

CARLSBAD WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM

FISCAL YEAR 2011 ANNUAL REPORT

JANUARY 31, 2012

PREPARED AND SUBMITTED BY THE
CARLSBAD WATERSHED COPERMITTEES

CITY OF CARLSBAD
CITY OF ENCINITAS
CITY OF ESCONDIDO
CITY OF OCEANSIDE
CITY OF SAN MARCOS
CITY OF SOLANA BEACH
CITY OF VISTA
COUNTY OF SAN DIEGO

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EXECUTIVE SUMMARY

This Annual Report describes the Carlsbad Watershed Copermittees' activities during the Fiscal Year (FY) 2011 reporting period (July 1, 2010 through June 30, 2011) to implement Order No. R9-2007-0001 (Permit), issued on January 24, 2007 by the San Diego Regional Water Quality Control Board (RWQCB). In response to the Permit, the Carlsbad Watershed Urban Runoff Program (WURMP) Copermittees worked collaboratively to improve water quality within the watershed throughout FY 2011. The Copermittees will continue to work with the Regional Board to implement, improve, and enhance their programs and activities in the coming years.

This annual report was prepared as a collaborative effort by all jurisdictions within the watershed management area (WMA). The lead Copermittee in this watershed is the City of Carlsbad. Other participating jurisdictions include the Cities of Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, Vista, and the County of San Diego.

In preparing the 2008 Carlsbad WURMP, the Copermittees developed a collective watershed strategy using existing data and information available to the Copermittees related to water quality and potential sources of pollutants to identify the most important water quality problems and sources within the WMA. Some baseline source information was also available through existing literature, including the San Diego Stormwater Copermittees' 2011 Long-Term Effectiveness Assessment (LTEA). The Copermittees then evaluated the hydrologic areas (HAs) to make management decisions about potential targeted activities.

During this reporting period, the Copermittees updated their assessment of potential pollutant generating sources in each hydrologic area in the WMA. The purpose of the assessment was to identify the high priority pollutant sources in each hydrologic area based on the high priority water quality problems (HPWQPs) identified and each source category's likelihood of generating those pollutants. For example, an HA with bacteria as a HPWQP would have sources such as Food Establishments and Animal Facilities included as high priority sources (in addition to others) based on these sources potential for generating bacteria as a pollutant.

A summary of the program accomplishments for FY 2011 is found below:

Water Quality Assessment

Water quality priorities are evaluated each year based on the water quality assessment performed during the previous reporting period. The water quality activities performed during this reporting period were based on the water quality priorities identified in the 2008 Carlsbad WURMP. As such, they do not represent a change from the previous year's high-priority water quality problems and constituents of concern.

HPWQPs in the Carlsbad WMA:

- Bacteria
- Sedimentation
- Nutrients

Carlsbad Watershed URMP Workgroup

Building on the efforts in previous reporting periods, the Carlsbad WURMP Copermittees continued to develop and implement a watershed-based program that addresses the HPWQPs and their sources in the Carlsbad WMA. The Carlsbad WURMP Copermittees met

nine (9) times over the course of the reporting period to plan, implement and assess watershed activities. Through workgroup collaboration, Copermittees had increased their ability to identify and address watershed source pollutants, improve public awareness of watershed-related issues, forged partnerships with other cooperating organizations, and expanded Copermittee capability to implement cost-effective watershed improvement activities.

Watershed Activities

The Carlsbad WURMP Copermittees focused their efforts on the HPWQPs in the watershed during the FY 2011 reporting period. The result of this focused approach has been the active implementation of fifteen (15) watershed activities and nine (9) watershed education activities during the reporting period, all of which focus on HPWQPs and the sources most likely contributing to them.

WURMP activities required by the Permit were conducted during the reporting period. Each WURMP Activity is associated with at least one of the HPWQPs in each HA where the activity is implemented. The listing below identifies the activities implemented, which includes planning, monitoring, and assessment:

Watershed Water Quality Activities

- Loma Alta Creek Ultraviolet Radiation Storm Water Treatment Facility
- Agua Hedionda Creek Restoration – SR-02+
- Stormwater Quality Master Plans for Special Drainage Fee Areas
- Nitrate Source Identification and Abatement: Buena Creek
- Pet Waste Bag Dispenser Program in County Parks
- Upper San Marcos Creek Nutrient Management Plan
- Water Quality Treatment Facility @ Palomar Airport
- Land Acquisitions
- Residential Rain Barrel Subsidies and Distribution
- Upper San Marcos Creek Nutrient Management Plan – Parks Component
- Upper San Marcos Creek Nutrient Management Plan – Golf Courses Component
- Upper San Marcos Creek Nutrient Management Plan – Agriculture Component
- Upper San Marcos Creek Nutrient Management Plan – Monitoring Component
- Loma Alta Water Quality Monitoring Program
- San Diego County *Enterococcus* Regrowth Study

Watershed Education Activities

- Water Quality Runoff Management and Agricultural Waiver Workshop for Nurseries and Agricultural Businesses
- LID Features in San Elijo Nature Center
- Focused Equestrian Outreach
- Upper San Marcos Creek Nutrient Management Plan – Residential Component
- Residential Composting Workshop
- Residential Smart Landscape Evaluation Program
- Residential Rain Barrel Subsidies and Distribution
- Cottonwood Creek Watershed Interpretive Signage
- Ocean Friendly Gardens Workshop Series

As required, Copermittees implemented activities in the watershed as part of the JURMP and WURMP programs. In an effort to report on the Copermittees' activities performed to improve water quality in the WMA, the Copermittees are reporting on JURMP and WURMP activities performed on an HA basis. The data and information is not comprehensive and for some data sets, estimates were used to generate some of the numbers for the activities – the methodology for generating these estimates is explained in [Appendix A](#) of the document. The Copermittees believe that this approach is an important step towards integrating jurisdictional and watershed activities and reporting to best assess and plan for activities that address the identified HPWQPs on an HA basis.

Effectiveness Assessment

The Carlsbad Watershed Copermittees continue to improve the program’s effectiveness assessment by utilizing the six-level assessment framework prepared by the Regional Copermittees in October 2003, where appropriate. This year’s assessment continues to not only evaluate the effectiveness of each individual activity implemented during the reporting period, but also the overall program effectiveness. Although not comprehensive, the effectiveness assessment continues to lay the foundation for future in-depth evaluations of activities and program implementation.

Based upon the requirements of the Permit, the Carlsbad WURMP Copermittees are compliant and effective in implementing the Carlsbad WURMP.

WURMP Improvements

In light of emerging TMDLs, the potential for regional permitting, and the Copermittees’ visioning process¹, the Copermittees are committed to focusing on increasing effectiveness and decreasing duplication of programs.

Regardless of the outcome of these and other issues, the Copermittees remain committed to working closely with the Regional Board in the next year to ensure a reasonable, effective, and achievable Municipal Permit is prepared for reissuance, as Permit reissuance is likely to have significant changes to the WURMPs. The Carlsbad WURMP Copermittees will continue to assess their implementation, reporting and program assessment to look for improvement opportunities.

¹ Described in the Copermittees’ Report of Waste Discharge submittal to the Regional Water Quality Control Board on June 24, 2011.

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1 INTRODUCTION

This Annual Report describes the Carlsbad WURMP Copermittees' activities during the reporting period (July 1, 2010 through June 30, 2011) to implement Order No. R9-2007-0001 (Permit), issued on January 24, 2007 by the San Diego Regional Water Quality Control Board (RWQCB). To respond to the Permit, the Carlsbad WURMP Copermittees worked collaboratively to improve water quality within the Watershed Management Area (WMA) throughout Fiscal Year (FY) 2011. The Copermittees will continue to work to implement, improve, and enhance their programs and activities.

This annual report was prepared as a collaborative effort by all jurisdictions within the watershed. The lead Copermittee in this watershed is the City of Carlsbad. Other participating jurisdictions include the Cities of Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, Vista, and the County of San Diego.

The Permit requires that the Copermittees within the Carlsbad Watershed collaborate in the development and implementation of a watershed-scale program that addresses urban runoff² quality. The rationale for this approach is simple: urban runoff does not adhere to jurisdictional boundaries and often travels through many jurisdictions while flowing to receiving waters. Therefore, the actions of multiple municipalities within a watershed can have a cumulative effect upon downstream receiving waters. The mechanism that the Permit uses to require watershed collaboration is the development and implementation of the Watershed Urban Runoff Management Plan (WURMP). The purpose of the WURMP is to collaboratively identify and address the highest priority water quality issues/pollutants in each watershed and to develop and implement activities to reduce pollutant contributions from jurisdictions' urban runoff, which is conveyed through their respective stormwater infrastructure, (i.e., their municipal separate storm sewer systems, or MS4s). In addition, the Permit requires that the Copermittees develop education, public participation, and land use planning activities that complement and enhance the goals and objectives of their water quality activity program.

Fundamental to both establishing specific WURMP goals and measuring achievement is the understanding that long-term solutions to water quality issues will be more effective if they are correctly, collaboratively, and comprehensively identified and characterized. Based upon the proper identification and targeted characterization, true "watershed-approach" solutions may be applied. The overall goal of the Carlsbad Watershed Urban Runoff Management Program is to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP) and to prevent urban runoff discharges from causing or contributing to a violation of water quality standards.

Water quality priorities are evaluated each year and take into consideration the water quality assessment performed during each previous reporting period. The water quality activities performed during this reporting period were based on the water quality priorities identified in the 2008 Carlsbad WURMP. For the Carlsbad WMA, the water quality priorities are: bacteria, sedimentation, and nutrients.

To target these water quality priorities, the program has identified a series of ongoing and planned water quality, education, public participation, and land use activities. Using the

² Urban runoff in the context of this report generally follows the Order R9-2007-0001 definition, and includes stormwater from precipitation events and non stormwater dry weather flows.

collective watershed strategy as the basis for developing and implementing the activities, the Copermittees focused their efforts on the potential sources that are the most likely high-priority pollutant contributors in the Carlsbad Watershed Management Area. This FY 2011 report details the implementation of the Carlsbad WURMP’s collective watershed strategy.

It is important to note that the Encinas Hydrologic Area (904.4) is not discussed in this report. Lack of exceedances in the jurisdictional dry weather monitoring program, the relative small size of this hydrologic area, and the location within the City of Carlsbad boundary do not support evaluation. Please refer to the City of Carlsbad jurisdictional annual report for further information on activities in this HA.

1.1 COPERMITTEE COLLABORATION

1.1.1 CARLSBAD WURMP MEETINGS

In order to effectively plan and implement the Carlsbad WURMP, the Copermittees met nine (9) times during FY 2011 to coordinate and plan their efforts to collaboratively address water quality issues in the WMA. Furthermore, the Copermittees met to develop and prioritize water quality activities that address pollutants of concern in the watershed, to exchange ideas on how to address high priority water quality pollutants in the watershed, to evaluate the effectiveness of actions, and to collaborate on development of required submittals. See **Table 1-1** below for dates of these meetings and pertinent agenda items discussed at these meetings.

Table 1-1 WURMP Meeting Dates and Agenda Items Discussed

Date	Agenda Item Topics
7/20/2010	Annual Calendar, WURMP Annual Report, Update on FY 2011 Activities, Planning for FY 2012, IRWM, Los Peñasquitos Sediment TMDL, Bacteria Project I TMDL, Loma Alta TMDL, Lake San Marcos, Permit Reissuance Process (LTEA and ROWD), Unfunded Mandate Test Claim
8/17/2010	WURMP Annual Report, Bacteria Project I TMDL and Loma Alta TMDL Updates, Lake San Marcos, Permit Reissuance Process (LTEA and ROWD), Unfunded Mandate Test Claim
10/19/2010	Regional Monitoring Annual Report, WURMP Annual Report, Bacteria Project I TMDL and Loma Alta TMDL Updates, Lake San Marcos, Workgroup Updates, Permit Reissuance Process (LTEA and ROWD)
11/16/2010	WURMP Annual Report, Bacteria Project I TMDL, Los Peñasquitos TMDL, and Loma Alta TMDL Updates, Lake San Marcos, Workgroup Updates, Permit Reissuance Process (LTEA and ROWD)
2/15/2011	Annual Report Debrief, WURMP Annual Cycle, Activity Update, WQ Program Analysis, TMDLs, Permit Reissuance Process (Monitoring, LTEA/ROWD, Meetings with RWQCB), Workgroup Updates, Lake San Marcos
3/15/2011	Activity Update, TMDLs (Bacteria Project I, Loma Alta, Los Peñasquitos), Permit Reissuance Process (Monitoring, LTEA, ROWD), Workgroup Updates, Lake San Marcos
4/19/2011	Lake San Marcos, TMDLs (Bacteria Project I, Loma Alta, Los Peñasquitos), Permit Reissuance Process (Monitoring, LTEA, ROWD), HU to HA Reorganization, Workgroup Updates
5/17/2011	TMDLs (Bacteria Project I, Loma Alta, Los Peñasquitos), Construction Brochure, HU to HA Reorganization, Permit Reissuance Process (Monitoring, LTEA, ROWD), Lake San Marcos
6/21/2011	HU to HA Reorganization, CCMA Meeting and CWN Meeting Debrief, TMDLs (Bacteria Project I, Loma Alta, Los Peñasquitos), Construction Brochure, Permit Reissuance Process (Monitoring, LTEA, ROWD), Lake San Marcos

1.1.2 AGUA HEDIONDA WATERSHED MANAGEMENT PLAN

During FY 2008, the watershed Copermittees collaborated in the completion of the Agua Hedionda Watershed Management Plan (AHWMP) – a grant funded effort led by the City of Vista. Since the completion of the plan, the City of Vista formally adopted the AHWMP in the spring of 2009. The AHWMP provides a comprehensive, scientifically-based plan for preserving, restoring, and enhancing the Agua Hedionda Watershed’s natural functions and

features. It assesses past, present, and future watershed conditions and identifies management needs throughout the watershed, considering the complex relationships among different watershed processes. The recommendations of the AHWMP represent a geographically focused, comprehensive watershed planning effort. The plan presents management measures for achieving and sustaining measurable water quality improvements and recommends focus areas where opportunities will complement each other and lead to greater improvement in watershed functions.

With City Council support, the Vista Engineering Department and Water Quality Protection Program began working on the SR-02 project, one of the key restoration projects recommended in the Agua Hedionda Watershed Management Plan. This project encompasses restoration of approximately 3,800 linear feet of Agua Hedionda Creek on City property. During FY 2011 the City completed the Preliminary Design Report for the project, examining several design options for the restoration. Project proponents are seeking grant funding under the Integrated Regional Water Management (IRWM) Program and Proposition 84 to further the project by completing the final design, permitting, and construction.

1.1.3 WATERSHED MAP UPDATES

No updates have been made to the previously submitted Watershed Map. Please refer to the FY 2008 WURMP Annual Report submitted in January 2009 for the most recent Watershed Map.

1.2 ORGANIZATION AND CONTENT OF REPORT

SECTION 1 - Introduction

Section 1 of the Annual Report provides a summary of the Carlsbad WURMP Copermittees' efforts to implement the watershed program, including exchanging ideas and information on how best to address high-priority water quality pollutants in the watershed, as well as prioritizing water quality activities based on existing data and identified pollutant sources.

