Permitting associated with test pits and borings to be completed in the same areas as indicated above;

### **TMDL APPLICABILITY**

There are no TMDLs currently adopted for the Tijuana River or Estuary; however, US EPA has indicated to watershed stakeholders that it is in the initial phases of data gathering for the development of trash and sediment TMDLs.

### **TIME SCHEDULE FOR IMPLEMENTATION**

The test pits and borings described above could not be completed in FY08-09 due to restrictions related to the breeding season of threatened and endangered bird species. These activities could not be conducted until the breeding season ended on September 15, 2009. Activities to be completed in FY09-10 include the following:

- Completion of permitting to excavate test pits and drill borings in the valley;

**TITLE:** Tijuana River and Estuary Trash and Sediment Characterization Study

**ID NUMBER:** TJ-018

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- Conduct sediment sampling to analyze chemicals of potential concern and evaluate grain-size distribution;
- Conduct trash survey in Goat Canyon and areas west of the plug on the main channel to the beach;
- Additional sediment and trash characterization as needed
- Develop cleanup alternatives for addressing trash, waste tires and anthropogenic sediment

#### **PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego (project/consultant management)
- City of San Diego

#### **OTHER PARTICIPATING ENTITIES**

- San Diego Regional Water Quality Control Board
- California Integrated Waste Management Board (Funding Source)

#### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Trash
- Sediment

#### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The trash and sediment characterization study is consistent with the collective watershed strategy in that it will provide information regarding the location and extent of trash and sediment within the Tijuana River Valley. This will lead to the identification of effective water quality activities to reduce the amount of trash and sediment within the valley.

#### **EXPECTED BENEFITS**

This activity is an important step toward the ultimate goal of improving public and environmental health in the Tijuana River Valley. The direct benefits of this activity will be a better understanding of the types, quantities, and locations of trash and sediment in the River Valley. It will also identify and evaluate various alternatives for removing existing waste, preventing future waste transport, and restoring the watershed to a more natural condition.

#### **EFFECTIVENESS ASSESSMENT**

Characterization of the location and extent of trash and sediment will provide the basis for load reduction activities. Future activities will be evaluated through the amount of trash and sediment removed from the system.



**TITLE: City of San Diego Strategic Plan Implementation**  
**ID NUMBER: TJ-019**

### **ACTIVITY IMPLEMENTATION**

In spring 2006, the City of San Diego (City) initiated efforts to proactively address present and anticipated Total Maximum Daily Load (TMDL), Area of Special Biological Significance (ASBS) protection, and Municipal Storm Water Permit requirements using an integrated approach to maximize resources and achieve efficiencies. The result of these efforts was the *Strategic Plan for Watershed Activity Implementation* (Strategic Plan). Its preparation involved reviewing and assessing available monitoring and source data, land use data, and current and anticipated regulatory drivers. The review and assessment were used to prioritize the water quality problems and their sources for the Watershed Management Areas (WMAs) that the City has jurisdiction in and to geospatially prioritize the City's portion of each of those WMAs, using best professional judgment, for activity implementation.

The Strategic Plan uses an integrated, tiered, and phased approach with regards to activity implementation. Activities that address multiple regulations simultaneously and offer multiple environmental sustainability benefits are favored over those that do not (integration). Activities that target pollutant sources and prevent pollutant generation and release in the first place are emphasized and maximized before the implementation of more expensive structural and treatment solutions (tiering). Furthermore, the City pilots activities on a limited scale to measure their effectiveness and efficiency before it implements them on a broad scale (phasing).

In addition, the City is of the opinion that the integration of storm water and urban runoff pollution management with other environmental efforts and infrastructure improvements is crucial for achieving efficiencies and cost savings in a period of seemingly perpetual municipal budget deficits. This integration is also crucial for obtaining the public's support of storm water and urban runoff pollution management efforts.

Development of the Strategic Plan included the formulation of a list of activities to implement during Phase I. These activities have been integrated into the various Watershed Urban Runoff Management Programs (WURMPs) that the City implements in conjunction with other local jurisdictions. Each fiscal year, the City updates its list of activities to reflect new data, schedule changes, and staffing and budgetary considerations. Many of these activities are reported as watershed water quality and education activities in the various WURMPs. However, the City has a list of project types and sources it plans to implement/target with no specific information. Because these are so conceptual in nature, the City does not report on them as specific activities. Those that are concepts not yet into development but planned for initiation within the next few years are listed in the table below.

**Table 1 – Conceptual Projects**

<b>Activity Description</b>	<b>Activity Type Classification</b>	<b>Type</b>	<b>Class</b>	<b>Primary Target Pollutant</b>	<b>Status</b>
Irrigation Hardware Giveaway and Cash for Plants Program	Smart Irrigation Control Incentive Program	Water Quality	Non-structural	Pesticides, bacteria, nutrients, heavy metals	Planning, Implementation and assessment is anticipated to be completed in FY2013. WMA: TBD.
Mission Bay Drive Trash BMP	Inlet Trash/Debris Separation	Water Quality	Structural	Trash	Pre-planning
County Operations Center Green Roof Project Collaboration	Roof Rain Harvesting	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Erosion & Sediment Control Detention Basin	Erosion/Sediment Control BMP	Water Quality	Structural	Sediment, TSS, Metals, Pesticides & Trash	Pre-planning
"Green Mall" Infiltration Retrofit	Green Mall	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Green Roof Project	Roof Rain Harvesting	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Copper Brake Pad Alternative Legislative Mandate	Product Substitution	Water Quality	Non-structural	Metals	Sponsorship of the Brake Pad Partnership is in progress.
Wild Animal Park Demonstration Wetlands Treatment Project	Large-Scale Storm Flow and Multi-Pollutant Treatment System	Water Quality	Structural	Bacteria, Dissolved Minerals, Gross Pollutants, Metals, Nutrients, Oil & Grease, Organics, Pesticides, & Sediment	Cancelled
Basin Plan Triennial Review	N/A	Monitoring	Non-structural	N/A	As needed
Municipal Park Artificial Turf Pilot Project (1)	Artificial Turf	Water Quality	Non-structural	Targeted Multiple Pollutants	Feasibility study in progress.
Municipal Park Artificial Turf Pilot Project (2)	Artificial Turf	Water Quality	Non-structural	Targeted Multiple Pollutants	Feasibility study in progress.
Municipal Park Artificial Turf Pilot Project (3)	Artificial Turf	Water Quality	Non-structural	Targeted Multiple Pollutants	Feasibility study in progress.
Targeted Mobile Hazardous Household Waste Collection Centers	Hazardous Waste Collection	Water Quality	Non-structural	Metals, Trash, Oil & Grease	Pre-planning
Residential Rain Barrel, Downspout Disconnect, and Xeriscaping Incentive Program (1)	Downspout Disconnect; Rain Barrel Incentives	Water Quality	Non-structural	Targeted Multiple Pollutants	Pre-planning
Residential Rain Barrel, Downspout Disconnect, and Xeriscaping Incentive	Downspout Disconnect; Rain Barrel	Water Quality	Non-structural	Targeted Multiple Pollutants	Pre-planning

Activity Description	Activity Type Classification	Type	Class	Primary Target Pollutant	Status
Program (2)	Incentives				
Rain Garden, Xeriscaping, and Landscape Filtration (1)	Rain Garden, Xeriscaping, and Landscape Filtration	Water Quality	Structural or Non-Structural	Targeted Multiple Pollutants	Pre-planning
Rain Garden, Xeriscaping, and Landscape Filtration (2)	Rain Garden, Xeriscaping, and Landscape Filtration	Water Quality	Structural or Non-Structural	Targeted Multiple Pollutants	Pre-planning
Sediment Basin Endowment Fund (1)	Sediment Basin Endowment	Water Quality	Non-structural	Sediment	Pre-planning
Sediment Basin Endowment Fund (2)	Sediment Basin Endowment	Water Quality	Non-structural	Sediment	Pre-planning
Commercial Pest Control	Product Sub	Education	Non-Structural	Pesticides	Planning
Residential Pesticide Management	Product Sub	Education	Non-Structural	Pesticides	In progress through JURMP education program.
LID Regulatory Barriers and Solutions	Municipal Code Modification	Water Quality	Non-structural	Targeted Multiple Pollutants	Pre-planning
Roof Rain Harvesting/Incentives	Roof Rain Harvesting	Water Quality	Structural or Non-structural	Targeted Multiple Pollutants	Pre-planning
Targeted Storm Drain Cleaning Pilot Project	Storm Drain Maintenance	Water Quality	Non-structural	Targeted Multiple Pollutants	Pre-planning
Targeted Behavioral Training (staff)	Targeted Behavioral Training (staff)	Education	Non-structural	Specific to Activity	Pre-planning
Rose Creek Homeless Reduction Program Sponsorship	Homeless Encampment Removal	Water Quality	Non-structural	Bacteria & Trash	Pre-planning
Enforcement Referrals	Enforcement Referrals	Water Quality	Non-structural	Specific to Activity	Pre-planning
Infiltration Vault/Pit Installation (1)	Infiltration Vault/Pit	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Infiltration Vault/Pit Installation (2)	Infiltration Vault/Pit	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Green Street Filtration	Green Street	Water Quality	Structural	TSS, Metals, Bacteria, Pesticides & PAHs	Pre-planning
Green Lot Filtration	Green Lot	Water Quality	Structural	TSS, Metals, Bacteria, Pesticides & PAHs	Pre-planning
Green Mall Filtration	Green Mall	Water	Structural	TSS, Metals,	Pre-planning