SECTION 2 - Water Quality Assessment

Section 2 provides an updated evaluation and analysis of the Carlsbad WMA's receiving water conditions based on applicable water quality data from the *2010-2011 Receiving Waters and Urban Runoff Monitoring Program Annual Report* (Regional Annual Monitoring Report) (Weston, 2012). Furthermore, the high priority water quality problems (HPWQPs) are compared to the Copermittees' *2011 Long-Term Effectiveness Assessment* (LTEA) (MOE, LWA, Weston, 2011).

SECTION 3 - Pollutant Source Assessment

Section 3 provides an update on the likely sources of urban runoff. Although the assessment covers the entire WMA, it specifically addresses the distinct hydrologic areas that it encompasses; therefore, where applicable, an assessment is provided for each HA (with exception to the Encinas HA).

SECTION 4 - Implementation of Watershed Activities

Section 4 describes activities implemented by the Carlsbad WURMP Copermittees during the FY 2011 reporting period to enhance the public's understanding of basic watershed principles and sources of water pollution. The activities selected and conducted by the Copermittees during FY 2011 address the overall goal of the WURMP and the Permit by focusing on the HPWQPs in all HAs.

SECTION 5 - Effectiveness Assessment

Section 5 provides an assessment of the implementation and effectiveness of the Carlsbad WURMP for the FY 2011 reporting period using concepts from *A Framework for Assessing the Effectiveness of Jurisdictional Runoff Management Programs*. The assessment includes evaluating compliance with the activity-based permit requirements, changes in knowledge and behavior, and BMP implementation and resulting changes in receiving water quality. Consistent with the requirements of the Permit, this assessment involves not only a comprehensive assessment of the WURMP, but also each water quality activity.

SECTION 6 - Conclusions

Section 6 provides conclusions and suggests improvements for focusing future program efforts based on the information presented in the Annual Report.

2 WATER QUALITY ASSESSMENT

This section provides an updated water quality assessment based upon previously established strategies and processes presented in the 2008 WURMP (March 2008). The water quality assessment provides the results of an evaluation and analysis of the Carlsbad Watershed Management Area's (WMA) receiving waters and MS4 conditions based on applicable water quality data, reports, analyses, and other information. Information and data from the *2010-2011 Receiving Waters and Urban Runoff Monitoring Program Annual Report* (Weston, January 2012) was used to conduct the assessment. Each of the hydrologic areas within the Carlsbad watershed, with exception to the Encinas HA, is evaluated discretely. The assessment concludes with identification of the high priority water quality problems (HPWQPs) for each applicable HA.

The San Diego County Municipal Copermittees *2010-2011 Receiving Waters and Urban Runoff Monitoring Report* (Weston Report) includes significant analyses of the monitoring activities conducted within the Carlsbad WMA during the reporting period. As a part of the Weston Report, assessments of the HAs (with exception to the Encinas HA) during both wet weather and ambient weather monitoring conditions are presented in an integrated manner to convey an overall assessment of each. The integrated assessment identifies which constituents tend to occur in the watershed more frequently than others. For a detailed understanding of the analysis and assessment conducted as part of the regional monitoring effort it is highly recommended that the reader review the Weston Report available at www.projectcleanwater.org. The Carlsbad WMA is the focus in Section 5 of the Weston Report.

The Carlsbad WMA is comprised of 135,602 acres and six hydrologic areas (HAs): Loma Alta, Buena Vista Creek, Agua Hedionda, Encinas, San Marcos, and Escondido Creek. The WMA has historically monitored two mass loading stations (MLS), one on Agua Hedionda Creek and one on Escondido Creek. Four temporary watershed assessment stations (TWAS) have been monitored to date in the WMA, one each in Loma Alta and Buena Vista HAs, and two in the San Marcos HA (one utilized for each the wet and dry seasons). Finally, there are numerous dry weather monitoring (DWM) sites and coastal storm drain monitoring (CSDM) sites throughout the WMA.

Table 2-1 provides a summary of the monitoring activities conducted in the Carlsbad WMA during FY 2011, in compliance with the Permit. **Figure 2-1** depicts the locations of monitoring stations within the Carlsbad WMA that were used to collect samples as part of the regional monitoring effort.

Table 2-1 2010-2011 Monitoring Activities within the Carlsbad WMA

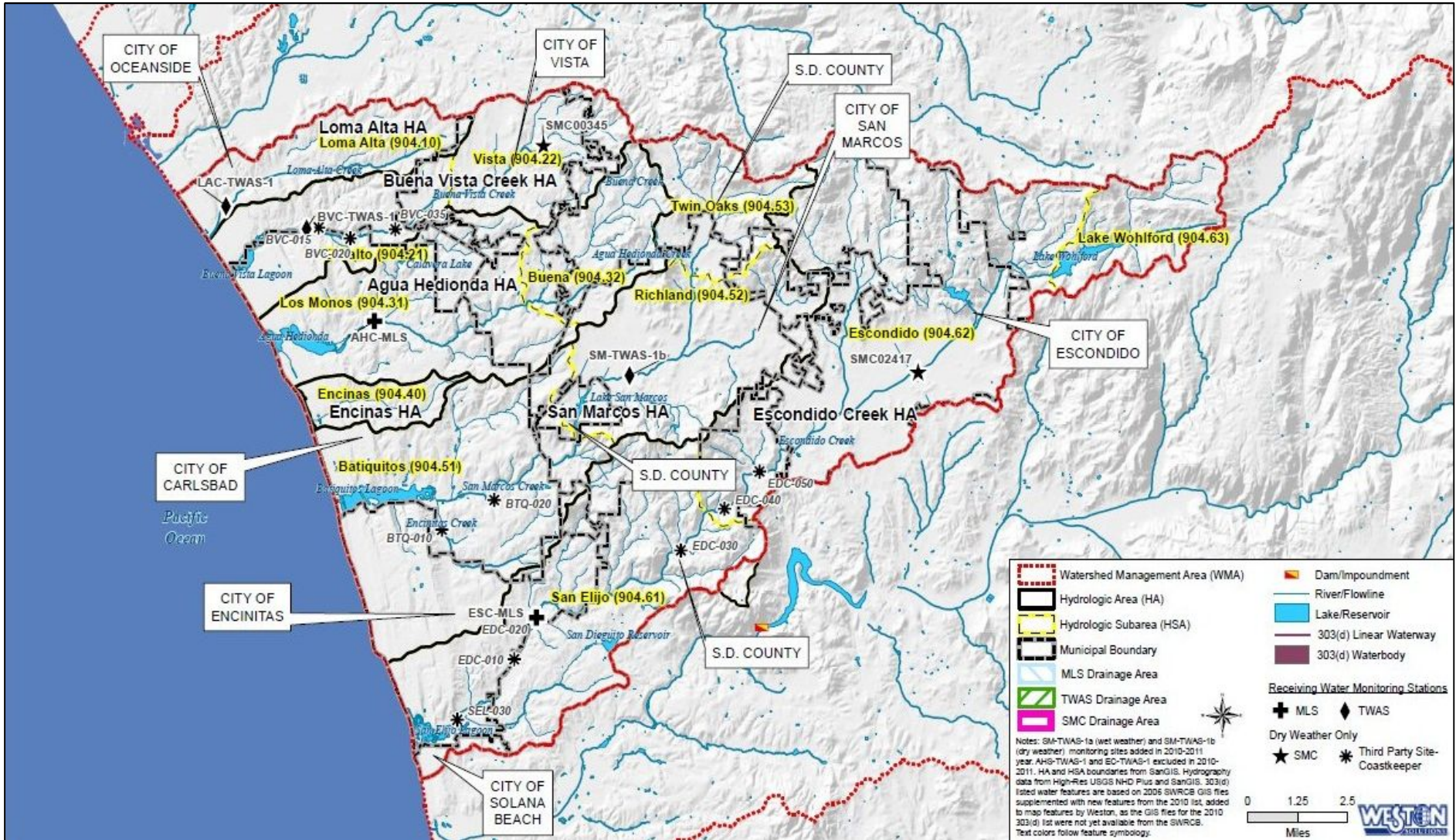
Program Data Set	Constituents Assessed	Loma Alta	Buena Vista Creek	Agua Hedionda	San Marcos	Escondido Creek
Receiving Water Monitoring						
Ambient Monitoring	Water chemistry, toxicity, bacteria, and trash	✓	✓	✓	✓	✓
Rapid Stream Bioassessments*	Benthic macroinvertebrates, periphyton, and physical habitat		✓			✓
Wet Weather Monitoring	Water chemistry, bacteria, toxicity, sediment chemistry, benthic habitat assessments, and trash	✓	✓	✓	✓	✓
Post-Storm Sediment Pyrethroid Monitoring	Grain size, synthetic pyrethroid pesticides, and TOC	✓	✓	✓	✓	✓
Third-Party Data	General chemistry and bacteria		✓		✓	✓
Ambient Bay and Lagoon Monitoring (ABLM)	Sediment chemistry, toxicity, and benthic habitat assessments, water chemistry, and bacteria					✓
Urban Runoff Monitoring						
Jurisdictional Dry Weather Monitoring	Field and analytical chemistry, indicator bacteria, and trash	✓	✓	✓	✓	✓
MS4 Outfall Random Dry Weather Monitoring	Chemistry and bacteria		✓		✓	✓
MS4 Outfall Random Wet Weather Monitoring	Chemistry and bacteria		✓		✓	
MS4 Outfall Targeted Dry Weather Monitoring	Chemistry, metals, pesticides, and bacteria	✓	✓	✓	✓	✓
MS4 Outfall Targeted Wet Weather Monitoring	Chemistry, metals, pesticides, and bacteria			✓		
Regional Source Identification Monitoring	General chemistry, metals, bacteria, and pesticides					
Coastal Storm Drain Monitoring (CSDM) Program	Indicator bacteria	✓	✓	✓	✓	✓

*Captured through the SMC monitoring

Annual receiving water monitoring is conducted by the Copermittes on a rotating schedule between the north and south portions of San Diego County as described in Table 1 of the Permit. Receiving waters ambient and wet weather monitoring occurred within the Carlsbad WMA during the 2010-2011 reporting period. Rapid Stream Bioassessment and instantaneous receiving water monitoring was conducted through the Stormwater Monitoring Coalition (SMC) Regional Bioassessment Program during one ambient weather event at one site in the Buena Vista Creek HA and one site in the Escondido Creek HA.

Ambient Bay and Lagoon Monitoring (ABLM) was performed at two sites within the Escondido Creek HA, although final station assessment was not performed because salinity did not meet the requirements of the standardized assessment tool.

Figure 2-1 Carlsbad Watershed Management Area Monitoring Station Location Map



2.1 303(d) LISTINGS AND TMDLS

Within the watershed, contaminants identified on the 2010 State Water Resources Control Board (SWRCB) Section 303(d) list are provided in **Table 2-2** with relevant TMDL status/activity. On November 12, 2010, USEPA approved California's 2008-2010 Section 303(d) list of impaired waters and disapproved the omission of several water bodies and associated pollutants that meet federal listing requirements. At that time, USEPA identified additional water bodies and pollutants for inclusion on the State's 303(d) list and provided public notice and the opportunity for public comment on the proposed additions which ended December 23, 2010. On October 11, 2011, USEPA issued its final decision regarding the waters EPA added to the State's 303(d) list.

Table 2-2 Carlsbad WMA SWRCB 2010 Section 303(d) Listed Waterbodies and TMDL Status

Waterbody Name	Pollutant/ Stressor on 2010 SWRCB 303(d) List	HA	TMDL Status
Loma Alta Creek	Selenium and toxicity	904.1	Proposed completion date - 2019
Loma Alta Slough	Indicator bacteria and eutrophic	904.1	Monitoring in support of lagoon and watershed modeling for TMDL development conducted in FY 2009. The RWQCB began development of the Loma Alta Slough Bacteria and Nutrient TMDL in June 2010. Proposed completion date – June 2012.
Pacific Ocean Shoreline, Loma Alta Creek Mouth	Indicator bacteria	904.1	Proposed completion date - 2019
Buena Vista Creek	Sediment toxicity and selenium	904.2	Proposed completion date - 2019
Buena Vista Lagoon	Indicator bacteria, nutrients, and sedimentation/ siltation	904.2	Monitoring in support of lagoon and watershed modeling for TMDL development conducted in FY 2009. Proposed completion date - 2019
Agua Hedionda Creek	<i>Enterococci</i> , fecal coliform, phosphorous, TDS, nitrogen, toxicity, manganese, and selenium	904.3	Proposed completion date - 2019
Buena Creek	DDT, nitrate and nitrite	904.3	Proposed completion date - 2019
Pacific Ocean Shoreline, Moonlight Beach	Total coliform	904.3	The Bacteria I TMDL has been adopted by the California Office of Administrative Law and a Load Reduction Plan is due to the RWQCB in October 2012
Lower San Marcos Creek Watershed (Cottonwood Creek)	DDT, selenium, and sediment toxicity	904.5	Proposed completion date - 2019
Upper San Marcos Creek Watershed (San Marcos Creek)	DDE, phosphorus, selenium, and sediment toxicity	904.5	Proposed Completion date – 2019. Currently in Voluntary Participation Agreement with Upper San Marcos Creek Stakeholders. Selenium proposed completion date 2021
Lake San Marcos	Ammonia as N, and nutrients	904.5	Proposed Completion date – 2019. Currently in Voluntary Participation Agreement with Upper San Marcos Creek Stakeholders
Encinitas Creek	Selenium and toxicity	904.5	Proposed completion date - 2019
San Elijo Lagoon	Indicator bacteria, eutrophic, and sedimentation/siltation	904.6	Monitoring in support of lagoon and watershed modeling for TMDL development conducted in FY 2009. Proposed completion date - 2019
Escondido Creek	<i>Enterococci</i> , fecal coliform, DDT, manganese, nitrogen, phosphate, selenium, sulfates, toxicity, and TDS	904.6	Proposed completion date - 2019
Pacific Ocean Shoreline, Cardiff State Beach	Total coliform	904.6	Proposed completion date - 2019

Source: SWRCB, 2010

2.2 MONITORING PROGRAM INTEGRATION

This section includes an integrated presentation of the watershed monitoring during both ambient and wet weather. The integrated assessment incorporates the results from Watershed receiving water and urban runoff monitoring (MS4, MLS, TWAS, and SMC), with the purpose of overlapping constituents between the programs. Integrated watershed assessment results are presented by HA in **Tables 2-3 to 2-7** below.

Table 2-3 Loma Alta 904.1 HA Integrated Assessment Findings

System Assessed	Annual Dry Weather Constituents Assessment ¹	Annual Wet Weather Constituents Assessment ¹
MS4 Outfall, DWM	Urban Runoff <ul style="list-style-type: none"> ▪ Chemistry – Ammonia (Med), Turbidity (Med) ▪ Bacteria – <i>Enterococci</i>, Fecal Coliform (Med) ▪ Nutrients – Total Nitrogen, Total Phosphorous ▪ TDS – Not observed 	No samples collected during 2010-2011 monitoring
MLS and TWAS Monitoring	Intermediate² Watershed Receiving Water Loma Alta Creek TWAS-1 <ul style="list-style-type: none"> ▪ Chemistry – None above benchmarks ▪ Bacteria – <i>Enterococci</i> (Med) ▪ Bioassessment – Very Poor Index of Biotic Integrity (IBI)* ▪ Nutrients – Total Nitrogen (Med) ▪ Toxicity – <i>C. dubia</i> reproduction*, <i>C. dubia</i> acute (Med), <i>C. dubia</i> chronic (Med), <i>S. capricornutum</i> acute (Med) ▪ TDS – Not observed 	Intermediate² Watershed Receiving Water Loma Alta Creek TWAS-1 <ul style="list-style-type: none"> ▪ Chemistry – Bifenthrin (Med) ▪ Bacteria – Fecal Coliform ▪ Bioassessment – Very Poor Index of Biotic Integrity (IBI)* ▪ Nutrients – None above benchmarks ▪ Toxicity – No toxicity observed ▪ TDS – Not observed Synthetic Pyrethroids in Sediment* <ul style="list-style-type: none"> ▪ None above benchmarks

Notes:

* One sample used in the analysis.

1: High and medium priority constituents are determined following the WMA Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011)

2: Intermediate Watershed Receiving Waters are creeks and rivers

COD - Chemical Oxygen Demand
 DWM - Dry Weather Monitoring
 IBI - Index of Biotic Integrity
 Med - Medium Priority Constituent
 MLS - Mass Loading Station

MS4 - Municipal Separate Storm Sewer System
 SMC - Stormwater Monitoring Coalition
 TDS - Total Dissolved Solids
 TSS - Total Suspended Solids
 TWAS - Temporary Watershed Assessment Station

Within the Loma Alta HA, ambient weather water quality issues outlined by the monitoring programs in both urban runoff and intermediate receiving waters include *Enterococci* and total nitrogen. Other ambient weather water quality issues include ammonia, turbidity, fecal coliform, and total phosphorous in urban runoff, and very poor Index of Biotic Integrity (IBI), *Ceriodaphnia dubia* and *Selenastrum capricornutum* toxicity in intermediate receiving waters. Fecal coliform, bifenthrin, and very poor IBI are the only wet weather water quality issues noted by the monitoring programs.

At present there are insufficient data to complete trend analyses on available ambient and wet weather receiving water data in the Loma Alta HA as three (3) years of monitoring are necessary. Additional monitoring efforts will result in a more robust data set that may be analyzed for trends during future reporting periods.

The findings of this assessment support the existing HPWQPs within the Loma Alta HA, with exception to wet weather nutrients. Other identified constituents may be further analyzed and addressed in future years.

Table 2-4 Buena Vista 904.2 HA Integrated Assessment Findings

System Assessed	Annual Dry Weather Constituents Assessment ¹	Annual Wet Weather Constituents Assessment ¹
MS4 Outfall, DWM	Urban Runoff <ul style="list-style-type: none"> ▪ Chemistry – TSS (Med) ▪ Bacteria – <i>Enterococci</i>, Fecal Coliform ▪ Nutrients – Total Nitrogen, Total Phosphorous ▪ TDS – Observed 	No samples collected during 2010-2011 monitoring
MLS, TWAS, and SMC Monitoring	Intermediate² Watershed Receiving Water Buena Vista Creek TWAS-1 <ul style="list-style-type: none"> ▪ Chemistry – None above benchmarks ▪ Bacteria – None above benchmarks ▪ Bioassessment – Very Poor IBI* ▪ Nutrients – Total Nitrogen (Med) ▪ Toxicity – None above benchmarks ▪ TDS – Observed Stormwater Monitoring Coalition Program* <ul style="list-style-type: none"> ▪ Chemistry - Sulfate ▪ Bacteria – Not analyzed ▪ Bioassessment – Very Poor IBI ▪ Nutrients – Nitrate, Total Nitrogen ▪ Toxicity – No toxicity observed ▪ TDS – Observed Third Party Data (Coastkeeper) <ul style="list-style-type: none"> ▪ Bacteria – <i>Enterococci</i>, <i>E. coli</i> 	Intermediate² Watershed Receiving Water Buena Vista Creek TWAS-1 <ul style="list-style-type: none"> ▪ Chemistry – Bifenthrin (Med) ▪ Bacteria – Fecal Coliform ▪ Bioassessment – Very Poor IBI* ▪ Nutrients – None above benchmarks ▪ Toxicity – No toxicity observed ▪ TDS – Observed Synthetic Pyrethroids in Sediment* <ul style="list-style-type: none"> ▪ Bifenthrin

Notes:

* One sample used in the analysis.

1: High and medium priority constituents are determined following the WMA Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011).

2: Intermediate Watershed Receiving Waters are creeks and rivers.

COD - Chemical Oxygen Demand
 DWM - Dry Weather Monitoring
 IBI - Index of Biotic Integrity
 Med - Medium Priority Constituent
 MLS - Mass Loading Station

MS4 - Municipal Separate Storm Sewer System
 SMC - Stormwater Monitoring Coalition
 TDS - Total Dissolved Solids
 TSS - Total Suspended Solids
 TWAS - Temporary Watershed Assessment Station

Within the Buena Vista HA, ambient weather water quality issues outlined by the monitoring programs in both urban runoff and intermediate receiving waters include: TDS, *Enterococci*, and total nitrogen. TDS, an ambient weather water quality issue based on the results of MS4 and receiving water data, was also found to be an issue in the wet weather monitoring. Fecal coliform, bifenthrin, very poor IBI, and sediment pyrethroids were determined to be water quality issues during the wet weather monitoring.

At present there are insufficient data to complete trend analyses on available ambient and wet weather receiving water data in the Buena Vista HA as three (3) years of monitoring are necessary. Additional monitoring efforts will result in a more robust data set that may be analyzed for trends during future reporting periods.

The findings of this assessment support the existing HPWQPs within the Buena Vista HA. Other identified constituents may be further analyzed and addressed in future years.

Table 2-5 Agua Hedionda 904.3 HA Integrated Assessment Findings

System Assessed	Annual Dry Weather Constituents Assessment ¹	Annual Wet Weather Constituents Assessment ¹
MS4 Outfall, DWM	Urban Runoff <ul style="list-style-type: none"> ▪ Chemistry – Sulfate, Total Selenium (Med) ▪ Bacteria – Fecal Coliform, <i>Enterococci</i> ▪ Nutrients – Nitrate*, Total Nitrogen, Total Phosphorous, Dissolved Phosphorous* ▪ TDS – Observed 	Urban Runoff* <ul style="list-style-type: none"> ▪ Chemistry – Turbidity, Dissolved Copper, Dissolved Zinc ▪ Bacteria – Fecal Coliform ▪ Nutrients – None above benchmarks ▪ TDS – Not observed
MLS and TWAS Monitoring	Intermediate² Watershed Receiving Water Agua Hedionda Creek MLS <ul style="list-style-type: none"> ▪ Chemistry – None above benchmarks ▪ Bacteria – <i>Enterococci</i>, Fecal Coliform (Med) ▪ Bioassessment – Very Poor IBI* ▪ Nutrients – Total Nitrogen (Med) ▪ Toxicity – <i>C. dubia</i> reproduction*, <i>S. capricornutum</i> acute (Med) ▪ TDS – Observed 	Intermediate² Watershed Receiving Water Agua Hedionda Creek MLS <ul style="list-style-type: none"> ▪ Chemistry – Bifenthrin (Med) ▪ Bacteria – Fecal Coliform ▪ Bioassessment – Very Poor IBI* ▪ Nutrients – None above benchmarks ▪ Toxicity – No toxicity observed ▪ TDS – Observed Synthetic Pyrethroids in Sediment* <ul style="list-style-type: none"> ▪ Bifenthrin
MLS Trends³		
Increasing		Total Coliform, Fecal Coliform, TSS, COD, Turbidity, Total Copper, Total Nickel
Decreasing		Diazinon

Notes:

* One sample used in the analysis.

1: High and medium priority constituents are determined following the WMA Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011).

2: Intermediate Watershed Receiving Waters are creeks and rivers.

3: Trends are based on historical data, including data from the 2010-2011 monitoring year.

COD - Chemical Oxygen Demand
 DWM - Dry Weather Monitoring
 IBI - Index of Biotic Integrity
 Med - Medium Priority Constituent
 MLS - Mass Loading Station

MS4 - Municipal Separate Storm Sewer System
 SMC - Stormwater Monitoring Coalition
 TDS - Total Dissolved Solids
 TSS - Total Suspended Solids
 TWAS - Temporary Watershed Assessment Station

Within the Agua Hedionda HA, ambient weather water quality issues outlined by the monitoring programs in both urban runoff and intermediate receiving waters include: *Enterococci*, fecal coliform, total nitrogen, and TDS. Fecal coliform was also found to be a wet weather water quality issue in urban runoff and intermediate receiving waters. Other ambient weather water quality issues include sulfate, total selenium, nitrate, total phosphorous, and dissolved phosphorous in urban runoff, and very poor IBI, and *C. dubia* and *S. capricornutum* toxicity in intermediate receiving waters. Turbidity, dissolved copper, dissolved zinc, and fecal coliform are wet weather water quality issues in urban runoff, and bifenthrin, TDS, and very poor IBI were found to be issues in intermediate receiving waters.

Long-term trend analysis in the Agua Hedionda HA is currently limited to wet weather data collected at the MLS. Of the seven constituents with significantly increasing trends during wet weather, only three have historically been consistently above water quality benchmarks: fecal coliform, TSS, and turbidity. However, during the 2010-2011 Monitoring Season, TSS and turbidity were measured at concentrations below the water quality benchmark. Chemical oxygen demand (COD) has been historically below water quality benchmarks, and total coliform, total copper, and total nickel do not have wet weather water quality benchmarks. One constituent, diazinon, is significantly decreasing and has been below

water quality benchmarks for several years. At present there are insufficient data to complete trend analyses on available dry weather receiving water data.

The findings of this assessment support the existing HPWQPs within the Agua Hedionda HA. Other identified constituents may be further analyzed and addressed in future years.

Table 2-6 San Marcos Creek 904.5 HA Integrated Assessment Findings

System Assessed	Annual Dry Weather Constituents Assessment ¹	Annual Wet Weather Constituents Assessment ¹
MS4 Outfall, DWM	Urban Runoff <ul style="list-style-type: none"> ▪ Chemistry – None above benchmarks ▪ Bacteria – Fecal Coliform, <i>Enterococci</i> ▪ Nutrients – Total Nitrogen, Total Phosphorous, Dissolved Phosphorous, Nitrate (Med) ▪ TDS – Observed 	Urban Runoff <ul style="list-style-type: none"> ▪ Chemistry – TSS (Med) ▪ Bacteria – Fecal Coliform ▪ Nutrients – None above benchmarks ▪ TDS – Not observed
MLS and TWAS Monitoring	Intermediate² Watershed Receiving Water San Marcos Creek TWAS-1b (Dry) <ul style="list-style-type: none"> ▪ Chemistry – TSS (Med), Turbidity (Med) ▪ Bacteria – <i>Enterococci</i>, Fecal Coliform (Med) ▪ Bioassessment – Poor IBI* ▪ Nutrients – Total Nitrogen, Total Phosphorous (Med), Dissolved Phosphorous* (Med) ▪ Toxicity – <i>C. dubia</i> reproduction (Med), <i>S. capricornutum</i> acute (Med) ▪ TDS – Observed 	Intermediate² Watershed Receiving Water San Marcos Creek TWAS-1a (Wet) <ul style="list-style-type: none"> ▪ Chemistry – Bifenthrin (Med) ▪ Bacteria – Fecal Coliform ▪ Bioassessment – Poor IBI* ▪ Nutrients – None above benchmarks ▪ Toxicity – No toxicity observed ▪ TDS – Observed Synthetic Pyrethroids in Sediment* <ul style="list-style-type: none"> ▪ Bifenthrin

Notes:

* One sample used in the analysis.

1: High and medium priority constituents are determined following the WMA Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011).

2: Intermediate Watershed Receiving Waters are creeks and rivers.

COD - Chemical Oxygen Demand
 DWM - Dry Weather Monitoring
 IBI - Index of Biotic Integrity
 Med - Medium Priority Constituent
 MLS - Mass Loading Station

MS4 - Municipal Separate Storm Sewer System
 SMC - Stormwater Monitoring Coalition
 TDS - Total Dissolved Solids
 TSS - Total Suspended Solids
 TWAS - Temporary Watershed Assessment Station

Within the San Marcos Creek HA, ambient weather water quality issues outlined by the monitoring programs in both urban runoff and intermediate receiving waters include: *Enterococci*, fecal coliform, total nitrogen, total phosphorous, dissolved phosphorous, and TDS. Other ambient weather water quality issues include nitrate in urban runoff and TSS, turbidity, poor IBI, and *C. dubia* and *S. capricornutum* toxicity in intermediate receiving waters. Wet weather water quality issues outlined by the monitoring programs in both urban runoff and intermediate receiving waters include fecal coliform. Other wet weather priority constituents include TSS in urban runoff and bifenthrin, poor IBI, TDS, and sediment pyrethroids in intermediate receiving waters.

At present there are insufficient data to complete trend analyses on available ambient and wet weather receiving water data in the San Marcos HA as three (3) years of monitoring are necessary. Additional monitoring efforts will result in a more robust data set that may be analyzed for trends during future reporting periods.

The findings of this assessment support the existing HPWQPs within the San Marcos Creek HA. Other identified constituents may be further analyzed and addressed in future years.

Table 2-7 Escondido Creek 904.6 HA Integrated Assessment Findings

System Assessed	Annual Dry Weather Constituents Assessment ¹	Annual Wet Weather Constituents Assessment ¹
MS4 Outfall, DWM	Urban Runoff <ul style="list-style-type: none"> ▪ Chemistry – Sulfate, Dissolved Oxygen ▪ Bacteria – Enterococci, Fecal Coliform (Med) ▪ Nutrients – Total Nitrogen, Total Phosphorous ▪ TDS – Observed 	No samples collected during 2010-2011 monitoring
MLS, TWAS, and SMC Monitoring	Intermediate² Watershed Receiving Water Escondido Creek MLS <ul style="list-style-type: none"> ▪ Chemistry – None above benchmarks ▪ Bacteria – <i>Enterococci</i> (Med) ▪ Bioassessment – Very Poor IBI* ▪ Nutrients – Total Nitrogen (Med), Total Phosphorous (Med), Dissolved Phosphorous (Med) ▪ Toxicity – <i>S. capricornutum</i> acute (Med) Stormwater Monitoring Coalition Program* <ul style="list-style-type: none"> ▪ Chemistry – Sulfate, Bifenthrin ▪ Bacteria – Not analyzed ▪ Bioassessment – Very Poor IBI ▪ Nutrients – Nitrate as N, Total Nitrogen ▪ Toxicity – No toxicity observed ▪ TDS – Observed Third Party Data (Coastkeeper) <ul style="list-style-type: none"> ▪ Bacteria – <i>Enterococci</i>, <i>E. coli</i> 	Intermediate² Watershed Receiving Water Escondido Creek MLS <ul style="list-style-type: none"> ▪ Chemistry – None above benchmarks ▪ Bacteria – Fecal Coliform ▪ Bioassessment – Very Poor IBI* ▪ Nutrients – None above benchmarks ▪ Toxicity – No toxicity observed ▪ TDS – Observed Synthetic Pyrethroids in Sediment* <ul style="list-style-type: none"> ▪ None above benchmarks
MLS Trends³		
Increasing		Total Coliform
Decreasing		Total Phosphorous, Diazinon

Notes:

* One sample used in the analysis.