Activity Description	Activity Type Classification	Type	Class	Primary Target Pollutant	Status
		Quality		Bacteria, Pesticides & PAHs	
Limited Low-Flow Storm Drain Inlet Multi-Pollutant Treatment System (1)	Low-Flow Storm Drain Inlet Multi-Pollutant Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Limited Low-Flow Storm Drain Inlet Multi-Pollutant Treatment System (2)	Low-Flow Storm Drain Inlet Multi-Pollutant Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Limited Low-Flow Storm Drain Inlet Multi-Pollutant Treatment System (3)	Low-Flow Storm Drain Inlet Multi-Pollutant Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Small-Scale Storm Flow Storage and Multi-Pollutant Treatment System (1)	Small Scale Treatment Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Small-Scale Storm Flow Storage and Multi-Pollutant Treatment System (2)	Small Scale Treatment Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Small-Scale Storm Flow Storage and Multi-Pollutant Treatment System (3)	Small Scale Treatment Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Large Scale Storm Flow Storage and Multi-Pollutant Treatment System (1)	Large Scale Treatment Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Large Scale Storm Flow Storage and Multi-Pollutant Treatment System (2)	Large Scale Treatment Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Large Scale Storm Flow Storage and Multi-Pollutant Treatment System (3)	Large Scale Treatment Train	Water Quality	Structural	Targeted Multiple Pollutants	Pre-planning
Hydromodification BMP (1)	Hydromod BMP	Water Quality	Structural	Sediment & TSS	Pre-planning
Hydromodification BMP (2)	Hydromod BMP	Water Quality	Structural	Sediment & TSS	Pre-planning
Hydromodification BMP (3)	Hydromod BMP	Water Quality	Structural	Sediment & TSS	Pre-planning
Erosion/Sediment Control BMP (1)	Erosion/Sediment Control BMP	Water Quality	Structural	Sediment & TSS	Pre-planning
Erosion/Sediment Control BMP (2)	Erosion/Sediment Control BMP	Water Quality	Structural	Sediment & TSS	Pre-planning
Home Auto Activities (Metals) Outreach	Outreach	Education	Non-structural	Metals, Oil & Grease & PAHs	In progress through JURMP

Activity Description	Activity Type Classification	Type	Class	Primary Target Pollutant	Status
					education program.
Commercial Landscaping Targeted Enforcement	Targeted Enforcement	Water Quality	Non-structural	Nutrients & Pesticides	Pre-planning
Targeting Marinas and Boat Repair as a Pollutant Source	Targeted Source	Water Quality	Structural or Non-Structural	Metals & Bacteria	Pre-planning
Construction Contractors - Home and Commercial Improvements Inspection Generated Enforcement	Inspection Generated Enforcement	Water Quality	Non-structural	Metals, Sediment, Gross Solids & Oil & Grease	Pre-planning

### **TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL

Note: In addition to current and pending TMDLs, the Strategic Plan reviewed the Clean Water Act 303(d) list of impaired water bodies for the San Diego region and used the information to help prioritize the water quality problems, pollutant sources, and areas of the City to target for activity implementation.

### **TIME SCHEDULE FOR IMPLEMENTATION**

Each activity has its own specific implementation schedule. However, implementation of Phase I of the Strategic Plan (the piloting stage before implementation on a broader scale) is anticipated to occur from FY 2008 through FY 2013.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- All Water Quality Problems are addressed as the goal of the Strategic Plan is to address multiple problems simultaneously as feasible to achieve efficiencies.

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Subsequent to the adoption of the Municipal Storm Water Permit (Order No. R9-2007-0001) in January 2007, the Copermittees developed a Model Watershed Strategy to help guide their planning, implementation, and assessment efforts in the various WMAs. The Model Watershed Strategy assists the Copermittees in developing a Collective Watershed Strategy for each WMA. Application of the Model Watershed Strategy results in prioritizing areas within each WMA for activity implementation; selecting and prioritizing appropriate watershed activities, including monitoring and pollutant source identification studies, for each of the prioritized areas; and identifying data gaps with regards to monitoring and pollutant sources, which need to be filled to enable more refined future management decisions.

Although developed independently of each other, the City's Strategic Plan and the Copermittees' Model Watershed Strategy share the approach of reviewing the best available data (e.g., water quality and pollutant source data) and analyzing them geospatially to make management

decisions regarding: (1) water quality problems to target and activities to implement; and (2) geospatial prioritization of the WMAs for focused activity implementation.

Note that the Strategic Plan is primarily an activity implementation approach. However, the conclusions that it makes regarding priority water quality problems are in harmony with the conclusions made in Section 3, Water Quality Assessment, of this WURMP Annual Report.

**EFFECTIVENESS ASSESSMENT**

<b>Watershed: Tijuana River</b>
<b>CITY OF SAN DIEGO STRATEGIC PLAN IMPLEMENTATION</b>

Each activity will be assessed independently, and programmatic assessment will occur annually in Section 4 of the WURMP annual report.

Assessment of the Strategic Plan is a long-term effort and will involve tracking the City's progress on piloting activities over the next five years to be able to make conclusions on how to optimize the efficiency of its storm water program to meet water quality goals and regulations.

**TITLE: Pet Waste Bag Dispenser Program**  
**ID NUMBER: TJ-020**

**ACTIVITY IMPLEMENTATION**

This activity will target areas frequented by pet owners such as municipal parks and/or street and sidewalk right of ways in the Tijuana River Watershed Management Area (WMA). When pet waste bags are available, pet owners are more apt to pick up pet wastes and dispose of it properly, thereby eliminating pollutants from the environment and potentially from receiving waters. Pet waste bag dispensers will be installed in areas lacking them or in need of additional ones.

This project was in its design and planning stage during FY 2009. Coordination meetings were held between the City of San Diego Education outreach staff and project consultant outlining the strategy associated with educating pet owners about the importance of cleaning up after their pets. Watershed maps were developed and utilized to assist in the selection of potential installation. Criteria used were:

- a) High Density Residential areas
- b) Routes connecting residential areas to a destination (park, trail, waterbody, commercial area)
- c) Established Trail locations
- d) Destination (Park, Open Space area)
- e) Areas draining to a water body impaired for bacteria, phosphorus or nitrogen
- f) Potential for Partnership
- g) Areas of Complaints/Chronic Pet Waste Observations

Three watershed management areas (WMAs) were selected for implementation in FY 2010: Los Peñasquitos, San Dieguito River and Tijuana River.

**TMDL APPLICABILITY**

- San Diego Region Beaches and Creeks Bacteria TMDL

**TIME SCHEDULE FOR IMPLEMENTATION**

Project planning and design started in FY 2009. Program implementation is anticipated to occur in FY 2010.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Tijuana River WMA identify bacteria as high priority water quality problems and recommends implementing load reduction/source abatement

activities to address them. Implementation of this activity will address the high priority water quality problems by reducing exposed pet waste carrying bacteria.

**EFFECTIVENESS ASSESSMENT**

<b>Watershed: Tijuana River</b>	
<b>PET WASTE BAG DISPENSER PROGRAM</b> Assess the Effectiveness of Pet Waste Bag Dispensers	
<b>Management Questions</b>	<ul style="list-style-type: none"> <li>• Does the implementation of dog waste bag dispenser stations help reduce bacteria?</li> <li>• What is the estimated load reduction efficiency of implementing dog waste bag dispenser stations?</li> <li>• Can the number of pet waste bags dispensed be related to a reduction in bacteria in run-off from the park?</li> </ul>
<b>Targeted Measurable Outcome(s)</b>	<ul style="list-style-type: none"> <li>• Number of pet waste bags distributed</li> <li>• Reduction in bacteria in run-off from the park</li> </ul>
<b>Assessment Method(s)</b>	<ul style="list-style-type: none"> <li>• Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)</li> <li>• Quantification (e.g., use number of pet waste disposal bags and their average weight to calculate estimated load reduction)</li> <li>• Tabulation (e.g., amount of money spent on implementation and maintenance, amount of money spent on educational materials, amount of money spent on pet waste disposal bags)</li> </ul>
<b>Recommended Data</b>	<ul style="list-style-type: none"> <li>• Change (%) in load reduction pre and post implementation (Outcome Level 4)</li> <li>• How much money spent on implementation and maintenance</li> <li>• Dataset of load contributions for specific activities (Outcome Level 4)</li> <li>• Change in use of pet waste disposal bags (Outcome Level 3)</li> </ul>

**Objectives**

The goal of this assessment is to determine the effectiveness and efficiency of installing pet waste bag dispensers to reduce bacteria loading and improve water quality.