1: High and medium priority constituents are determined following the WMA Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011).

2: Intermediate Watershed Receiving Waters are creeks and rivers.

3: Trends are based on historical data, including data from the 2010-2011 monitoring year.

ALBM - Ambient Lagoon and Bay Monitoring
 DWM - Dry Weather Monitoring
 IBI - Index of Biotic Integrity
 Med - Medium Priority Constituent
 MLS - Mass Loading Station

MS4 - Municipal Separate Storm Sewer System
 SMC - Stormwater Monitoring Coalition
 TDS - Total Dissolved Solids
 TSS - Total Suspended Solids
 TWAS - Temporary Watershed Assessment Station

Within the Escondido Creek HA, ambient weather water quality issues outlined by the monitoring programs in both urban runoff and intermediate receiving waters include *Enterococci*, total nitrogen, total phosphorus, sulfate, and TDS. Other ambient weather priority constituents observed in intermediate receiving waters include: *E. coli*, dissolved phosphorous, bifenthrin, nitrate, very poor IBI, and *S. capricornutum* toxicity. Dissolved oxygen and fecal coliform were ambient weather water quality issues in urban runoff. Wet weather priority constituents outlined by the monitoring programs include fecal coliform, TDS, and very poor IBI.

Long-term trend analysis in the Escondido Creek HA is currently limited to wet weather data collected at the MLS. Trend analysis for the Escondido Creek MLS wet weather data indicates three statistically significant trends: total coliform is increasing, while total phosphorous and diazinon are decreasing. Of these three constituents, total phosphorous is the only constituent rated as a high priority during the 2010-2011 monitoring.

Total coliform is the only significantly increasing constituent at the MLS. There is no wet weather benchmark for this constituent, which is increasing at a rate of approximately 2,941 MPN/100mL per year. Total phosphorus and diazinon are both significantly decreasing, and are both below wet weather water quality benchmarks. Diazinon has been below the wet weather benchmark since 2004. At present there are insufficient data to complete trend analyses on available dry weather receiving water data.

The findings of this assessment support the existing HPWQPs within the Escondido Creek HA with exception to wet weather sediment. Sediment-related constituents (TSS and turbidity) were considered a low-priority during the 2010-2011 regional monitoring, although wet weather MS4 outfall monitoring was not conducted in the HA during the reporting period. Other identified constituents may be further analyzed and addressed in future years.

2.3 HIGH PRIORITY WATER QUALITY PROBLEMS AND RECOMMENDATIONS

In developing the Collective Watershed Strategy, the Carlsbad WURMP Copermittees decided that unless there were significant long-term trends indicating otherwise or overwhelming evidence, the high priority water quality problems identified for each hydrologic area would remain throughout the permit cycle.

New data collected and analytical results summarized in this water quality assessment and in the Regional Monitoring Report (Weston, January 2012) will be taken into consideration as watershed activities are established, but do not affect the HPWQPs identified in the Carlsbad WMA. However, in light of the adopted Bacteria TMDL Project I and the Loma Alta Bacteria and Nutrient TMDL (in development), bacteria and nutrients have been added as HPWQPs where applicable. **Table 2-8** below presents the FY 2011 HPWQPs in the WMA.

Table 2-8. Summary of High Priority Water Quality Problems

HA	Bacteria/Pathogens		Sediments		Nutrients	
	Wet	Ambient	Wet	Ambient	Wet	Ambient
Loma Alta	✓				✓	✓
Buena Vista Creek	✓	✓				
Agua Hedionda	✓	✓	✓			✓
San Marcos	✓	✓				✓
Escondido Creek	✓	✓	✓			✓

The HPWQPs in the Loma Alta, Buena Vista Creek, Agua Hedionda, and Escondido Creek HAs have been confirmed by the LTEA, with exception to ambient weather bacteria in Buena Vista Creek (medium priority constituent in the LTEA) and wet weather nutrients in the Loma Alta HA (low priority constituent in the LTEA). Data in the San Marcos Creek HA were limited when determining priority constituents in the LTEA and thus were not presented in the report; therefore, comparisons between the WURMP HPWQPs and LTEA cannot be made for this hydrologic area.

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3 POLLUTANT SOURCE ASSESSMENT

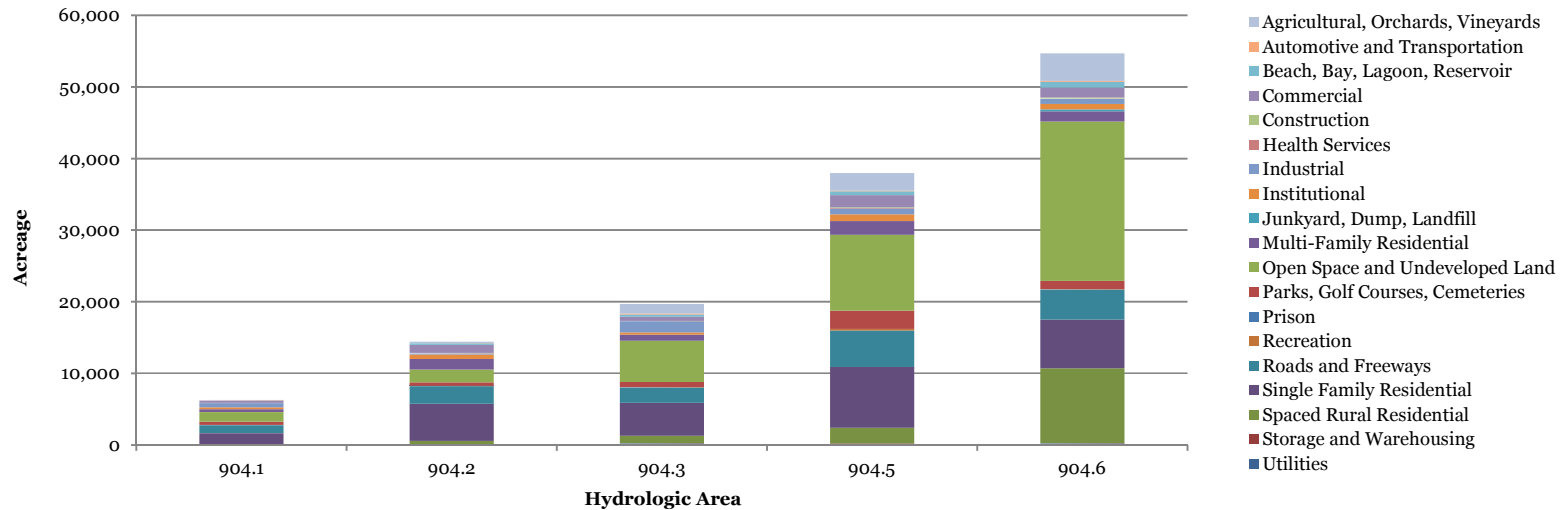
This section identifies, to the extent possible, the potential sources, pollutant discharges, and/or other factors causing the Carlsbad WMA's HPWQPs. The pollutant source assessment is based on currently available data associated with the urban runoff management programs. The pollutant source assessment is presented by hydrologic area.

Table 3-1 summarizes the land use in each of the hydrologic areas. The pollutants found in wet weather urban runoff are generally associated with land uses in the tributary areas. Rainfall runoff mobilizes and transports pollutants from areas that are collectively associated with particular land uses. This is opposed to the pollutants found in dry weather urban runoff that are generally associated with identifiable-source dischargers such as residences, commercial facilities, etc. Pollutants in the dry weather urban runoff enter the runoff from pollutant generating activities and from the traveled path of the urban runoff as it enters and travels through the MS4.

Tables 3-2 through **3-6** represent the inventoried sources that the Copermittees currently track. The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in each table (yellow highlight). This HPWQP is then associated with the sources that are likely to generate those pollutants. The process used to develop the tables was taken directly from the Copermittees' *2011 Long-Term Effectiveness Assessment* (LTEA) (MOE, LWA, Weston, 2011). The data used for the process includes the following: (1) results in the *2010-2011 Receiving Waters and Urban Runoff Monitoring Report* (Weston, January 2012); (2) current inventory information from all watershed Copermittees; and (3) the Source Loading Potential (SLP) ratings from the LTEA (MOE, LWA, Weston, 2011).

Table 3-1 Land Use Acreage by Hydrologic Area

Land Use	Hydrologic Area (acres)					
	904.1	904.2	904.3	904.4	904.5	904.6
Agricultural, Orchards, Vineyards	51.5	183.2	1,358.2	55.0	2,463.2	3,835.0
Automotive and Transportation	9.3	40.3	134.8	202.7	96.8	131.6
Beach, Bay, Lagoon, Reservoir	13.4	222.1	319.3	1.3	520.0	830.8
Commercial	298.1	1,139.8	590.4	274.9	1,715.5	1,355.8
Construction	70.7	23.7	35.7	6.1	91.5	157.8
Health Services	5.7	67.4	11.8	1.3	85.4	58.9
Industrial	557.2	97.9	1,533.7	413.0	814.2	683.1
Institutional	273.2	629.4	320.6	28.2	929.9	798.1
Junkyard, Dump, Landfill	0.0	0.0	0.0	0.0	3.1	238.3
Multi-Family Residential	405.2	1,474.5	836.1	109.8	1,896.5	1,425.9
Open Space and Undeveloped Land	1,339.4	1,805.7	5,786.7	441.9	10,606.0	22,264.5
Parks, Golf Courses, Cemeteries	465.0	477.0	702.8	247.0	2,560.5	1,152.6
Prison	0.0	24.2	0.0	0.0	0.0	0.0
Recreation	11.3	54.3	64.6	138.7	207.3	77.0
Roads and Freeways	1,152.7	2,416.1	2,133.1	356.8	5,094.8	4,182.3
Single Family Residential	1,514.5	5,213.9	4,602.5	155.6	8,484.1	6,777.5
Spaced Rural Residential	44.3	510.5	1,038.0	0.0	2,192.0	10,461.9
Storage and Warehousing	37.3	35.7	29.0	21.7	86.5	49.9
Utilities	26.7	14.0	221.7	35.6	139.8	219.7



Note: HA 904.4 is not shown graphically due to the small overall area. For a land use representation of HA 904.4, please see [Table 3-1](#) above.

Source: SANDAG, 2009

Table 3-2 Pollutant Generating Sources – 904.1 Loma Alta Hydrologic Area¹

Inventory Sites/Facilities ²	Quantities			Pollutant Source Loading Potential ³							
				Metals	Oil & Grease	Sediment	Pesticides	Nutrients	Bacteria/Pathogens	Dissolved Minerals	Organics
Animal	7			N	UL	L	UK	L	L	N	L
Automotive	124			L	L	UL	UL	UK	UL	L	L
Cemetery	1			UK	UK	UK	UK	L	UK	UL	UK
Contractor	100			UL	UL	L	UL	UL	UL	UL	UL
Food Establishment	126			N	L	UL	UK	UK	L	UL	L
Equipment	9			L	L	UL	UL	UK	UL	UL	L
Fueling	6			UK	L	UK	N	N	N	N	L
General Industrial	15			L	L	UK	UK	UK	UK	UK	L
General Retail	207			UL	UL	L	UL	UL	UL	UL	UL
Health Services	15			N	UL	L	UK	L	UL	UK	L
Institutional	11			L	UK	UK	UK	UK	UL	UK	UK
Manufacturing	54			L	L	L	UL	UL	UL	UL	L
Metal	21			L	L	UK	UK	UK	UL	UL	L
Nursery	4			L	UL	L	L	L	L	UL	UL
Stone & Aggregates	5			L	L	L	UL	UL	UL	UL	L
Storage & Warehousing	10			L	L	L	UL	UL	UL	UL	L
Municipal	High		Non-High	N	N	L	N	N	UK	UL	N
	32		2								
Construction	High	Medium	Low	UL	UL	L	UL	UL	UL	L	UL
	7	10	6								
Residential	2,025 acres			L	L	L	L	L	L	L	L

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

1: Prepared based on the WURMP Copermittees FY 2011 JURMP Annual Reports. The methodology for developing the tables is included as **Appendix A** to this report

2: Other sources are not reported in this table including: Land Development and Non-inventoried Businesses

3: Pollutant Source Loading Potential taken from LTEA 2011; N = None, UK = Unknown, UL = Unlikely, L = Likely

Table 3-3 Pollutant Generating Sources – 904.2 Buena Vista Creek Hydrologic Area¹

Inventory Sites/Facilities ²	Quantities			Pollutant Source Loading Potential ³							
				Metals	Oil & Grease	Sediment	Pesticides	Nutrients	Bacteria/Pathogens	Dissolved Minerals	Organics
Agriculture	1			L	UL	L	L	L	L	UK	UL
Animal	6			N	UL	L	UK	L	L	N	L
Automotive	166			L	L	UL	UL	UK	UL	L	L
Contractor	55			UL	UL	L	UL	UL	UL	UL	UL
Food Establishment	404			N	L	UL	UK	UK	L	UL	L
Equipment	3			L	L	UL	UL	UK	UL	UL	L
Fueling	33			UK	L	UK	N	N	N	N	L
General Industrial	10			L	L	UK	UK	UK	UK	UK	L
General Retail	70			UL	UL	L	UL	UL	UL	UL	UL
Health Services	11			N	UL	L	UK	L	UL	UK	L
Institutional	5			L	UK	UK	UK	UK	UL	UK	UK
Manufacturing	10			L	L	L	UL	UL	UL	UL	L
Metal	6			L	L	UK	UK	UK	UL	UL	L
Nursery	28			L	UL	L	L	L	L	UL	UL
Stone & Aggregates	7			L	L	L	UL	UL	UL	UL	L
Storage & Warehousing	16			L	L	L	UL	UL	UL	UL	L
Municipal	High		Non-High	N	N	L	N	N	UK	UL	N
	49		29								
Construction	High	Medium	Low	UL	UL	L	UL	UL	UL	L	UL
	11	12	27								
Residential	7,345 acres			L	L	L	L	L	L	L	L

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

- 1: Prepared based on the WURMP Copermittees FY 2011 JURMP Annual Reports. The methodology for developing the tables is included as [Appendix A](#) to this report
- 2: Other sources are not reported in this table including: Land Development and Non-inventoried Businesses
- 3: Pollutant Source Loading Potential taken from LTEA 2011; N = None, UK = Unknown, UL = Unlikely, L = Likely

Table 3-4 Pollutant Generating Sources – 904.3 Agua Hedionda Hydrologic Area¹

Inventory Sites/Facilities ²	Quantities			Pollutant Source Loading Potential ³							
				Metals	Oil & Grease	Sediment	Pesticides	Nutrients	Bacteria/Pathogens	Dissolved Minerals	Organics
Agriculture	6			L	UL	L	L	L	L	UK	UL
Animal	5			N	UL	L	UK	L	L	N	L
Automotive	85			L	L	UL	UL	UK	UL	L	L
Contractor	59			UL	UL	L	UL	UL	UL	UL	UL
Food Establishment	183			N	L	UL	UK	UK	L	UL	L
Equipment	51			L	L	UL	UL	UK	UL	UL	L
Fueling	19			UK	L	UK	N	N	N	N	L
General Industrial	38			L	L	UK	UK	UK	UK	UK	L
General Retail	53			UL	UL	L	UL	UL	UL	UL	UL
Golf	3			UK	UK	UK	UK	L	UK	UL	UK
Health Services	8			N	UL	L	UK	L	UL	UK	L
Institutional	11			L	UK	UK	UK	UK	UL	UK	UK
Manufacturing	91			L	L	L	UL	UL	UL	UL	L
Metal	46			L	L	UK	UK	UK	UL	UL	L
Nursery	66			L	UL	L	L	L	L	UL	UL
Stone & Aggregates	15			L	L	L	UL	UL	UL	UL	L
Storage & Warehousing	71			L	L	L	UL	UL	UL	UL	L
Municipal	High		Non-High	N	N	L	N	N	UK	UL	N
	52		20								
Construction	High		Medium	UL	UL	L	UL	UL	UL	L	UL
	22		20								
Residential	6,613 acres			L	L	L	L	L	L	L	L

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

- 1: Prepared based on the WURMP Copermittees FY 2011 JURMP Annual Reports. The methodology for developing the tables is included as [Appendix A](#) to this report
- 2: Other sources are not reported in this table including: Land Development and Non-inventoried Businesses
- 3: Pollutant Source Loading Potential taken from LTEA 2011; N = None, UK = Unknown, UL = Unlikely, L = Likely

Table 3-5 Pollutant Generating Sources – 904.5 San Marcos Hydrologic Area¹

Inventory Sites/Facilities ²	Quantities			Pollutant Source Loading Potential ³								
				Metals	Oil & Grease	Sediment	Pesticides	Nutrients	Bacteria/Pathogens	Dissolved Minerals	Organics	
Animal	48			N	UL	L	UK	L	L	N	L	
Automotive	194			L	L	UL	UL	UK	UL	L	L	
Cemetery	1			UK	UK	UK	UK	L	UK	UL	UK	
Contractor	197			UL	UL	L	UL	UL	UL	UL	UL	
Food Establishment	526			N	L	UL	UK	UK	L	UL	L	
Equipment	71			L	L	UL	UL	UK	UL	UL	L	
Fueling	26			UK	L	UK	N	N	N	N	L	
General Industrial	44			L	L	UK	UK	UK	UK	UK	L	
General Retail	16			UL	UL	L	UL	UL	UL	UL	UL	
Golf	9			UK	UK	UK	UK	L	UK	UL	UK	
Health Services	1			N	UL	L	UK	L	UL	UK	L	
Manufacturing	95			L	L	L	UL	UL	UL	UL	L	
Metal	36			L	L	UK	UK	UK	UL	UL	L	
Nursery	104			L	UL	L	L	L	L	UL	UL	
Stone & Aggregates	54			L	L	L	UL	UL	UL	UL	L	
Storage & Warehousing	166			L	L	L	UL	UL	UL	UL	L	
Municipal	High		Non-High		N	N	L	N	N	UK	UL	N
	68		50									
Construction	High		Medium		UL	UL	L	UL	UL	UL	L	UL
	30		50									
Residential	12,977 acres			L	L	L	L	L	L	L	L	

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

- 1: Prepared based on the WURMP Copermittees FY 2011 JURMP Annual Reports. The methodology for developing the tables is included as [Appendix A](#) to this report
- 2: Other sources are not reported in this table including: Land Development and Non-inventoried Businesses
- 3: Pollutant Source Loading Potential taken from LTEA 2011; N = None, UK = Unknown, UL = Unlikely, L = Likely

Table 3-6 Pollutant Generating Sources – 904.6 Escondido Creek Hydrologic Area¹

Inventory Sites/Facilities ²	Quantities			Pollutant Source Loading Potential ³							
				Metals	Oil & Grease	Sediment	Pesticides	Nutrients	Bacteria/Pathogens	Dissolved Minerals	Organics
Agriculture	3			L	UL	L	L	L	L	UK	UL
Animal	25			N	UL	L	UK	L	L	N	L
Automotive	505			L	L	UL	UL	UK	UL	L	L
Contractor	390			UL	UL	L	UL	UL	UL	UL	UL
Food Establishment	433			N	L	UL	UK	UK	L	UL	L
Equipment	41			L	L	UL	UL	UK	UL	UL	L
Fueling	44			UK	L	UK	N	N	N	N	L
General Industrial	52			L	L	UK	UK	UK	UK	UK	L
General Retail	63			UL	UL	L	UL	UL	UL	UL	UL
Golf	4			UK	UK	UK	UK	L	UK	UL	UK
Health Services	11			N	UL	L	UK	L	UL	UK	L
Institutional	17			L	UK	UK	UK	UK	UL	UK	UK
Manufacturing	99			L	L	L	UL	UL	UL	UL	L
Metal	51			L	L	UK	UK	UK	UL	UL	L
Mining	7			L	UK	L	UK	UK	UL	UK	UK
Nursery	32			L	UL	L	L	L	L	UL	UL
Stone & Aggregates	32			L	L	L	UL	UL	UL	UL	L
Storage & Warehousing	84			L	L	L	UL	UL	UL	UL	L
Municipal	High	Non-High		N	N	L	N	N	UK	UL	N
	39	63									
Construction	High	Medium	Low	UL	UL	L	UL	UL	UL	L	UL
	34	52	174								
Residential	18,910 acres			L	L	L	L	L	L	L	L

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

1: Prepared based on the WURMP Copermittees FY 2011 JURMP Annual Reports. The methodology for developing the tables is included as **Appendix A** to this report

2: Other sources are not reported in this table including: Land Development and Non-inventoried Businesses

3: Pollutant Source Loading Potential taken from LTEA 2011; N = None, UK = Unknown, UL = Unlikely, L = Likely

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4 IMPLEMENTATION OF ACTIVITIES

4.1 JURMP AND WATERSHED ACTIVITIES

The Carlsbad WURMP Copermittees are responsible for implementing JURMP activities throughout their jurisdictions in an effort to improve the water quality of urban runoff. Many of these activities have historically been reported only in jurisdictional annual reports. The Copermittees recognize that in order to assess the effectiveness of urban runoff management programs, it is important to track and report the data and information on a watershed basis.

Copermittees implemented activities in the watershed as part of the JURMP and WURMP programs. In an effort to report on the Copermittees' activities performed in the WMA, data was collected for these activities on an HA basis. The data and information is not comprehensive and for some data sets, estimates were used to generate quantities for the activities – this is explained in [Appendix A](#) of the report.

In addition to the JURMP activities, the Carlsbad WURMP Copermittees are responsible for identifying and implementing watershed water quality activities that address the HPWQPs in the WMA. These activities may be implemented individually or collectively at the regional, watershed, or jurisdictional level. The activity selection process is described fully in the March 2008 Carlsbad WURMP. The Copermittees believe it is an important step towards integrating jurisdictional and watershed activities and reporting to best assess and plan for activities that address the identified HPWQPs on an HA basis.

The tables below represent the Copermittees' efforts towards reporting urban runoff management activities on a watershed basis, e.g., reporting of Copermittee activities regardless of jurisdiction-specific program labels. Reporting as many jurisdictional and watershed urban runoff management activities as feasible on a watershed basis will assist in the effectiveness assessment when attempting to connect sources to urban runoff water quality problems and activities to urban runoff water quality improvements.

The effectiveness assessments for these activities are presented on the Activity Implementation Sheets ([Appendix B](#)) and are summarized in the Section 5 – Effectiveness Assessment.

Table 4-1 JURMP and WURMP Activities – 904.1 Loma Alta Hydrologic Area

Activity		Results # of Inspections: (Inventory #)	High Priority Water Quality Problem	
			Bacteria/ Pathogens	Nutrients
Inspections	Animal	3: (7)	✓	✓
	Cemetery	1: (1)		✓
	Food Establishment	122: (126)	✓	
	Health Services	2: (15)		✓
	Nursery	3: (4)	✓	✓
	TCBMPs	186: (294)	✓	✓
Street Sweeping (Tons Removed)		521.4	✓	✓
Basins/Inlets/Ditches/MS4 (Tons Removed)		229.4	✓	✓
CHU-WQA2	Loma Alta Creek Ultraviolet Radiation Storm Water Treatment Facility		✓	
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution		✓	✓
CHU-WQA22	Loma Alta Water Quality Monitoring Program		✓	✓
CHU-WQEA9	Residential Composting Workshop			✓
CHU-WQEA11	Focused Equestrian Outreach		✓	✓
CHU-WQEA13	Residential Smart Landscape Evaluation Program		✓	✓

Table 4-2 JURMP and WURMP Activities – 904.2 Buena Vista Creek Hydrologic Area

Activity		Results # of Inspections: (Inventory #)	High Priority Water Quality Problem	
			Bacteria/Pathogens	
Inspections	Agriculture	0: (1)	✓	
	Animal	0: (6)	✓	
	Food Establishment	282: (404)	✓	
	Nursery	6: (28)	✓	
	TCBMPs	98: (164)	✓	
Street Sweeping (Tons Removed)		795.2	✓	
Basins/Inlets/Ditches/MS4 (Tons Removed)		1,667.1	✓	
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution		✓	
CHU-WQEA11	Focused Equestrian Outreach		✓	
CHU-WQEA13	Residential Smart Landscape Evaluation Program		✓	

Table 4-3 JURMP and WURMP Activities – 904.3 Agua Hedionda Hydrologic Area

Activity		Results # of Inspections: (Inventory #)			High Priority Water Quality Problem		
					Bacteria/ Pathogens	Nutrients	Sediment
Inspections	Agriculture	4: (6)			✓	✓	✓
	Animal	1: (5)			✓	✓	✓
	Contractor	15: (59)					✓
	Food Establishment	108: (183)			✓		
	General Retail	44: (53)					✓
	Golf	3: (3)				✓	
	Health Services	7: (8)				✓	✓
	Manufacturing	20: (91)					✓
	Nursery	12: (66)			✓	✓	✓
	Stone & Aggregates	7: (15)					✓
	Storage & Warehousing	16: (71)					✓
	TCBMPs	300: (558)			✓	✓	✓
	Construction	High	Medium	Low			✓
		423: (22)	263: (20)	353: (69)			
Municipal	High		Non-High			✓	
	52: (52)		2: (20)				
Street Sweeping (Tons Removed)		531.8			✓	✓	✓
Basins/Inlets/Ditches/MS4 (Tons Removed)		995.4			✓	✓	✓
CHU-WQA8	Nitrate Source Identification and Abatement: Buena Creek					✓	
CHU-WQA15	Water Quality Treatment Facility @ Palomar Airport					✓	✓
CHU-WQA16	Agua Hedionda Creek Restoration – SR-02+						✓
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution				✓	✓	✓
CHU-WQEA11	Focused Equestrian Outreach				✓	✓	✓
CHU-WQEA13	Residential Smart Landscape Evaluation Program				✓	✓	

Table 4-4 JURMP and WURMP Activities – 904.5 San Marcos Hydrologic Area

Activity		Results # of Inspections: (Inventory #)	High Priority Water Quality Problem	
			Bacteria/ Pathogens	Nutrients
Inspections	Animal	6: (48)	✓	✓
	Cemetery	0: (1)		✓
	Food Establishment	164: (526)	✓	
	Golf	6: (9)		✓
	Health Services	0: (1)		✓
	Nursery	11: (104)	✓	✓
	TCBMPs	597: (1,090)	✓	✓
Street Sweeping (Tons Removed)		1,805.6	✓	✓
Basins/Inlets/Ditches/MS4 (Tons Removed)		438.6	✓	✓
CHU-WQA12	Upper San Marcos Creek Watershed/Lake San Marcos Nutrient Management Plan			✓
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution		✓	✓
CHU-WQA18	Upper San Marcos Creek Nutrient Management Plan – Parks Component			✓
CHU-WQA19	Upper San Marcos Creek Nutrient Management Plan – Golf Courses Component			✓
CHU-WQA20	Upper San Marcos Creek Nutrient Management Plan – Agriculture Component			✓
CHU-WQA21	Upper San Marcos Creek Nutrient Management Plan – Monitoring Component			✓
CHU-WQA23	San Diego County <i>Enterococcus</i> Regrowth Study		✓	
CHU-WQEA8	Upper San Marcos Creek Nutrient Management Plan – Residential Component			✓
CHU-WQEA10	Ocean Friendly Garden Workshop Series		✓	✓
CHU-WQEA11	Focused Equestrian Outreach		✓	✓
CHU-WQEA12	Cottonwood Creek Watershed Interpretive Signage		✓	

Table 4-5 JURMP and WURMP Activities – 904.6 Escondido Creek Hydrologic Area

Activity		Results # of Inspections: (Inventory #)			High Priority Water Quality Problem		
					Bacteria/ Pathogens	Nutrients	Sediment
Inspections	Agriculture	1: (3)			✓	✓	✓
	Animal	8: (25)			✓	✓	✓
	Contractor	219: (390)					✓
	Food Establishment	282: (433)			✓		
	General Retail	32: (63)					✓
	Golf	1: (4)				✓	
	Health Services	7: (11)				✓	✓
	Manufacturing	59: (99)					✓
	Mining	7: (7)					✓
	Nursery	3: (32)			✓	✓	✓
	Stone & Aggregates	26: (32)					✓
	Storage & Warehousing	48: (84)					✓
	TCBMPs	297: (520)			✓	✓	✓
	Construction	High	Medium	Low			✓
		619: (34)	485: (52)	1,237: (174)			
Municipal	High		Non-High			✓	
	39: (39)		22: (63)				
Street Sweeping (Tons Removed)		1,056.1			✓	✓	✓
Basins/Inlets/Ditches/MS4 (Tons Removed)		662.1			✓	✓	✓
CHU-WQA10	Pet Waste Bag Dispenser Program in County Parks			✓	✓		
CHU-WQA11	Land Acquisitions			✓	✓	✓	
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution			✓	✓	✓	
CHU-WQEA5	LID Features in San Elijo Nature Center			✓	✓	✓	
CHU-WQEA11	Focused Equestrian Outreach			✓	✓	✓	

4.2 WATERSHED EDUCATION ACTIVITIES

This section describes activities implemented by the Carlsbad WURMP Copermittees during the FY 2011 reporting period to enhance the general public’s understanding of basic watershed principles and sources of water pollution. The Copermittees are responsible for identifying and implementing Watershed Education Activities that address the HPWQPs in the Carlsbad WMA. The activity selection process is described fully in the March 2008 Carlsbad WURMP.

The Copermittees continue to make progress in developing and implementing programs aimed at improving stormwater and urban runoff quality in the watershed. **Table 4-6** below lists the watershed education activities implemented during FY 2011 by the Copermittees. Details of the each activity can be found on the Activity Implementation Sheets located in **Appendix B**.

Table 4-6. Watershed Education Activities Implemented During FY 2011

ID #	Activity/Project Name
CHU-WQEA5	LID Features in San Elijo Nature Center
CHU-WQEA8	Upper San Marcos Creek Nutrient Management Plan – Residential Component
CHU-WQEA9	Residential Composting Workshop
CHU-WQEA10	Ocean Friendly Gardens Workshop Series
CHU-WQEA11	Focused Equestrian Outreach
CHU-WQEA13	Residential Smart Landscape Evaluation Program
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution

The effectiveness assessments for these activities are presented on the Activity Implementation Sheets ([Appendix B](#)) and are summarized in the Section 5 – Effectiveness Assessment.