**Analysis and Results**

The pilot project was not in active implementation during FY 2009. Program launch is anticipated to occur in FY 2010.

**Conclusions**

Effectiveness and efficiency will be determined by comparing load reduction values (determined via monitoring efforts) to the cost of installing and maintaining the pet waste bag dispensers. Conclusions will be made after the assessment is complete.

**TITLE: San Ysidro Centennial Celebration**  
**ID NUMBER: TJ-021**

### **ACTIVITY IMPLEMENTATION**

In order to prevent bacteria pollution in the Tijuana River Watershed Management Area (WMA) in FY 2009, the City of San Diego's *Think Blue* program participated in the San Ysidro Centennial Celebration, a community festival commemorating the 100<sup>th</sup> birthday of San Ysidro. The celebration was held at the San Ysidro Athletic Center in Larsen Field on May 16, 2009.

The celebration targeted key sources of bacteria in the Tijuana River. Participation provided direct outreach to watershed residents dedicated to preserving water quality in San Diego, but primarily focused on water bodies in the Tijuana River WMA. Goals were to increase knowledge and awareness and to encourage everyone to take positive steps in preventing pollution from entering the storm drain.

With more than 7,000 people in attendance, our presence at the event provided a great opportunity to increase direct public education and interact with citizens and visitors about the benefits of pollution prevention.

*Think Blue* provided an outreach booth with *Think Blue* staff and consultants, in order to increase direct public education and interaction. The San Ysidro Festival turned out to be predominantly Spanish speaking citizens and *Think Blue* provided public education materials in both Spanish and English. Public education materials available at the booth included brochures and tip cards, along with Best Management Practice (BMP) giveaways, such as dustpans, pet trash bag containers, and pet trash bag refills. Promotional giveaways included *Think Blue* stickers, eco-friendly pens, pencils, and Frisbees.

*Think Blue* also set up an interactive watershed model demonstration where children were able to interactively participate and learn about a watershed and specific pollutants affecting the water body they lived closest to. The demonstration was given in both English and Spanish.

### **TMDL APPLICABILITY**

- None

### **TIME SCHEDULE FOR IMPLEMENTATION**

*Think Blue* plans to participate in the San Ysidro Centennial Celebration during FY 2010.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria
- Sediment
- Gross Pollutants (Trash)

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Tijuana River WMA identify bacteria, sediment, and gross pollutants

as high priority water quality problems throughout the WMA, and recommend implementing load reduction/source abatement activities to address them. Implementation of this outreach effort will result in both increased knowledge and awareness regarding bacteria and trash as a vector and future load reduction of trash and debris directly and of bacteria indirectly.

**EFFECTIVENESS ASSESSMENT**

<b>Watershed: Tijuana River</b>						
<b>Assess the effectiveness of direct public outreach to increase awareness about storm drain pollution and prevention.</b>						
<b>Management Questions</b>	<ul style="list-style-type: none"> <li>• What change in awareness /attitude regarding bacteria and trash pollutants was achieved after implementation?</li> <li>• How efficient is this education activity based on total cost versus number of people (targeted audience) reached?</li> </ul>					
<b>Targeted Measurable Outcome(s)</b>	<ul style="list-style-type: none"> <li>• Reach pre-set percentage of residents within target watershed</li> <li>• Increased level of knowledge/attitude based on post-activity surveys</li> </ul>					
<b>Assessment Method(s)</b>	<ul style="list-style-type: none"> <li>• Survey (e.g., administer survey to assess knowledge, attitude and willingness to prevent pollution of participants)</li> <li>• Quantification (e.g., number of residents/ visitors reached and number of materials distributed)</li> </ul>					
<b>Data Recorded</b>	<b>Think Blue FY 2009 San Ysidro Centennial Celebration Survey</b>					
		<i>Number of Visitors to Outreach Booth</i>	<i>Gender</i>	<i>Heard of Think Blue?</i>	<i>How have you heard about Think Blue?</i>	<i>Total Materials Distributed</i>
	<b>San Ysidro Centennial Celebration, 2009</b>	156	101 Reported  25% Male 75% Female	66% Yes  34% No	78% TV	2585*
	Estimated total visitors exposed to the <i>Think Blue</i> Booth at the San Ysidro Centennial Celebration in FY 2009 (Outcome Level 1)					7,000
	Number of Surveys administered in FY 2009 (Outcome Level 1)					156
	Percentage of individuals surveyed that believed storm water was an extremely important issue (Outcome Level 2)					95%
	<b>Data Recorded</b>	Percentage of individuals surveyed that knew storm water is not treated (Outcome Level 2)				
Percentage of individuals able to name a concrete action to prevent storm water pollution (Outcome Level 3)					84%	
Percentage of individuals surveyed who reported a willingness to take steps to engage in behavior that would prevent pollution (Outcome Level 3)					100%	

**Objectives**

The goal of this assessment was to determine community knowledge and awareness about storm water issues and whether or not residents would adopt non-polluting behaviors. The goal was to

create positive behavioral change that will reduce bacteria and gross sediment in water bodies in the Tijuana River WMA.

### **Analysis and Results**

The campaign targeted key areas of concern for pollutants in the Tijuana River WMA. The celebration provided direct outreach to residents living within the San Ysidro area. Based on the assessment, many citizens knew about pollution issues in neighboring waterways (95%). However, many were unaware the sewer system and storm drain system are not connected, and that water in the storm drain system is not treated (34%). Efforts were made to educate attendees on awareness of pollutant sources (specifically bacteria), and pollution prevention methods in order to reduce and prevent pollution.

### **Conclusions**

The San Ysidro Centennial Celebration attracted predominantly Spanish speaking residents living in the local watershed. The event provided Storm Water staff an open venue to interact with the community. *Think blue* provided the booth for continued outreach dedicated in preserving water quality in San Diego. The goal was to encourage everyone to take positive steps in preventing pollution from entering the storm drain system. With approximately 7,000 people in attendance, presence at the event provided a great opportunity to spread the message about storm drain pollution prevention.



**TITLE:** Tijuana River Gross Solids and Sediment BMPs Design  
**ID NUMBER:** TJ-022

### **ACTIVITY IMPLEMENTATION**

This activity is the design and construction of trash and sediment storm water Best Management Practices (BMPs) to reduce the volume of sediments and gross solids which are transported to the Tijuana River's main channel and the Tijuana River Estuary during storm events.

Initial efforts for this activity began in February 2009 at which time URS was contracted under a Storm Water As-Needed Engineering Contract. In May 2009, URS was engaged under Task Order 8 to prepare 15% concept designs for these projects which included screening and selection of suitable sites and technologies using exiting hydrology and hydrological studies and gross estimates of loading along with number of basic selection criteria. This exercise which yielded initial estimates of the required scale and sizing of the trash and sediment facilities that would be necessary to handle the anticipated loads. Screening criteria also considered basic constrains such as access, available utilities, operations and maintenance, and community acceptance. A basis of design technical memorandum was prepared summarizing an order-of-magnitude cost estimates and scheduling for the design, permitting and construction of the BMPs.

Follow activities shall will consist of the completion of o an ongoing trash and sediment characterization studies and more specific studies and reports to include hydrology and hydraulic studies, sediment and trash loading of the Tijuana River valley streams will be prepared to be utilized in more advanced design documents as well as provide information for future permitting and environmental documentation.

Next steps consist of further design, permitting and finally construction and operation of these facilities. It is estimated that this effort will continue through 2010 until an estimated project construction completion in mid 2014. Under the current schedule, operation and maintenance of these facilities would commence in winter of the first of these facility would begin in winter of 2014 – 2015.

### **TMDL APPLICABILITY**

- None

### **TIME SCHEDULE FOR IMPLEMENTATION**

At this time schedules as estimated and are based on the availability of funding for these remainder of the project. Schedules developed from the concept design estimated the following implementation schedule:

- 30 % design which will include design specific sizing, siting, hydrology and hydrology studies, stream bed profile and initial design drawings shall be developed by summer of 2012.
- Future design phases of the project including 60% design, 100% design, environmental documentation and permit process are slated to being in summer 2012 until mid 2013.
- Award of construction contracts and construction activities would commence in early 2014 and the initial facilities would be operational by winter of 2014 - 2015.

- Water quality monitoring will be conducted before and after construction to assess the effectiveness in reducing storm water volume and trash and sediment loading including trash characterization. This shall include data from ongoing trash characterization studies.

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego
- City of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Gross pollutants (Trash)
- Sediment

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City’s *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Tijuana River WMA identify gross pollutants (trash) and sediment as high priority water quality problems in the WMA, and recommend implementing load reduction/source abatement activities to address them. Implementation of this activity will address the high priority water quality problems by reducing the volume of trash and sediment in the stream via siltation basins and trash interceptor devices.

**EFFECTIVENESS ASSESSMENT**

<b>Watershed: Tijuana</b>	
<b>TIJUANA RIVER GROSS SOLIDS AND SEDIMENT BMPs</b>	
<b>Assess the Efficiency and Effectiveness Trash &amp; Sediment BMPs</b>	
<b>Management Questions</b>	<ul style="list-style-type: none"> <li>• What is the load reduction efficiency due to implementation of these BMPs?</li> <li>• How effective are the Trash BMPs and Siltation basins at reducing loads of priority pollutants?</li> <li>• What are the operation and maintenance costs associated with these facilities?</li> <li>• Does the implementation of the trash sediment result in a detectible receiving water quality improvement?</li> </ul>
<b>Targeted Measurable Outcome(s)</b>	<ul style="list-style-type: none"> <li>• Change (%) in load reduction pre and post-implementation (Outcome Level 4)</li> <li>• Receiving water quality improvement</li> </ul>
<b>Assessment Method(s)</b>	<ul style="list-style-type: none"> <li>• Inspections (e.g., ensure the infiltration is working as designed)</li> <li>• Quantification (e.g., use drainage area and rainfall information to calculate estimated load reduction)</li> <li>• Monitoring (e.g., collect special study information to collect concentrations and flows to estimate load reduction)</li> <li>• Tabulation (e.g., amount of money spent on implementation and maintenance, revenues and outlays for reclaiming or reusing materials recovered, amount of money spent on educational materials)</li> <li>• Reporting (e.g., estimates of load reduction from 3rd party data)</li> </ul>

**Objectives**

The goal of the analysis is to determine the load reduction efficiency of the Trash and Sediment Best Management Practice (BMP) facilities.

**Analysis and Results**

After construction and initiation data shall be collected from the trash and sediment BMP facilities on an ongoing basis as part of operations. These data shall be analyzed to determine BMP facility efficiency and summarized in periodic reports.

**Conclusions**

Anticipated future monitoring will be conducted to assess pollutant removal efficiencies.



**TITLE:** Tijuana River Watershed Brochure  
**ID NUMBER:** TJ-023

### **ACTIVITY IMPLEMENTATION**

The City of San Diego (City) and *Think Blue* will implement a new brochure program for the six (6) watershed management areas (WMAs) assigned to the City. These brochures will be used to inform San Diego residents on the benefits of taking steps to reclaim an environmentally and economically healthy watershed. The education pieces will help address high priority water quality problems in each WMA. It will also be used to make citizens aware of specific pollutants and ways individual action can be used to protect each water source as a way to promote a watershed stewardship (all individual actions within each watershed adds up in a cumulative way to influence the health of the water resource).

The main goals of the brochures are to capture the audience's attention, enhance the public's understanding of basic watershed principals, address the high priority water quality problems in each WMA, educate best management practices (BMPs) for future use, and encourage citizens to take positive steps in preventing pollution from entering the storm drain system.

The following WMAs will have a watershed specific brochure created:

- Tijuana River
- San Diego River
- San Diego Bay
- Mission Bay
- San Dieguito River
- Los Peñasquitos

### **TMDL APPLICABILITY**

Brochures will target pollutants associated with TMDLs as applicable.

### **TIME SCHEDULE FOR IMPLEMENTATION**

Project planning began in FY 2009 and will continue through FY 2010. Implementation and distribution is expected to occur in late FY 2010.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

### **OTHER PARTICIPATING ENTITIES**

- None

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria
- Nutrients
- Organic Compounds
- Trace Metals
- Pesticides
- Gross Pollutants
- Sediments, TSS, Turbidity

## **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

This activity will address the high priority water quality problems identified in both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for each of the Watershed Management Areas.

## **EFFECTIVENESS ASSESSMENT**

### **Objectives**

The goal of this assessment is to determine the effectiveness of the watershed brochure in increasing knowledge and awareness in each watershed to create positive behavioral changes that will reduce bacteria and gross pollutants. The City is planning a figurative assessment of this exercise. Assessment is still being developed for this activity. Potential assessment methods could include a focused evaluation with two target audiences in combination with various event booths (or workshops). Event attendees would be randomly selected to either receive or not receive the brochure, then asked to complete a response card. At a later point, they will be contacted and asked a series of questions about awareness, knowledge, and behavior to determine if the brochure had an impact.

### **Analysis and Results**

An effectiveness assessment of this activity is not possible at this time because the watershed brochure has not yet been distributed.

### **Conclusions**

The City plans to continue to implement the brochure program in FY 2010. Effectiveness assessments will be conducted after the watershed brochures are implemented in FY 2010. This activity will be used as a watershed education activity as required by the Municipal Permit for education activities.

**TITLE: Water Quality Monitoring at Additional Mass Loading Stations**  
**ID NUMBER: TJ-024**

**ACTIVITY DESCRIPTION**

This activity consists of the installation and monitoring of five mass loading stations (MLS) in the Sweetwater, Otay and Tijuana watersheds. Approximate locations for the Tijuana River Watershed are described below.

Site Designation	Location Description	Lat.	Long.
TIJ02	Pine Valley Creek @ Old Highway 80	33.83776	-116.53725
TIJ04	Campo Creek @ Highway 94	32.60917	-116.47419

The overall purpose of the activity is to acquire more representative data for the southern watersheds which generally only included dry weather grab samples. This will be accomplished through two different sampling methods for dry and wet weather events. For dry weather samples 24 hour continuous sampling will be completed and for wet weather a flow weighted sampling method will be used. Grab samples will be used for all bacteria sampling. A secondary purpose of the study is to compare water quality data from these upper watershed locations with data collected from Mass Loading Stations which are typically located toward the lower portion of the watershed.

The project was designed to collect both field (5) and laboratory (33) parameters during two storm events and two dry weather events. Field parameters included Temperature, Dissolved Oxygen, pH, Conductivity, and Turbidity. Laboratory parameters measured included: Ammonia-N, Antimony, Arsenic (total/dissolved) Cadmium (total/dissolved) Chlorpyrifos, Chromium (total/dissolved), Coliform (total/fecal) and Entrococcus, Copper (total/dissolved), Diazinon, Hardness (total), Iron (total), Lead (total/dissolved), Manganese (total) Malathion, Nickel (total/dissolved) Nitrate-N, Nitrite-N, Orthophosphate-P, Selenium (total/dissolved)TDS, Total Kjeldahl Nitrogen, Total Phosphate-P, TSS, and Zinc (total/dissolved). In addition to these parameters flow measurements will be taken at each station to develop discharge rates and to calculate a discharge equation.

**FY 07-08 ACTIVITY IMPLEMENTATION**

This activity was planned for the FY07-08 reporting period but due to a large wildfire in October 2007 it was delayed until FY08-09.

July 2007                      Agreement between County and Brown and Caldwell signed.  
 October 2007                Study postponed due to wildfires

**FY 08-09 ACTIVITY IMPLEMENTATION**

Two dry weather and one wet weather events were monitored during FY08-09. A second wet weather monitoring event did not occur due to a lack of measurable rain.

July 2008                      First Dry Weather Monitoring event  
 February 2009                First Wet Weather Monitoring event  
 March 2009                    Second Dry Weather Monitoring Event

A report describing the methodology, monitoring reporting titled, "County of San Diego Southern Watersheds Water Monitoring Program Report" by Brown and Caldwell is as attached.

This report also included a comparison of the data collected to the Water Quality Objectives established for a numerous constituents. General findings regarding these are listed below:

#### Metals

All of the metals except Cadmium were detected in at least one sample. Iron was the metal with the highest concentrations. Total Metal concentrations of copper and zinc were lower than at the Tijuana MLS and were lower than the WQO for these constituents.

#### Nutrients

All dry weather results for nutrients were below WQO's, while one wet weather sample exceeded the WQO for nitrite at the lower MLS site.

#### Bacteria

In general bacteria indicators are found at higher levels during wet weather events. Bacteria levels in Tijuana Watershed are 3 to 4 orders of magnitude higher at the MLS location than in the other sites which is indicative of raw sewage.

#### Pesticides

Diazinon was banned for certain uses in the United States since 2003. Most of the monitoring sites of this study seem to indicate this has had a positive effect on this pesticide. Since Mexico still allows the use of this and other pesticides, Diazinon levels in the lower watershed often still exceed the WQO's.