4.3 PUBLIC PARTICIPATION ACTIVITIES

The Watershed Copermittees are responsible for implementing a watershed-specific public participation mechanism within the watershed. The mechanism encourages participation from other organizations within the watershed which could include other agencies, private companies, non-governmental organizations, environmental groups, etc. The Copermittees use several mechanisms to engage the public and receive input, including outreach events. Below is a summary of these mechanisms where interaction with the public is the primary function.

4.3.1 PROJECT CLEAN WATER

Project Clean Water (PCW) is a water quality resource for the San Diego County region including Municipal NPDES Copermittees and the public. PCW, initiated in July 2000, established a framework for the broad-based and collaborative development of solutions to local water quality problems. PCW seeks to actively involve a multitude of stakeholders in exploring water quality problems, their causes, and their solutions. It was formed under the guidance of a Technical Advisory Committee made up of local stormwater-related professionals.

One component of PCW is the PCW website which is accessible to the public and is promoted for use by the public to gather information about San Diego County watersheds. There are several web pages that provide information on San Diego’s Watersheds, programs and laws related to urban runoff, education information and how to report water pollution. This website provides Best Management Practices information for both residential and industrial/commercial audiences (<http://www.projectcleanwater.org/bmp/>).

PCW features a page devoted to the Carlsbad WMA, with details on the watershed, major pollutants, and organizations related to water quality. Additionally the webpage also offers links to relevant documents such as the WURMP and WURMP Annual Updates. During the FY 2011 reporting period, revisions were made to update the content and documents available via the site. During FY 2011 the hits for the Carlsbad Watershed page totaled 1,357 and there were also 510 hits on the Carlsbad WURMP document. A monthly breakdown of the hits can be found in the tables below.

Table 4-7 Numbers of Hits on the Project Clean Water Carlsbad WMA Web Site

July 10	Aug 10	Sep 10	Oct 10	Nov 10	Dec 10	Jan 11	Feb 11	March 11	April 11	May 11	June 11	Total
130	147	141	181	159	171	73	84	80	62	51	78	1,357

Table 4-8 Numbers of Hits on the Project Clean Water Carlsbad WURMP Web Site

July 10	Aug 10	Sep 10	Oct 10	Nov 10	Dec 10	Jan 11	Feb 11	March 11	April 11	May 11	June 11	Total
43	45	47	62	64	69	31	31	34	27	25	32	510

The Carlsbad WURMP Copermittees are supportive of these outreach activities and will be involved where applicable and feasible.

4.3.2 REGIONAL EDUCATION GROUP

Carlsbad WURMP Copermittees worked in cooperation with the Regional Education and Residential Sources workgroup.

Outreach Events

The Carlsbad Copermittees collaborated to staff informational booths at special events throughout the watershed. During this reporting period Copermittees staffed booths at the following events and disseminated storm water related educational materials.

- June 11 - July 5, 2010 – San Diego County Fair
- July 31 - August 1, 2010 – Vista Rod Run
- August 12, 2010 – OMWD Water Conservation Expo
- August 24, 2010 – Surfrider Ocean Friendly Gardens Basics Course
- August 28, 2010 – Beach Blanket Movie Night
- September 11, 2010 – Grape Day Festival
- September 16 - September 23, 2010 – Encinitas Pollution Prevention Week
- September 22, 2010 – Educators’ Night Out (Teachers Fair)
- September 25, 2010 – Coastal Cleanup Day and Creek Cleanup
- September 25, 2010 – Stars in the Park Movie Nights
- September 26, 2010 – Surfrider Ocean Friendly Gardens Site Evaluation
- September 27, 2010 – School District Liaison Committee (Water Education Resources)
- October 1 - October 2, 2010 – Cardiff Surf Classic & Green Beach Fair
- October 9, 2010 – Alta Vista Gardens Fall Festival
- October 16, 2010 – California Friendly Landscape Workshop
- October 16, 2010 – Stars in the Park Movie Nights
- October 23, 2010 – Stars in the Park Movie Nights
- October 24, 2010 – Ocean Friendly Gardens GAP Workday
- December 16, 2010 – Day Without a Bag (Countywide)
- January 1, 2011 – Spanish Storm Water Calendar Distribution
- January 25, 2011 – Kids Conference on Watersheds
- January 31, 2011 – Mission Estancia Elementary School Presentation
- February 2011 – Girl Scout Cookie Drive (Water Conservation Fliers Distributed)
- February 9, 2011 – San Diego County High Tech Fair
- March 12, 2011 – Oceanside Green Fair
- March 20, 2010 – Paws in the Park
- March 26, 2011 – Solana Beach Green Fair

- March 26, 2011 – Kids Day at the Flower Fields
- April 17, 2011 – Fallbrook Avocado Festival
- April 22, 2011 – La Costa Canyon High School Earth Day
- April 23, 2011 – Alta Vista Gardens Earth Day
- April 30, 2011 – Creek to Bay Cleanup
- April 30, 2011 – Encinitas Garden Festival
- May 20, 2011 – Encinitas Public Works Day
- May 29, 2011 – City of Vista Strawberry Festival
- June 4, 2011 – Carlsbad Beach Fest
- June 4 - June 5, 2011 – Fiesta Del Sol
- June 5, 2011 – Encinitas Environment Day
- June 17, 2011 – Passport to Vista
- June 18, 2011 – San Diego County Fair – Enviro Fair

Educational Materials Distributed

The Carlsbad Watershed Copermittees continued the distribution of the following items at special events, inspections, classroom presentations and other public interactive venues that were produced by the North County Storm Water Program during previous reporting periods:

- Construction brochure highlighting construction BMPs for large or small scale developments
- Construction Demolition and Recycling Guide
- BMP posters specifically for restaurant activities
- BMP posters specifically for automotive repair and auto body repair activities
- General BMP brochure for residents
- Door hangers for residents with observed violations
- Hotline magnets, key chains, hand towels, reusable bags, click-message pens and pencils for the residential community
- San Diego County IPM program materials, including English and Spanish IPM Pest Tip Cards
- Informational letters (Solid Waste, Storm Water BMPs, Coastal Cleanup Day, Household Hazardous Waste/Used Oil, Rainy Season Preparations, Pool BMPs)
- Personal pet waste bag dispensers
- Storm water coloring book and crayons

Table 4-9 provides a summary of the educational materials distributed during the reporting period.

Table 4-9 Summary of FY 2011 Educational Materials Distributed

Educational Material	Approximate Quantity Distributed
10 Simple Ways to Protect the Ocean Brochure	361
Automotive BMPs Brochure	24
City Authorization Letter Copy	296
Clean Water Hotline Magnet	26
Clean Water Program Hand Towels	40
Construction Brochures	122
Door Hangers	150
FOG Brochures and Posters	193
Grease Bin Handout	9
Green Wrench Guide	23
Green Wrench Guide (Spanish)	9
Industrial/Commercial Brochure	78
Informational Handouts	3
Inspection Notification	289
Junior Lifeguard Field Manual	1,000
Key Chains	97
NOI Handout	51
NONA/NEC Paperwork	87
Pencils	337
Pesticide Management	57
Residential BMPs Brochure	25
Reusable Bags	30
Think Blue San Diego Region Calendar (Spanish)	300
Think Blue San Diego Region Coloring Books	100
What's Cookin' BMP Guide	39
What's Cookin' BMP Guide (Spanish)	18

4.3.3 RIVER, CREEK AND BEACH CLEANUP EVENTS

River, creek, and beach cleanup events are an excellent way to get the public involved with water quality programs and to educate them about how pollutants, including trash, reach the waterways through the storm drain system. During this reporting period there were two (2) cleanup events held at twenty-four (24) different sites throughout the Carlsbad WMA. 3,302 volunteers removed approximately 39,847.5 pounds of trash and recyclables from the waterways. **Table 4-10** presents the locations, volunteers, and collections at the cleanup events.

Table 4-10 Summary of FY 2011 Cleanup Events

Date	Name	Location	# of Participants	# of Pounds Removed	Hydrologic Area
9/25/2010	Coastal Cleanup Day	Buccaneer Park, Oceanside	362	1,006	Loma Alta (904.1)
		Buena Vista Creek (3 sites), Oceanside	61	3,000	Buena Vista (904.2)
		Frazee Beach, Carlsbad	179	140	Buena Vista (904.2)
		Tamarack State Beach, Carlsbad	102	74	Agua Hedionda (904.3)
		Buena Creek, Vista	167	1,062	Agua Hedionda (904.3)
		Ponto Beach, Carlsbad	248	114	San Marcos (904.5)
		Carlsbad State Beach, Carlsbad	75	182.5	San Marcos (904.5)
		Beacon's Beach, Encinitas	90	70.5	San Marcos (904.5)
		Swami's Beach, Encinitas	125	323	San Marcos (904.5)
		Moonlight Beach, Encinitas	100	145	San Marcos (904.5)
		San Elijo State Beach, Encinitas	75	108.5	Escondido (904.6)
		Seaside Beach, Encinitas	152	134	Escondido (904.6)
		San Elijo Lagoon Rios Trailhead, Solana Beach	52	244	Escondido (904.6)
		Dixon Lake, Escondido	242	228	Escondido (904.6)
4/30/2011	Creek to Bay Cleanup	Buccaneer Beach, Oceanside	219	1,539	Loma Alta (904.1)
		Loma Alta Creek (3 sites), Oceanside	60	12,000	Loma Alta (904.1)
		Frazee Beach, Carlsbad	24	59	Buena Vista (904.2)
		Tamarack State Beach, Carlsbad	94	197	Agua Hedionda (904.3)
		Ponto Beach, Carlsbad	283	443	San Marcos (904.5)
		Beacon's Beach, Encinitas	60	112	San Marcos (904.5)
		Moonlight Beach, Encinitas	71	203	San Marcos (904.5)
		San Marcos Creek, San Marcos	45	11,320	San Marcos (904.5)
		San Elijo State Beach, Encinitas	102	275	Escondido (904.6)
		Cardiff State Beach, Encinitas	65	170	Escondido (904.6)
		Escondido Creek, Escondido	144	6,500	Escondido (904.6)
		Dixon Lake, Escondido	58	118	Escondido (904.6)
		Lake Wohlford, Escondido	47	80	Escondido (904.6)

Table 4-11 below provides a summary of the number of sites, number of volunteers and pounds of debris removed within each Carlsbad hydrologic area during the cleanup events.

Table 4-11 Summary of FY 2011 Cleanup Events by HA

Hydrologic Area	# of Sites	# of Volunteers	Pounds of Debris Removed
Loma Alta (904.1)	4	641	14,545
Buena Vista (904.2)	4	264	3,199
Agua Hedionda (904.3)	2	363	1,333
San Marcos (904.5)	6	1,097	12,913
Escondido (904.6)	8	937	7,857.5
Totals	24	3,302	39,847.5

4.4 COLLABORATIVE LAND USE PLANNING EFFORTS

The Carlsbad Watershed 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.

4.4.1 CROSS-JURISDICTIONAL COMMUNICATION

The primary means of collaborative land use planning is the clear and timely communication of pending land use decisions among the Carlsbad Watershed 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 (MOU) 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 Carlsbad Watershed 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 occurring in adjacent jurisdictions. Through enhanced communication and strong relationships, the Copermittees are able to better address watershed needs as a whole.

4.5 5-YEAR STRATEGIC PLAN

4.5.1 NEW WATERSHED ACTIVITIES (FY 2011 AND FUTURE YEARS)

Activity information includes a description of how each activity was selected, and how the activities are expected to abate sources and reduce pollutant discharges that may be causing the identified HPWQPs in the WMA. FY 2011 Watershed Activity Sheets can be found in **Appendix B**.

Each activity on the Watershed Activities List is fully described in an Activity Sheet and includes the following information:

1. A description of the activity;

2. A time schedule for implementation of the activity, including key milestones;
3. An identification of the specific responsibilities of Watershed Copermittees in completing the activity;
4. A description of how the activity will address the identified HPWQP(s) of the watershed;
5. A description of how the activity is consistent with the collective watershed strategy;
6. A description of the expected benefits of implementing the activity; and
7. A description of how implementation effectiveness will be measured.

The Watershed Copermittees will implement identified Watershed Activities pursuant to the proposed schedule. For each Permit year, no less than two Watershed Water Quality Activities will be in an active implementation phase. A Watershed Water Quality Activity is in an active implementation phase when significant pollutant load reductions, source abatement, or other quantifiable benefits to discharge or receiving water quality can reasonably be established in relation to the watershed's HPWQP(s). Watershed Water Quality Activities that are capital projects are in active implementation for the first year of implementation only.

4.5.2 UPDATED 5-YEAR STRATEGIC PLAN

This section describes the results of the Collective Watershed Strategy process described in the 2008 Carlsbad WURMP. The strategy was applied at the hydrologic area (HA) level to focus the Copermittees' activities at a scale where actions and results can be reasonably measured.

To reiterate, the basic strategy applied was to first identify water quality problems (where sufficient data is available). From those water quality problems, the Copermittees reviewed water quality data and used best professional judgment to determine the HPWQPs in each HA.

The second step was to identify the sources that are most likely to contribute (having the highest TTWQ ratings) to the HPWQPs for each HA-HPWQP combination in the WMA. Based on the available data, the Copermittees could then make appropriate management decisions when selecting appropriate watershed water quality and education activities.

Where sufficient data was not available to make a determination about the state of water quality in an HA, the Copermittees used available information to identify where additional water quality monitoring may be conducted to effectively determine the level of water quality problems.

The updated 5-year strategic plan presented below is intended to supersede the earlier versions presented in the 2008 Carlsbad WURMP and the FY 2008-FY 2010 Carlsbad WURMP Annual Reports previously submitted.