#### Solids

TSS was lower during dry weather than wet weather samples. And all were below WQO's. However TSS samples at the lower Tijuana River Watershed MLS exceeded the WQO's in 16 of 18 samples tested. Higher TSS could be correlative to sewage and industrial wastes inputs.

TDS on the other hand appeared at higher levels during dry weather events. However, for the Tijuana watershed no exceedances were identified.

#### **TMDL APPLICABILITY**

This activity is not specifically implemented in compliance with a TMDL.

#### **TIME SCHEDULE FOR IMPLEMENTATION**

This project was completed during FY 2008-09. No further activity is currently planned.

#### **PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

#### **OTHER PARTICIPATING ENTITIES**

- None

#### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Metals
- Nutrients
- Bacteria
- Pesticides
- Solids

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

This activity supports the following principles that have been established to guide the selection and implementation of watershed activities as part of the Tijuana River Watershed WURMP:

- Characterize water quality conditions throughout the watershed.
- This may be accomplished by conducting special studies where appropriate or by better managing existing data sources.

### **EFFECTIVENESS MEASUREMENTS**

Activity effectiveness was be measured by confirming successful completion of all project elements (Level 1). All project elements were completed during FY 2008-09.



# COUNTY OF SAN DIEGO SOUTHERN WATERSHEDS WATER MONITORING PROGRAM REPORT

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Prepared for  
County of San Diego  
Department of Public Works, Watershed Protection Program  
March 2009

BROWN AND CALDWELL

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# COUNTY OF SAN DIEGO SOUTHERN WATERSHEDS WATER MONITORING PROGRAM REPORT

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## 1. INTRODUCTION

### 1.1 Background

The County of San Diego Department of Public Works, Watershed Protection Program (County) desired to collect dry weather and wet-weather samples at five mass loading stations located in creeks in the southern portion of San Diego County. Brown and Caldwell was selected to perform these services, which consisted of verifying the sampling locations, installing automated sampling equipment, collecting the water samples, submitting the samples to an analytical laboratory for analysis, removal of the sampling equipment, and preparation of this report summarizing the activities and findings..

The agreement for this work was signed in July 2007, with the intent that two dry-weather and two wet-weather events be sampled between July 2007 and October 2008. In late October 2007, several major wildfires devastated large portions of the County, including much of the watershed lands draining to the mass loading stations that were to be monitored under this program. Subsequently, the County decided to postpone monitoring activities in these watersheds. The County elected to resume activities under this agreement in February 2008, and monitoring was conducted between July 2008 and March 2009.

### 1.2 Purpose

The County routinely collects water samples from creeks located throughout San Diego County. However, these samples are generally collected as grab samples that provide data for one point in time only. Also, samples are collected during dry weather only. The monitoring described in this report provides more representative samples because the samples were collected over a longer period of time (24 hours for dry weather samples, and flow-weighted across the duration of storms, with the exception of bacteria which must always be collected as grab samples). The data also provide some information about water quality following a major wildfire.

## 2. MONITORING PROGRAM DESIGN

This section describes the monitoring program design, including the locations of the monitored sites, equipment used, laboratory analyses conducted, and field procedures implemented to conduct the monitoring.

### 2.1 Monitoring Locations

The monitoring locations for this project were specified in the Request for Proposals, and included the following sites:

Table 2-1. Monitoring Site Locations				
Site ID	Watershed	Site Location	Latitude	Longitude
SWT21	Sweetwater	North Fork of Sweetwater River @ Tavern Road	32.80879	-116.78036
SWT07	Sweetwater	Drainage Channel @ Quarry Road and Swap Meet Road	32.70114	-117.00927
OTY03	Olay	Dulzura Creek @ Olay Lakes Road	32.63624	-116.88456
TIJ02	Tijuana	Pine Valley Creek @ Old Highway 80	32.83776	-116.53725
TIJ04	Tijuana	Campo Creek @ Highway 94	32.60917	-116.47419

On August 9, 2007, Brown and Caldwell staff conducted a field reconnaissance visit to all 5 sites. The visit was conducted with Steve Di Donna of the County, who was familiar with the specific features of each site. The purpose of the visit was to verify the locations and determine the physical layout of equipment at each of the sites.

Site Descriptions

- Site SWT21 (North Fork of Sweetwater River at Tavern Road).** This site is located adjacent to the Tavern Road bridge over the river in the unincorporated community of Alpine. The surrounding land use is rural residential, with some equestrian and agricultural uses. At the location of the bridge, the creek is constrained between rock walls and passes through a box culvert beneath the bridge that is divided into two conduits. The monitoring location was sited on the downstream side of the bridge where the creek is no longer constrained by armored banks.



- Site TIJ02 (Pine Valley Creek @ Old Highway 80).** This site is located beneath the Old Highway 80 bridge spanning Pine Valley Creek in the community of Pine Valley. The area immediately surrounding the site is open space and rural residential. The bridge is approximately 50 feet above the creek, and the valley constraining the creek is several hundred feet across at that point. Due to concerns about the ability of a pump to draw water so far, it was decided that the sampling equipment would be housed on the bank of the creek below the bridge, adjacent to one of the support structures (yet above the level of the creek in wet weather).



This monitoring site is accessed via a dirt trail from the side of the bridge.

- **Site TIJ04 (Campo Creek at Highway 94).** The site is located adjacent to the Highway 94 crossing of Campo Creek in the community of Campo. At the location of the bridge, the creek is constrained within a box culvert that is divided into three conduits. The area surrounding the creek is heavily vegetated.



Sampling Site TIJ04  
(Campo)

- **Site OTY03 (Dulzura Creek @ Otay Lakes Road).** This site is located at the creek crossing of Otay Lakes Rd., northeast of Chula Vista. There is a small box culvert conveying the creek across the road that functions during low flows; however, water flows over the road under high flow conditions. The monitoring equipment was installed along the bank of the creek. This area was severely burned during the Cedar Fire in October 2007, eliminating nearly all vegetation on the surrounding hillsides (except for riparian vegetation along the creek bed).



Sampling Site OTY03  
(Otay Lakes)

- **Site SWT07 (Drainage Channel @ Quarry Road and Swap Meet Road).** Site SWT07 is located in the community of Spring Valley, adjacent to newly constructed State Highway 125, and near a vacant parcel used to hold weekend swap meets. The surrounding land uses are residential in nature. The equipment was installed on the bank of the creek (right side of photo).



Sampling Site SWT07  
(Spring Valley)

## 2.2 Analytical Parameters

The field and laboratory analyses for this project were specified in the RFP. The specific field and laboratory parameters to be analyzed are presented in Tables 2-2 and 2-3, along with information regarding field instrument specifications and laboratory methods, sample volume, preservative, holding time, and reporting limit. The analytical laboratories selected for this project included CRG Marine Laboratories (Torrance, CA) for most analyses, and Weston Solutions (Carlsbad, CA) for bacteria analyses (due to short holding times).

Table 2-2 Field Parameters								
Parameter	Principle	Units	Range	TRL	Accuracy	Precision	Recovery	Completeness
Temperature	Thermistor	Degrees Celsius (°C)	0 – 50 oC	N/A	+/- 0.1 °C	No SWAMP requirement; will use + 0.5 or 5%	N/A	No SWAMP requirement; will use 90%
Dissolved Oxygen	Membrane/galvanic cell	mg/L	0 – 19.9	0.2	+/- 0.1 mg/L	No SWAMP requirement; will use + 0.5 or 10%	N/A	No SWAMP requirement; will use 90%
pH	Glass Electrode	s.u.	0 – 14.0	N/A	+/-0.1 s.u.	No SWAMP requirement; will use + 0.5 or 5%	N/A	No SWAMP requirement; will use 90%
Conductivity	Alternating four-electrode	uS/cm	0 - 100	2	+/-1 uS/cm	No SWAMP requirement; will use + 5%	N/A	No SWAMP requirement; will use 90%
Turbidity	Scattering/transmitting light	NTUs	0 - 800	5	+/-1 NTU	No SWAMP requirement; will use + 10% or 0.1, whichever is greater	N/A	No SWAMP requirement; will use 90%

\*Equipment is Horiba U-10 or other multi-parameter meter; accuracy verified with the manufacturer.

Table 2-3. Laboratory Analytical Requirements

Parameter	Method	Volume	Preservative	Holding Time	Reporting Limit
Ammonia-N	EPA 350.2	250 mL	Acidify to pH<2 with H <sub>2</sub> SO <sub>4</sub>	28 days	0.50 mg/L
Antimony (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with HNO <sub>3</sub>	5.0 ug/L
Antimony (Total)	EPA 200.7/200.8	250 mL	HNO <sub>3</sub>	6 months	5.0 ug/L
Arsenic (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with HNO <sub>3</sub>	1.0 ug/L
Arsenic (Total)	EPA 200.7/200.8	250 mL	HNO <sub>3</sub>	6 months	1.0 ug/L
Cadmium (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with HNO <sub>3</sub>	1.0 ug/L
Cadmium (Total)	EPA 200.7/200.8	250 mL	HNO <sub>3</sub>	6 months	1.0 ug/L
Chlorpyrifos	EPA 8081	1000 mL	None	7 days	0.05 ug/L
Chromium (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with HNO <sub>3</sub>	5.0 ug/L
Chromium (Total)	EPA 200.7/200.8	250 mL	HNO <sub>3</sub>	6 months	5.0 ug/L
Coliform (Fecal)	SM 9221 C	100 mL	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	6 hours @ 4°C	20 MPN/100 mL
Coliform (Total)	SM 9221 C	100 mL	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	6 hours @ 4°C	20 MPN/100 mL
Copper (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with HNO <sub>3</sub>	5.0 ug/L
Copper (Total)	EPA 200.7/200.8	250 mL	HNO <sub>3</sub>	6 months	5.0 ug/L
Diazinon	EPA 8081	1000 mL	None	7 days	0.05 ug/L
Enterococcus	SM 9230 B	100 mL	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	6 hours @ 4°C	20 MPN/100 mL
Hardness (Total)	SM 2340 C	250 mL	None	6 months	2.0 mg CaCO <sub>3</sub> /mL
Iron (Total)	EPA 200.7/200.8	250 mL	Acidify to pH<2 with HNO <sub>3</sub>	6 months	20.0 ug/L
Lead (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with HNO <sub>3</sub>	2.0 ug/L
Lead (Total)	EPA 200.7/200.8	250 mL	HNO <sub>3</sub>	6 months	2.0 ug/L
Manganese (Total)	EPA 200.7/200.8	250 mL	HNO <sub>3</sub>	6 months	1.0 ug/L
Malathion	EPA 8081	1000 mL	None	7 days	0.05 ug/L
Nickel (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with	2.0 ug/L

Table 2-3. Laboratory Analytical Requirements					
Parameter	Method	Volume	Preservative	Holding Time	Reporting Limit
				HNO3	
Nickel (Total)	EPA 200.7/200.8	250 mL	HNO3	6 months	2.0 ug/L
Nitrate-N	EPA 300.0	250 mL	None	48 hours	0.2 mg/L
Nitrite-N	EPA 354.1	250 mL	None	48 hours	0.005 mg/L
Orthophosphate-P	EPA 365.2	250 mL	None	48 hours	0.02 mg/L
Selenium (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with HNO3	5.0 ug/L
Selenium (Total)	EPA 200.7/200.8	250 mL	HNO3	6 months	5.0 ug/L
Total Dissolved Solids	EPA 160.1	1000 mL	None	7 days	25.0 mg/L
Total Kjeldahl Nitrogen	EPA 351.3	1000 mL	H2SO4	28 days	0.80 mg/L
Total Phosphate-P	EPA 365.3	250 mL	H2SO4	28 days	0.02 mg/L
Total Suspended Solids	EPA 160.2	1000 mL	None	7 days	2.5 mg/L
Zinc (Dissolved)	EPA 200.7/200.8	250 mL	None	6 months after filtration and preservation with HNO3	5.0 ug/L
Zinc (Total)	EPA 200.7/200.8	250 mL	HNO3	6 months	5.0 ug/L

### 2.3 Field Equipment Installation and Calibration

The monitoring stations were installed at the locations described above during Spring 2008. At each location, a concrete pad measuring approximately 4 feet square was formed and poured in place as a base for the equipment. Knaack utility boxes were then mounted on the pads and bolted from the inside to the concrete pad to provide secure housing for the automated sampling equipment. Flow was monitored at all stations using American Sigma (Hach) autosamplers and flow meters. Field crews measured the flow rate of each stream using a hand held flow meter (Marsh McBirney FloMate). Based on these data, discharge rates were developed for each of the streams at the locations of the monitoring stations. These discharge rates were used to calculate a discharge equation, which was used to program the flow monitoring equipment. Each station was also equipped with a solar panel to recharge the batteries and a rain gauge mounted on a pole to record rainfall at each location. The installations were performed in April, 2008. Most of the installations were straightforward, with the exception of Station TIJ02 (Pine Valley Creek @ Old Highway 80) which required the use of a crane to lower the utility box and equipment down from the bridge to the sampling location.



Autosampler installation at Pine Valley site TIJ04

### 3. MONITORING ACTIVITIES AND RESULTS

#### 3.1 Sampling Schedule

Monitoring was conducted on the following dates and stations:

Date of Sampling	Rainfall Amount*	Type of Sampling	Stations Monitored	Comments
July 30-31, 2008	N/A	Dry-weather, 24-hour time weighted composite	SWT07, SWT21, and TIJ02	Stations OTY03 and TIJ04 were dry.
February 6-7, 2009	1.23 in.	Wet-weather, flow-weighted composite	OTY03, SWT07, SWT21, and TIJ04	Insufficient rainfall at Station TIJ02 to capture the storm event.
March 30-31, 2009	N/A	Dry-weather, 24-hour time weighted composite	OTY03, SWT07, SWT21, TIJ02, and TIJ04	All stations captured.

\* Rainfall measured at Campo Rain Gauge No. MCMNC1 (Cameron Fire Station).

This project was intended to capture a second storm event; however, a second event was not sampled due to limited rain events that produced adequate runoff in the southeastern part of the County, or because the rain events occurred on holidays.

#### 3.2 Sampling Protocols

Field Data sheets were completed at each sample location, for each event, and are included in Appendix A. Digital photographs were also taken at each site, showing the actual sample collection point, as well as conditions upstream and downstream of the sampling site.

CRG Marine Laboratories and Weston Solutions provided chain of custody (COC) forms for the project. Sampling crews completed these forms while on site in the field. Copies of all COC forms are included in Appendix A.

In the field, all samples were placed on wet ice or frozen ice packs until shipment. Identification information for each sample was recorded on the field data sheets and chain-of-custody forms. Samples were handled, prepared, transported, and stored in a manner so as to minimize loss, misidentification, contamination, and/or degradation. Samples were transported on ice and in insulated containers (e.g., insulated cooler). All caps and lids were checked for tightness prior to shipping. Efforts were taken to minimize the leakage of any melted ice from the sample shipment container. Sample packaging included the following steps:

- Grab samples (for bacteria) were placed in a sealed plastic bag (Ziploc) to prevent leakage. Ice (double bagged in plastic trash bags) was placed in the cooler with the samples to maintain the samples at 4° C during transport to Weston Solutions' Carlsbad facility for analysis.
- Grab samples were delivered to Weston Solutions in time to meet 6-hour holding times for bacteria.
- 19-liter glass bottles were placed in individual trash containers sized small enough to fit them for transport to CRG Marine Laboratories.

- The Chain-of-Custody (COC) records were placed in a waterproof plastic bag and placed inside the cooler with the grab samples or taped to the outside of the trash containers (for 19-liter samples).
- 19-liter samples were picked up by the CRG Marine Lab courier in time to meet sample holding times.

The collected samples were delivered to the laboratory for analyses as soon as practicable. Any delay in the receipt of the samples by the laboratory could necessitate a re-sampling and analysis effort.

At the end of the sampling activities, each crew will deliver the samples for chemical analyses with the respective COC forms to Babcock, or coordinate with a reliable courier for sample drop off. Table 4-4 provides contact information and driving directions to Babcock Laboratories. In the event that samples need to be dropped off on a weekend or after standard hours of operation, the Brown and Caldwell Project Manager contacted CRG and Weston to make special arrangements for laboratory staff to be available.

The sample receipt personnel at the laboratory will open the container and perform an initial inspection of the contents to check for evidence of breakage and/or leakage. The container will be inspected for COC documents and any other information or instructions. The sample custodian will verify that all information on the sample bottle labels is correct and in accordance with the COC documents and will sign for receipt. If discrepancies are noted between the COC and the sample labels, the project contact will be notified immediately. Contract laboratories will follow the sample custody procedures outlined in their QA plans. These QA plans are on file with each respective laboratory. All samples will be stored in a refrigerated, secure area. Samples will be removed from storage as needed by the analyst; analysts check out samples by signing a logbook maintained in sample control for tracking samples.

### 3.3 Quality Assurance/Quality Control

Water quality samples were collected in order to ensure the collection of representative water samples. CRG Marine Laboratories and Weston Solutions implemented quality assurance and quality control programs in accordance with guidelines established by the State of California and the U.S. EPA., and are certified under the State Environmental Laboratory Accreditation Program (ELAP). Field duplicates were collected at the rate of 10 percent and analyzed blind by the laboratories.