Table 4-12 Updated 5-Year Strategic Plan

Activity/Project Name		Jurisdiction(s)	Watershed Priorities			Implementation Schedule			
			Bacteria	Nutrients	Sediment	FY 2011	FY 2012	FY 2013	Future Fiscal Year(s)
Watershed Water Quality Activities									
CHU-WQA2	Loma Alta Creek Ultraviolet Radiation Storm Water Treatment Facility	OCEANSIDE	✓			A	A	A	A
CHU-WQA6	Escondido Creek Restoration	ESCONDIDO			✓	Completed – No longer reported			
CHU-WQA7	Stormwater Quality Master Plans for Special Drainage Fee Areas	COUNTY	TBD			P	P	WQI	WQI
CHU-WQA8	Nitrate Source Identification and Abatement: Buena Creek	COUNTY		✓		WQI	WQI	WQI	WQI
CHU-WQA10	Pet Waste Bag Dispenser Program in County Parks	COUNTY	✓	✓		WQI	WQI	WQI	WQI
CHU-WQA11	Land Acquisitions	COUNTY	✓	✓	✓	WQI	WQI	WQI	WQI
CHU-WQA12	Upper San Marcos Creek Nutrient Management Plan	SM/COUNTY/ESC		✓		WQI	WQI	WQI	WQI
CHU-WQA14	Water Quality Monitoring in Agua Hedionda Creek Watershed	COUNTY	✓	✓	✓	Completed – No longer reported			
CHU-WQA15	Water Quality Treatment Facility @ McClellan-Palomar Airport	COUNTY		✓	✓	M	M	M	-
CHU-WQA16	Agua Hedionda Creek Restoration – SR-02+	VISTA			✓	P	P	WQI	WQI
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution	COUNTY	✓	✓	✓	WQI	P	WQI	-
CHU-WQA18	Upper San Marcos Creek Nutrient Management Plan – Parks Component	SM/COUNTY/ESC		✓		-	WQI	WQI	-
CHU-WQA19	Upper San Marcos Creek Nutrient Management Plan – Golf Courses Component	SM/COUNTY/ESC		✓		WQI	WQI	WQI	-
CHU-WQA20	Upper San Marcos Creek Nutrient Management Plan – Agriculture Component	SM/COUNTY/ESC		✓		WQI	WQI	WQI	-
CHU-WQA21	Upper San Marcos Creek Nutrient Management Plan – Monitoring Component	SM/COUNTY/ESC		✓		WQI	WQI	WQI	-
CHU-WQA22	Loma Alta Water Quality Monitoring Program	OCEANSIDE/ VISTA	✓	✓		M	-	-	-
CHU-WQA23	San Diego County <i>Enterococcus</i> Regrowth Study	ENCINITAS	✓			M	M	-	-

Table 4-12 Updated 5-Year Strategic Plan - Continued

Activity/Project Name		Jurisdiction(s)	Watershed Priorities			Implementation Schedule			
			Bacteria	Nutrients	Sediment	FY 2011	FY 2012	FY 2013	Future Fiscal Year(s)
Watershed Education Activities									
CHU-WQEA3	Water Quality Runoff Management and Agricultural Waiver Workshop for Nurseries and Agricultural Businesses	ALL	✓	✓	✓	P	P	P	-
CHU-WQEA5	LID Features in San Elijo Nature Center	COUNTY	✓	✓	✓	WE	WE	WE	-
CHU-WQEA7	Bioassessment Training for High School Students	OCEANSIDE	✓	✓	✓	Completed – No longer reported			
CHU-WQEA8	Upper San Marcos Creek Nutrient Management Plan – Residential Component	SM/COUNTY/ESC		✓		WE	WE	WE	-
CHU-WQEA9	Residential Composting Workshop	OCEANSIDE/ COUNTY/VISTA		✓	✓	WE	-	-	-
CHU-WQEA10	Ocean Friendly Gardens Workshop Series	ENCINITAS	✓	✓	✓	WE	-	-	-
CHU-WQEA11	Focused Equestrian Outreach	COUNTY	✓	✓	✓	WE	WE	WE	-
CHU-WQEA12	Cottonwood Creek Watershed Interpretive Signage	ENCINITAS	✓			P	WE	A	-
CHU-WQEA13	Residential Smart Landscape Evaluation Program	OCEANSIDE	✓	✓		WE	-	-	-
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution	COUNTY	✓	✓	✓	WE	P	WE	-

- WQI = Watershed Water Quality Activity Implementation (Active Implementation)
- I = Watershed Water Quality Activity Implementation (No WURMP Credit)
- A = Watershed Activity Assessment (No WURMP Credit)
- P = Watershed Activity Planning (No WURMP Credit)
- WE = Watershed Education Activity (Active Implementation)

- E = Watershed Education Activity (No WURMP Credit)
- PP = Watershed Public Participation Activity
- M = Water Quality Monitoring Activity (No WURMP Credit)
- S = Source ID/Characterization Activity (No WURMP Credit)

5 EFFECTIVENESS ASSESSMENT

This section summarizes the effectiveness of all of the WURMP activities conducted during FY 2011. In addition, there is an effectiveness assessment of the collective WURMP implementation.

The activity summary sheets presented in **Appendix B** include effectiveness assessment summaries for each water quality and education activity, as required in the Permit, I.2.a.(1).

5.1 PERMIT COMPLIANCE (LEVEL 1)

A basic compliance assessment is presented in **Table 5-1**. This table describes permit requirements set forth in the Permit, whether or not compliance was demonstrated by the watershed Copermittees in FY 2011, and where in this report, required compliance points are fulfilled or described.

Table 5-1 Permit Compliance

Targeted Outcome	Measure	Report Section
Update any watershed maps.	No changes	1
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 HPWQP(s) during the reporting period.	Completed	2
Identify the likely sources, pollutant discharges, and/or other factors causing the HPWQPs within the watershed.	Completed	3
Update list of potential Watershed Water Quality Activities.	Completed	4
Identify and describe the Watershed Water Quality Activities implemented by each Copermittee during the reporting period.	Completed	4
Update list of potential Watershed Education Activities.	Completed	4
Identify and describe the Watershed Education Activities implemented by each Copermittee during the reporting period.	Completed	4
Describe the public participation mechanisms used during the reporting period and the parties that were involved.	Completed	4
A description of Copermittee collaboration efforts including meeting as the Carlsbad WMA WURMP Workgroup.	Completed	1
Describe the efforts implemented to encourage collaborative, watershed-based, land-use planning.	Completed	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 in meeting the TMDL numeric targets and WLAs, which incorporates the results of the effectiveness assessment, compliance monitoring, and an evaluation of additional efforts needed to date.	Not applicable at this time.	N/A

As shown in the table, the Copermittees were in compliance with all WURMP related Permit requirements during FY 2011.

5.2 MONITORING ASSESSMENT

Currently, the Copermittees are relying on the regional MS4 monitoring program for their primary source of water quality data. The regional program elements are collecting data however, because the scope and scale are limited, the data gathered may not provide sufficient data for use in selecting or assessing the effectiveness of activities.

5.2.1 MS4 SUMMARY

Current ambient monitoring efforts in the MS4 include the Dry Weather, MS4, and CSDM outfall monitoring programs. The Copermittees are currently participating in a regional portion of the MS4 outfall program that will collect and provide data in the MS4 during storm events. The scope of this program is limited and may not provide local data within each HA. It is expected however, that over time, enough data will be collected to characterize storm water discharges from the MS4 during storm events. Currently, there are six (6) random wet weather MS4 locations in the WMA, four (4) in the San Marcos HA and one (1) in each the Buena Vista Creek and Encinas HAs.

5.2.2 RECEIVING WATER SUMMARY

Monitoring within the receiving waters is accomplished through the Regional Monitoring (MLS/TWAS), CSDM, Bight Program, and other special studies. Currently MLSs are located at the base of Agua Hedionda and Escondido Creeks; TWAS are located at the base of Loma Alta and Buena Vista Creeks and upstream in San Marcos Creek. Currently, there are no receiving water monitoring locations in the Encinas HA. Historical MLSs will remain as located. The intent of the TWASs was to be able to relocate stations in order to collect more relevant water quality information. The watershed group will consider future locations of the TWAS for the upcoming monitoring years.

5.3 WATERSHED ACTIVITY ASSESSMENTS

Each activity summary sheet in **Appendix B** of the WURMP identifies specific targeted outcomes (Levels 1-6) that will be assessed and the measures and methods that will be used to gauge activity effectiveness. Each watershed activity is unique and its impacts on water quality are equally distinctive. As a result, measurable outcomes do not always follow a linear path (assessing effectiveness at each of the six outcome levels). For example, a capital project may result in pollutant load reductions (Level 4), but may not have any bearing on changes in the awareness or behavior of a target population (Levels 2 and 3). It is also unlikely that the implementation of an individual watershed activity would be measurable at levels 5 or 6. Levels 5 and 6 outcomes are typically measurable through cumulative assessments. **Tables 5-2** through **5-6** below, summarize the assessments of the water quality and education activities, on a hydrologic area basis, to provide a snapshot of the overall effectiveness of the watershed activities.

In addition to the WURMP activities included in the tables, the WURMP Copermittees are presenting the JURMP activities that are related to the HPWQPs in each hydrologic area. It is important to note that not all JURMP activities are included in this presentation. For complete assessment of JURMP activities, the reader may review each WURMP Copermittees' JURMP Annual Reports.

Table 5-2 Summary of Implemented Activities for FY 2011 – 904.1 Loma Alta Hydrologic Area

Activity:	Type:	Priority Problems Addressed:	Level Outcomes:	Pollutant Load Reduction, Source Abatement or Other Benefit Derived:
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3, and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2011 included animal facilities, restaurants, and nurseries. Of the total 137 bacteria sources inventoried, 92% are restaurants. Approximately 97% of the restaurants were inspected, and overall 93% of the likely bacteria sources inventoried were inspected.
JURMP Industrial/Commercial Inspections	Water Quality	Nutrients	Levels 1, 3, and 4	Sources categorized as likely to produce nutrients inventoried under the JURMP program during FY 2011 included animal facilities, cemeteries, health services, and nurseries. Of the total 27 nutrient sources inventoried, 56% are health service facilities, while only 15% are nurseries. Approximately 13% of the health service facilities and 75% of the nurseries in the HA were inspected. Overall, 33% of the likely nutrient sources inventoried were inspected.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria and Nutrients	Levels 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria and nutrient sources. During FY 2011, 521 tons of material was removed from streets via street sweeping and 229 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, brow ditches, and open channels.
Loma Alta Creek UV Facility	Water Quality	Bacteria	Level 4	Dry weather bacteria loads reduced via treatment at base of hydrologic area
Residential Rain Barrel Subsidies and Distribution	Water Quality	Bacteria and Nutrients	Levels 1 and 4	Residential rain barrel subsidy promoting outdoor water conservation and runoff reduction through public outreach.
Loma Alta Water Quality Monitoring Program	Water Quality	Bacteria and Nutrients	Level 1	Watershed monitoring program for the Loma Alta Creek and its major tributaries. The first year of data will be used as a baseline in anticipation of the nutrient and bacteria TMDLs that will be created and implemented at the slough.
Residential Composting Workshop	Watershed Education	Nutrients	Levels 1, 2, and 3	Using compost as a natural fertilizer will reduce the amount of chemical fertilizer that residents use in their landscapes, thereby reducing a potential source of nutrients. Erosion and sedimentation can also be reduced through the proper application of compost.
Focused Equestrian Outreach	Watershed Education	Bacteria and Nutrients	Levels 1, 2, and 3	Controlling animal waste and educating the public on BMPs will result in the reduction of pollutant loads, particularly bacteria and nutrients.
Residential Smart Landscape Evaluation Program	Watershed Education	Bacteria and Nutrients	Levels 1 and 2	Site-specific education will help residents and multi-family property managers to reduce and eliminate irrigation runoff from their property.

Loma Alta HA Discussion

Major land use in the HA includes residential and open space, totaling approximately 53 percent of the land use in Loma Alta. Transportation, industrial/commercial, and municipal land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria and nutrients, as these are identified as the HPWQPs in the HA.

Residential sources of bacteria and nutrients include activities such as over-irrigation, application of fertilizers, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. With the implementation of the Ultra Violet Treatment Facility (UV Facility), CHU-WQA2, bacteria is removed from the receiving waters prior to discharge to the Pacific Ocean. JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate bacteria. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs.

Open space contributions of bacteria are most often uncontrollable and MS4 programs are not typically responsible for mitigating bacteria loads from this land use. However, contributions from open space can be significant. In the Loma Alta HA, the UV Facility is an excellent BMP to ensure that uncontrollable bacteria contributions to the receiving waters have lessened impact to public health during dry weather.

Other less predominant sources of bacteria in the HA include transportation, industrial/commercial, and municipal land uses. While the UV Facility removes the bacteria from these sources, it does not address the sources themselves. However, through implementation of the JURMP Activities, these sources are addressed. Examples of JURMP Activities addressing these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

Through the implementation of JURMP Activities addressing the sources identified above, the WURMP Copermittees have effectively reduced the amount of pollutants from entering the receiving waters in the HA. Activities presented by the Copermittees in the JURMP Annual Reports, namely street sweeping and MS4 cleanings, result in a quantifiable pollutant load reduction to the MS4 and thereby to the receiving waters. Looking at these two municipal activities alone, approximately 750.8 tons of pollutants were removed in the HA.

The planned monitoring activity, CHU-WQA22, will provide a baseline assessment of water quality in the receiving water and at selected tributaries. The quarterly, and thus seasonal, monitoring will then be assessed and modified to allocate resources to identifying sources of HPWQPs. The monitoring began during FY 2010 and continued into FY 2011, although the fall sampling event was postponed due to laboratory contracting issues; therefore, sampling may continue into the next fiscal year and the program will be assessed when a full year of data is available.

The following activities also target the HPWQPs and the sources likely to be contributing to them:

- The County's Residential Rain Barrel activity, CHU-WQA17, is focused on addressing residential sources, a significant source of bacteria. Two events were held during the

reporting period where rain barrels were sold to citizens in the WMA. A total of 185 residents participated in these events and a total of 240 rain barrels were sold. Participating residents came from a variety of watersheds throughout the County. While no event was hosted in the Carlsbad Watershed, eight (8) participants from the watershed purchased rain barrels and signed the rain barrel maintenance agreement.

- The Residential Composting Workshop education activity, CHU-WQEA9, is a free workshop providing an overview of composting, hands-on demonstrations on how to compost, proper application of compost, and the benefits of compost to soil and water quality. The use of chemical fertilizers has been identified as a potential source of nutrients and eutrophication in local water bodies. Using compost as a natural fertilizer will reduce the amount of chemical fertilizer that residents use in their landscapes, thereby reducing a potential source of nutrients. Erosion and sedimentation can also be reduced through the proper application of compost.
- The City of Oceanside's Residential Smart Landscape Evaluation Program education activity, CHU-WQEA13, focuses on reducing irrigation runoff from residential properties. The landscape irrigation evaluation program for single-family and multi-family residences provides technicians to visit and evaluate residential properties in order to make site-specific water-saving recommendations. Site-specific education will help residents and multi-family property managers to reduce and eliminate irrigation runoff from their property.

Table 5-3 Summary of Implemented Activities for FY 2011 – 904.2 Buena Vista Hydrologic Area

Activity:	Type:	Priority Problems Addressed:	Level Outcomes:	Pollutant Load Reduction, Source Abatement or Other Benefit Derived:
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3, and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2011 included agriculture, animal facilities, restaurants, and nurseries. Of the total 439 bacteria sources inventoried, 92% are restaurants. Approximately 69% of the restaurants were inspected and 21% of the nurseries were inspected. Overall 66% of the likely bacteria sources inventoried were inspected.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria	Levels 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria sources. During FY 2011, 795 tons of material was removed from streets via street sweeping and 1,667 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, brow ditches, and open channels.
Residential Rain Barrel Subsidies and Distribution	Water Quality	Bacteria and Nutrients	Levels 1 and 4	Residential rain barrel subsidy promoting outdoor water conservation and runoff reduction through public outreach.
Focused Equestrian Outreach	Watershed Education	Bacteria and Nutrients	Levels 1, 2, and 3	Controlling animal waste and educating the public on BMPs will result in the reduction of pollutant loads, particularly bacteria and nutrients.
Residential Smart Landscape Evaluation Program	Watershed Education	Bacteria and Nutrients	Levels 1 and 2	Site-specific education will help residents and multi-family property managers to reduce and eliminate irrigation runoff from their property.

Buena Vista HA Discussion

The major land use in the HA is residential, comprising approximately 50 percent of the land use in Buena Vista. Transportation, open space, industrial/commercial, and municipal land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria, as this was identified as the only HPWQP in the HA.

Residential sources of bacteria include activities such as over-irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate bacteria. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs. While JURMP activities do address residential sources to some extent, many are reactive in nature (i.e. complaint response) and limited in scope (TCBMP inspections).