### 3.4 Results

The following sections provide a summary and interpretation of the data collected during the three water sampling events that were analyzed. Laboratory analytical results are summarized in Table 3-2.

Table 3-2. Analytical Results and Comparison to Water Quality Objectives

Parameter/Units	WQO	Source	Dry Weather Event July 31, 2008			Dry Weather Event March 2009					Wet Weather Event February 6, 2009			
			TIJ02 (Pine Valley)	SWT07 (Spr. Valley)	SWT21 (Alpine)	OTY03 (Otay Lakes)	SWT07 (Spr. Valley)	SWT21 (Alpine)	TIJ02 (Pine Valley)	TIJ04 (Campo)	OTY03 (Otay Lakes)	SWT07 (Spr. Valley)	SWT21 (Alpine)	TIJ04 (Campo)
Ammonia-N, mg/L			ND	0.07	0.05	ND	0.1	ND	0.03	ND	0.03	0.12	0.08	0.12
Antimony (Dissolved), ug/L	calculated	40CFR 131	ND	0.4	0.1	0.1	0.5	0.1	ND	0.1	NA	NA	NA	NA
Antimony (Total), ug/L	6	Basin Plan	ND	0.4	0.1	0.1	0.5	0.1	ND	0.1	NA	NA	NA	NA
Arsenic (Dissolved), ug/L	340	40CFR 131	0.3	4.4	2.2	1.3	4.4	1.9	0.3	1.6	1.3	2.7	1	1.9
Arsenic (Total), ug/L	340/50	40CFR131/ Basin Plan	0.5	4.6	2.3	1.2	4.6	1.7	0.5	1.5	1.4	2.8	1.3	2.6
Cadmium (Dissolved), ug/L	calculated	40CFR 131	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium (Total), ug/L	4.3	40 CFR 131	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorpyrifos, ng/L	20	CA Dept. of Fish & Game	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium (Dissolved), ug/L	calculated	40CFR 131	ND	0.1	3.9	ND	0.1	5.7	ND	ND	0.1	0.4	0.9	ND
Chromium (Total), ug/L	550	40CFR 131	ND	0.2	4	0.1	0.4	5.7	ND	ND	0.3	1.1	1.8	0.5
Coliform (Fecal), MPN/100 mL	400	Basin Plan	40	170	500	<20	220	40	<20	<20	20	3,500	1,100	160,000
Coliform (Total), MPN/100 mL			500	14,000	700	1,100	8,000	3,000	2,200	1,300	3,500	160,000	13,000	160,000
Copper (Dissolved), ug/L	calculated	40CFR 131	ND	1.8	ND	1.7	2.8	0.8	0.4	0.5	1.4	4.3	2.4	1
Copper (Total), ug/L	13	40CFR 131	0.4	2.7	0.8	1.4	3	0.8	ND	0.5	2.4	10.3	4.9	2.5
Diazinon, ng/L	80	CA Dept. of Fish & Game	ND	35.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Enterococcus. MPN/100 mL			80	80	340	<20	800	220	70	300	500	50,000	5,000	17,000
Hardness (Total), mg/L			149.7	795.1	574.3	321.1	757.8	585.6	137	397.6	354.8	93.6	157.8	385.8
Iron (Total), ug/L			68	80	47	97	70	37	64	86	267	704	897	1046
Lead (Dissolved), ug/L	calculated	40CFR 131	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.15	ND	ND
Lead (Total), ug/L	65	40CFR 131	ND	0.19	0.06	0.21	0.21	ND	ND	0.06	1.09	7.71	2.22	3.97
Manganese (Total), ug/L			19.8	102.9	47.6	20.9	134.4	18.1	23.3	62.6	92	82.6	91.5	212.3
Malathion, ng/L	430	CA Dept. of Fish & Game	ND	ND	ND	ND	ND	ND	ND	ND	ND	34.8	18.9	ND
Nickel (Dissolved), ug/L	calculated	40CFR 131	0.4	2.1	0.9	0.4	2.2	1	0.4	0.3	0.5	1.2	0.8	0.6
Nickel (Total), ug/L	100	Basin Plan	0.5	2.2	1.1	0.4	2.2	1	0.4	0.3	0.9	2	1.5	1
Nitrate-N, mg/L	10	Basin Plan	0.8	8.1	16.26	0.03	7.21	14.37	0.47	ND	0.68	1.04	2.96	0.09
Nitrite-N, mg/L	1	Basin Plan	ND	0.07	ND	ND	0.14	ND	ND	ND	ND	0.09	0.09	ND
Orthophosphate-P (Dissolved), mg/L			0.0363	0.0812	0.0644	ND	0.1238	0.0505	0.0075	0.0075	ND	0.1411	0.1208	0.0721
Orthophosphate-P (Total), mg/L			ND	0.07	0.05	0.03	0.16	0.06	0.03	0.1	0.03	0.2	0.19	0.15
Selenium (Dissolved), ug/L	20	40 CFR 131	2.4	6	1.3	0.4	4.8	1.8	2.1	0.2	0.5	0.4	0.3	0.2
Selenium (Total), ug/L	20	40 CFR 131	2.2	5.8	1.2	0.3	4.9	1.5	2.3	ND	0.5	0.4	0.3	0.2
Total Dissolved Solids, mg/L	1500	Basin Plan	388	3226	1116	936	3008	1206	332	1086	994	358	410	1114
Total Kjeldahl Nitrogen, mg/L			0.63	1.8	0.98	0.91	1.1	0.84	0.84	0.98	0.84	1.5	1.7	1.1
Total Suspended Solids, mg/L	100	USEPA Multisector General Permit	1.5	4	8	10	2.3	4	2.3	0.7	51.6	93	86	52

Table 3-2. Analytical Results and Comparison to Water Quality Objectives

Parameter/Units	WQO	Source	Dry Weather Event July 31, 2008			Dry Weather Event March 2009					Wet Weather Event February 6, 2009			
			TIJ02 (Pine Valley)	SWT07 (Spr. Valley)	SWT21 (Alpine)	OTY03 (Otay Lakes)	SWT07 (Spr. Valley)	SWT21 (Alpine)	TIJ02 (Pine Valley)	TIJ04 (Campo)	OTY03 (Otay Lakes)	SWT07 (Spr. Valley)	SWT21 (Alpine)	TIJ04 (Campo)
Zinc (Dissolved), ug/L	calculated	40CFR 131	0.6	3.6	0.5	0.1	7.8	ND	0.2	ND	1.5	10.8	4.8	4
Zinc (Total), ug/L	120	40CFR 131	2.3	6.8	4	0.1	10.6	2.2	3.1	ND	12.5	56.7	23.6	21.6

ND: Non-detect NA: Not analyzed

### 3.5 Data Interpretation and Comparison to Data from Mass Loading Stations and Water Quality Objectives

The San Diego Stormwater Copermittees conduct dry and wet-weather monitoring for compliance with their areawide NPDES stormwater permit (RWQCB Order 2007-001). This sampling is conducted at mass loading stations (MLS), typically located toward the lower end of each major watershed, above the zone of tidal influence. Data from the southern watersheds study were compared to data collected at the Sweetwater and Tijuana River mass emissions stations reported in the 2006-07 Annual Monitoring Report, the most recent season these stations were monitored. These MLS stations were selected because 2 of the southern watersheds sites are located in the upstream portions of the Sweetwater River watershed, and 2 are located in the Tijuana River watershed. The first station is located in the Otay River watershed, but there is no downstream MLS station on the Otay River to compare to. The report provides a comparison of the southern watersheds data with MLS stormwater data collected over 6 years of monitoring (from 2001-02 through 2006-07).

The data from the southern watersheds study were also compared to the Water Quality Objectives (WQOs) established for a number of constituents. The following section provides a summary and discussion of these comparisons.

#### Metals

Water samples from the southern watersheds sites were analyzed for a large suite of total and dissolved metals including antimony, arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, selenium, and zinc. All of the metals except cadmium were detected in at least one sample. The highest metals concentrations were observed for iron. Total iron ranged between 137 ug/L and 795.1 ug/L in dry weather samples and between 93.6 ug/L and 385.8 ug/L in wet weather samples. This is likely due to the presence of iron in solids. Total metals concentrations of copper and zinc which are often used as indicators of heavy metals in urban runoff were similar to those observed at the Sweetwater MLS, but lower than those from the Tijuana River MLS. None of the southern watersheds samples exceeded the WQOs for either constituent. Total copper ranged between ND and 2.7 ug/L in dry weather samples and between 2.4 and 10.3 ug/L in wet weather samples. Total zinc ranged between ND and 10.6 ug/L in dry weather samples and between 12.5 and 56.7 ug/L in wet weather samples. By comparison, stormwater samples collected at the Sweetwater MLS ranges from <5 ug/L to 18 ug/L for total copper and between <20 ug/L to 47 ug/L for total zinc. In Total metals were higher in wet weather, suggesting a likely association with sediments. In contrast, stormwater samples at the Tijuana River MLS exceeded the WQO for copper in 9 of the 18 samples collected at this station since 2001-02, ranging in concentration from 8 ug/L to 197 ug/L. Similarly, zinc exceeded the WQO 6 times, with concentrations ranging from <20 ug/L to 1,530 ug/L. The Tijuana River receives significant inputs of industrial waste and municipal wastewater, in addition to urban runoff, which likely explains the elevated levels in the downstream portions of that watershed.

#### Nutrients

Water samples in this study were analyzed for several nutrient indicators (nitrate-N, nitrite-N, total orthophosphate-N, and dissolved orthophosphate-N). All results were below WQOs except both dry weather samples collected from the SWT21 (Alpine) site, which had concentrations of 16.26 mg/L and 14.37 mg/L, both above the Basin Plan objective of 10 mg/L. A possible source of the nitrate could be septic tank leakage from rural residential parcels in this area (this has not been confirmed). Nitrite was ND in 7 of the 8 dry weather samples and 2 of the 4 wet weather samples. All detections were less than or equal to 0.14 mg/L. Total orthophosphate ranged from ND to 0.16 mg/L in dry weather samples and between 0.03 mg/L and 0.2 mg/L in wet weather samples. In comparison the stormwater samples from the MLS stations, none of the

samples from the Sweetwater or the Tijuana River MLS exceeded the WQO for nitrate. One sample from the Tijuana River MLS exceeded the WQO of 0.1 mg/L for nitrite. The MLS samples were not analyzed for orthophosphate-P.

### Bacteria

Bacterial indicators analyzed in this study included total and fecal coliform and enterococcus. In general, bacterial indicators were present at higher levels in wet weather samples than in dry weather samples. Monitoring indicated exceedance of the Basin Plan WQO for fecal coliform (400 MPN/100 mL) in one dry weather sample and in 3 of the 4 wet weather samples. The highest level of fecal coliform (160,000 MPN/100 mL) was observed in the wet weather sample from site TIJ04 (Campo). Total coliform counts ranged from 500 MPN/100 mL to 14,000 MPN/100 mL in dry weather samples and between 500 MPN/100 mL and 50,000 MPN/100 mL in wet weather samples. Enterococcus counts ranged between <20 and 800 MPN/100 mL in the dry weather samples, with a median level of 80 MPN/100 mL. In wet-weather, counts were higher, from 500 MPN/100 mL at the Otay Lakes (OTY03) site to 50,000 MPN/100 mL at Spring Valley (SWT07). Similar counts of bacterial indicators were observed in stormwater at the Sweetwater River MLS. At the Tijuana River MLS, bacteria levels in stormwater samples were 3-4 orders of magnitude higher than in the southern watersheds samples (as high as >16,000,000 MPN/100 mL). This is consistent with the fact that portions of the Tijuana River receive inputs of sewage.

### Pesticides

Diazinon and chlorpyrifos were generally non-detect (diazinon was observed in one dry weather sample from the Spring Valley SWT07 site at a concentration of 35.1 ng/L). Malathion was ND in the dry weather samples, but was detected twice in wet weather (at concentrations of 34.8 ng/L at Spring Valley site SWT07, and 18.9 ng/L at Alpine site SWT21). All pesticide detections were below their respective WQOs. Compared with the MLS data, the following observations were made. At the Sweetwater MLS site, diazinon and chlorpyrifos were detected at levels in excess of the WQOs in samples collected between 2001-02 and 2003-04. However, both pesticides were ND in samples collected since that time. Diazinon was banned for certain uses in the United States beginning in 2003, and the decreased concentrations in stream waters appear to correlate with this ban. In contrast, levels of diazinon at the Tijuana River MLS continued to exceed the WQO in samples collected through 2006-07. This may be partly because Mexico has not banned the use of diazinon and significant portions of this watershed are in Mexico. Over the six year MLS monitoring period, malathion was occasionally detected in stormwater samples from the Sweetwater River MLS (all below the WQO). Malathion was detected at levels above the WQO in 8 of the 15 samples at the Tijuana River MLS over this period.

### Solids

Total suspended solids (TSS) concentrations were lower in dry weather than wet weather events. All TSS measurements were below the WQO of 100 mg/L. Specifically, TSS ranged between 0.7 and 15 mg/L in dry weather and between 51.6 and 93 mg/L in wet weather samples. Over the six years of stormwater monitoring at the Sweetwater River MLS, TSS ranges between <20 mg/L and 102 mg/L, with one exceedance of the WQO. By comparison, samples from the Tijuana River MLS exceeded the WQO in 16 of 18 samples, with concentrations ranging between 48 and 8,140 mg/L. Higher TSS levels may be correlative with sewage and industrial waste inputs.

Total dissolved solids (TDS) levels were high, especially in dry weather, and particularly at the Spring Valley site (SWT07), where concentrations exceeded the WQO of 1,500 mg/L during both dry weather events (3,226 mg/L and 3,008 mg/L, respectively).. Wet-weather TDS concentrations were lower, ranging from 358 mg/L at Spring Valley site SWT07 to 1,114 mg/L at the Campo site (TIJ04). Over six years of stormwater

monitoring at the Sweetwater River MLS, TDS exceeded the WQO in 13 out of 18 samples. In contrast, TDS in stormwater from the Tijuana River MLS did not exceed the WQO in any of the 18 samples.

## APPENDIX A

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Copies of Field Forms, Analytical Laboratory Reports and QA/QC  
Documentation

## APPENDIX B

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Copies of Weston Solutions' Wet-Weather Data for Sweetwater River and Tijuana River MLS (from 2006-07 Annual Monitoring Report)

**TITLE:** Smuggler's Gulch, Pilot Channel & Northern Channel Sediment and Debris Removal  
**ID NUMBER:** TJ-025

### **ACTIVITY IMPLEMENTATION**

The City of San Diego (City) performs routine flood control maintenance activities on improved and unimproved channels pursuant to the Regional General Permit (RGP) 53 granted to the County of San Diego. In FY 2009, the City expanded the routine maintenance to include excavation and removal of sediment and trash including tires to include the restoration of the Pilot Channel profile under US Army Corp of Engineers Permit: SPL 2009- I 0719-TCD. The expanded channel excavation activity is performed approximately every four to eight years depending on annual rainfall and sediment deposition and assessed flood risk. In FY 2009, re-establishment of the channel profiles to reduce the risk of flooding in these channels was deemed to be more urgent because of the perceived threat of additional sediment deposition from the recently constructed Federal Border Fence Infrastructure project, and because of the flood which occurred in late November 2008. Consequently, emergency permits were sought from various resource agencies. The extent of the project is the portions of the Smuggler's Gulch from Monument Road overpass to the confluence of the pilot channel approximately 1,400 feet; the portion of the pilot from 100 feet east of the Hollister Street Bridge 5,400 feet westward along the Pilot Channel alignment toward the Tijuana River Estuary.

It is expected that approximately as much as 65,000 cubic yards of sediment will be removed from the channel and as much as 1,000 tons of trash and over 5,000 tires. Trash is separated on site and recycled when practicable; the remained or sediment and trash mixes deemed to uneconomical to separate are disposed of at a landfill. Tires are removed and disposed of by a certified tire disposal and recycling contractor. Sediment impacted less by trash deposition shall be stored off site, once operations are completed where it will be screened and reused onsite or used with the Tijuana River Valley for fill material.

The sediment removal project is necessary 1) to return the drainage facility to a condition where adjacent property is not threatened by flooding, 2) storm water flows convey properly to the main channel, and 3) channel profiles and conditions are restored to reduce the potential for sediment and debris to accumulate and thereby increase the potential of flooding.

### **TMDL APPLICABILITY**

N/A.

### **TIME SCHEDULE FOR IMPLEMENTATION**

During the FY2008-09, sediment and debris was removed along the Smuggler's Gulch. Approximately 5,900 cubic yards of material including sediment, tires and trash were removed and disposed at a Class III sanitary landfill. Typically, removal takes place every other year, but based on precipitation, erosion, and observed patterns of deposition of the trash and sediment, excavation and removal of sediment and trash is underway for FY2009-10.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of San Diego

### **OTHER PARTICIPATING ENTITIES**

- California Department of Fish and Game
- California State Parks
- County of San Diego

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Sediment
- Trash
- Gross Pollutants

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Both the City's *Strategic Plan for Watershed Activity Implementation* and the Collective Watershed Strategy for the Tijuana River WMA identify sediment and trash as high priority water quality problems and recommend implementing load reduction/source abatement activities to address them. This activity results in a direct load reduction of these pollutants.

### **EFFECTIVENESS ASSESSMENT**

This activity will be assessed based on the amount and type of sediment and debris removed.