Examples of JURMP Activities addressing these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

Through the implementation of JURMP Activities addressing the sources identified above, the WURMP Copermittees have effectively reduced the amount of pollutants from entering the receiving waters in the HA. Activities presented by the Copermittees in the JURMP Annual Reports, namely street sweeping and MS4 cleanings, result in a quantifiable pollutant load reduction to the MS4 and thereby to the receiving waters. Looking at these two municipal activities alone, approximately 2,462.3 tons of pollutants were removed in the HA.

The following activities also target the HPWQPs and the sources likely to be contributing to them:

- The County's Residential Rain Barrel activity, CHU-WQA17, is focused on addressing residential sources, a significant source of bacteria. Two events were held during the reporting period where rain barrels were sold to citizens in the WMA. A total of 185 residents participated in these events and a total of 240 rain barrels were sold. Participating residents came from a variety of watersheds throughout the County. While no event was hosted in the Carlsbad Watershed, eight (8) participants from the watershed purchased rain barrels and signed the rain barrel maintenance agreement.
- The County's Focused Equestrian Outreach education activity, CHU-WQEA11, provides focused outreach that leads to education, BMP implementation, and load-reducing effectiveness. Workshops in FY 2011 targeted the equestrian community, including manure management, composting, and erosion control. Controlling animal waste and educating the public on BMPs will potentially result in the reduction of pollutant loads, particularly bacteria and nutrients.
- The City of Oceanside's Residential Smart Landscape Evaluation Program education activity, CHU-WQEA13, focuses on reducing irrigation runoff from residential properties. The landscape irrigation evaluation program for single-family and multi-family residences provides technicians to visit and evaluate residential properties in order to make site-specific water-saving recommendations. Site-specific education will help residents and multi-family property managers to reduce and eliminate irrigation runoff from their property.

Table 5-4 Summary of Implemented Activities for FY 2011 – 904.3 Agua Hedionda Hydrologic Area

Activity:	Type:	Priority Problems Addressed:	Level Outcomes:	Pollutant Load Reduction, Source Abatement or Other Benefit Derived:
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3, and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2011 included agriculture, animal facilities, restaurants, and nurseries. Of the total 260 bacteria sources inventoried, 70% are restaurants. Approximately 59% of the restaurants were inspected, and overall 48% of the likely bacteria sources inventoried were inspected.
JURMP Industrial/Commercial Inspections	Water Quality	Nutrients	Levels 1, 3, and 4	Sources categorized as likely to produce nutrients inventoried under the JURMP program during FY 2011 included agriculture, animal facilities, golf courses, health services, and nurseries. Of the total 88 nutrient sources inventoried, 75% are nurseries. 18% of the nurseries in the HA were inspected. Overall, 31% of the likely nutrient sources inventoried were inspected.
JURMP Industrial/Commercial and Construction Site Inspections	Water Quality	Sediments	Levels 1, 3, and 4	Sources categorized as likely to produce sediment inventoried under the JURMP program during FY 2011 included agriculture, animal facilities, contractors, general retail, health services, manufacturing, nurseries, stone and aggregate facilities, storage and warehousing facilities, construction sites, and municipal facilities. The primary focus of likely sources of sediment is construction sites. During FY 2011, there were approximately 111 active construction sites in the HA that were inspected a total of 1,039 times. High priority construction sites were inspected an average of 19 times during the fiscal year. Of the total 374 commercial/industrial sediment sources inventoried, 24% are manufacturing facilities, 16% are contractors, and 14% are general retail. Only 18% of the manufacturing facilities and 25% of the contractors were inspected, however 83% of the general retail facilities were inspected. Overall, 43% of the likely sediment sources that were not related to construction sites were inspected.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria, Nutrients, and Sediments	Levels 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria sources. During FY 2011, 532 tons of material was removed from streets via street sweeping and 995 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, brow ditches, and open channels.
Nitrate Source Identification and Abatement: Buena Creek	Water Quality	Nutrients	Levels 1, 2, 3, and 4	Inspections resulted in education and BMP implementation
Water Quality Treatment Facility @ Palomar Airport	Water Quality	Nutrients and Sediments	Level 1	Regular water quality monitoring and comparison of influent and effluent pollutant loading at McClellan-Palomar Airport water quality treatment facility. Nutrient and sediment removal of pollutants associated with airport operations.
Agua Hedionda Creek Restoration – SR-02+	Water Quality	Sediments	Levels 1, 4, and 6	Reduction of Creek bed and bank erosion to achieve a stable balance representative of the appropriate sediment transport; reduced sediment loading.
Residential Rain Barrel Subsidies and Distribution	Water Quality	Bacteria and Nutrients	Levels 1 and 4	Residential rain barrel subsidy promoting outdoor water conservation and runoff reduction through public outreach.
Focused Equestrian Outreach	Watershed Education	Bacteria and Nutrients	Levels 1, 2, and 3	Controlling animal waste and educating the public on BMPs will result in the reduction of pollutant loads, particularly bacteria and nutrients.
Residential Smart Landscape Evaluation Program	Watershed Education	Bacteria and Nutrients	Levels 1 and 2	Site-specific education will help residents and multi-family property managers to reduce and eliminate irrigation runoff from their property.

Agua Hedionda HA Discussion

The major land uses in the HA are residential, open space, and industrial/commercial comprising over 80 percent of the land use in Agua Hedionda. Transportation, municipal, and construction land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria, sediment, and nutrients, as these were identified as the HPWQPs in the HA.

Residential sources of bacteria, sediment, and nutrients include activities such as over-irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate the pollutants identified as high priority. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs. While JURMP activities do address residential sources to some extent, many are reactive in nature (i.e. complaint response) and limited in scope (TCBMP inspections).

Industrial/commercial sources of bacteria, sediment, and nutrients include activities such as grounds/landscape maintenance, surfaces and washing, over irrigation, sewer/septic problems, and materials management issues among others. Through a combination of activities, including the Nitrate Source Identification and Abatement activity, JURMP commercial/industrial inspections programs, and complaint response programs, the likely sources of the HPWQPs are being addressed.

Other less predominant sources of bacteria, sediment, and nutrients in the HA include transportation, municipal, and construction land uses. The WURMP activities implemented in the HA did not address these sources directly. However, with the JURMP Activities, each of these land uses/sources are specifically addressed. Examples of JURMP Activities addressing these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

Through the implementation of JURMP Activities identified above, the WURMP Copermittees have effectively reduced the amount of pollutants from entering the receiving waters in the HA. Activities presented by the Copermittees in the JURMP Annual Reports, namely street sweeping and MS4 cleanings, result in a quantifiable pollutant load reduction to the MS4 and thereby to the receiving waters. Looking at these two municipal activities alone, approximately 1,527.2 tons of pollutants were removed in the HA.

The following activities also target the HPWQPs and the sources likely to be contributing to them:

- The County’s Stormwater Quality Master Plan for Special Drainage Fee Areas will be focused at addressing portions of the County’s jurisdiction within the WMA by retrofitting their drainage system with BMPs. This will address multiple sources as well as multiple water quality problems. The SWQMP for Special Drainage Areas 9 and 10 are currently in draft form and undergoing review by County personnel.
- Monitoring at the McClellan-Palomar Airport Water Quality Treatment Facility compares influent and effluent pollutant loading from runoff due to airport operations.

- The City of Vista’s Agua Hedionda Creek Restoration Project is to address impacts from hydromodification that are evident within Agua Hedionda Creek, thereby addressing a source of sedimentation (bed and bank erosion).
- The County’s Residential Rain Barrel activity, CHU-WQA17, is focused on addressing residential sources, a significant source of bacteria. Two events were held during the reporting period where rain barrels were sold to citizens in the WMA. A total of 185 residents participated in these events and a total of 240 rain barrels were sold. Participating residents came from a variety of watersheds throughout the County. While no event was hosted in the Carlsbad Watershed, eight (8) participants from the watershed purchased rain barrels and signed the rain barrel maintenance agreement.
- The County’s Focused Equestrian Outreach education activity, CHU-WQEA11, provides focused outreach that leads to education, BMP implementation, and load-reducing effectiveness. Workshops in FY 2011 targeted the equestrian community, including manure management, composting, and erosion control. Controlling animal waste and educating the public on BMPs will potentially result in the reduction of pollutant loads, particularly bacteria and nutrients.
- The City of Oceanside’s Residential Smart Landscape Evaluation Program education activity, CHU-WQEA13, focuses on reducing irrigation runoff from residential properties. The landscape irrigation evaluation program for single-family and multi-family residences provides technicians to visit and evaluate residential properties in order to make site-specific water-saving recommendations. Site-specific education will help residents and multi-family property managers to reduce and eliminate irrigation runoff from their property.

Table 5-5 Summary of Implemented Activities for FY 2011 – 904.5 San Marcos Hydrologic Area

Activity:	Type:	Priority Problems Addressed:	Level Outcomes:	Pollutant Load Reduction, Source Abatement or Other Benefit Derived:
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3, and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2011 included animal facilities, restaurants, and nurseries. Of the total 678 bacteria sources inventoried, 78% are restaurants. Approximately 31% of the restaurants were inspected, and overall 27% of the likely bacteria sources inventoried were inspected.
JURMP Industrial/Commercial Inspections	Water Quality	Nutrients	Levels 1, 3, and 4	Sources categorized as likely to produce nutrients inventoried under the JURMP program during FY 2011 included animal facilities, cemeteries, golf courses, health services, and nurseries. Of the total 163 nutrient sources inventoried, 64% are nurseries. 11% of the nurseries in the HA were inspected, while 67% of the golf facility sources were inspected. Overall, 14% of the likely nutrient sources inventoried were inspected.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria and Nutrients	Levels 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria and nutrient sources. During FY 2011, 1,806 tons of material was removed from streets via street sweeping and 439 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, brow ditches, and open channels.
Upper San Marcos Creek Nutrient Management Plan	Water Quality	Nutrients	Levels 1, 2, 3 and 4	Through education and outreach, inspections and BMP implementation, pollutant loading is expected to decrease
Residential Rain Barrel Subsidies and Distribution	Water Quality	Bacteria and Nutrients	Levels 1 and 4	Residential rain barrel subsidy promoting outdoor water conservation and runoff reduction through public outreach.
Upper San Marcos Creek Nutrient Management Plan – Parks Component	Water Quality	Nutrients	Levels 1 and 4	Inspections were conducted at all park facilities in the USMC tributary area. Additionally, the City of San Marcos implemented true source control by continuing to use “Nature Safe” an organic fertilizer product.
Upper San Marcos Creek Nutrient Management Plan – Golf Courses Component	Water Quality	Nutrients	Levels 1 and 2	Inspections occurred at all 4 golf courses in the watershed. Additionally, the four golf courses were notified of existing requirements and appropriate BMPs for implementation.
Upper San Marcos Creek Nutrient Management Plan – Agriculture Component	Water Quality	Nutrients	Level 1	All elements of the core residential activities program were completed. Educational outreach efforts were conducted for professional grove management companies; attendees were provided BMP field guides for water quality and spill kits.
Upper San Marcos Creek Nutrient Management Plan – Monitoring Component	Water Quality	Nutrients	Level 1	Additional monitoring and new TWAS installation to better characterize the USMC tributary area. Development of a QAPP, additional DWM activities, residential monitoring and inspections of MS4 conveyances leading into Lake San Marcos.
San Diego County <i>Enterococcus</i> Regrowth Study	Water Quality	Bacteria	Level 1	Monitoring in Cottonwood Creek to determine possible sources of bacterial regrowth downstream of UV treatment facility at Moonlight Beach. Results compared to study in La Jolla.
Upper San Marcos Creek Nutrient Management Plan – Residential Component	Watershed Education	Nutrients	Levels 2 and 3	Through various means, education messages were presented to the residents in the USMC tributary area. This includes the decision to invest additional resources to involve Social Based Marketing professionals in order to enhance the effectiveness and applicability of the water quality management plan.
Ocean Friendly Gardens Workshop Series	Watershed Education	Bacteria and Nutrients	Levels 2 and 3	Expected change in knowledge and BMP implementation.
Focused Equestrian Outreach	Watershed Education	Bacteria and Nutrients	Levels 1, 2, and 3	Controlling animal waste and educating the public on BMPs will result in the reduction of pollutant loads, particularly bacteria and nutrients.
Cottonwood Creek Watershed Interpretive Signage	Watershed Education	Bacteria	Level 1	Activity will add seven interpretive signs along Cottonwood Creek just east of Moonlight Beach, with information on stormwater awareness and pollution prevention.

San Marcos HA Discussion

The major land use in the HA is residential. Transportation, open space, industrial/commercial, and municipal land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria and nutrients, as these pollutants are identified as the two HPWQPs in the HA.

JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate nutrients. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs. While JURMP activities do address residential sources to some extent, many are reactive in nature (i.e. complaint response) and limited in scope (TCBMP inspections).

Examples of JURMP Activities addressing nutrient sources in the HA include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

Through the implementation of JURMP Activities identified above, the WURMP Copermittees have effectively reduced the amount of pollutants from entering the receiving waters in the HA. Activities presented by the Copermittees in the JURMP Annual Reports, namely street sweeping and MS4 cleanings, result in a quantifiable pollutant load reduction to the MS4 and thereby to the receiving waters. Looking at these two municipal activities alone, approximately 2,244.2 tons of pollutants were removed in the HA.

Within the San Marcos HA, the Upper San Marcos Creek (USMC) tributary area has been targeted for significant activities by the USMC Copermittees. The activities related to the USMC fall under the umbrella of the USMC Nutrient Management Plan. Through the implementation of this Plan, the commercial, residential, agricultural and municipal sources are being addressed. The activities are focused on characterizing and abating the sources of nutrients. These activities were initiated in FY 2009 and are currently ongoing.

The following activities also target the HPWQPs and the sources likely to be contributing to them:

- The County's Stormwater Quality Master Plan for Special Drainage Fee Areas will be focused at addressing portions of the County's jurisdiction within the WMA by retrofitting their drainage system with BMPs. This will address multiple sources as well as multiple water quality problems. The SWQMP for Special Drainage Areas 9 and 10 are currently in draft form and undergoing review by County personnel.
- The County's Residential Rain Barrel activity, CHU-WQA17, is focused on addressing residential sources, a significant source of bacteria. Two events were held during the reporting period where rain barrels were sold to citizens in the WMA. A total of 185 residents participated in these events and a total of 240 rain barrels were sold. Participating residents came from a variety of watersheds throughout the County. While no event was hosted in the Carlsbad Watershed, eight (8) participants from the watershed purchased rain barrels and signed the rain barrel maintenance agreement.
- The San Diego County *Enterococcus* Regrowth Study activity, CHU-WQA23, focused on determining potential source of bacterial indicator regrowth in MS4 conveyances. The goals of the study included: 1) to determine if biofilms and algae that form on the surfaces of storm drains support the growth of *Enterococci*; 2) to determine if

- Enterococci* growing on storm drain surfaces are a source of bacteria to sand and beach water; and 3) to determine if *Enterococci* growing on storm drain surfaces may be differentiated from those of fecal origin.
- The City of Encinitas, in collaboration with Olivenhain Municipal Water District and the San Dieguito Water District, hosted a hands-on workshop series presented by the Surfrider Foundation Ocean Friendly Gardens Program, education activity CHU-WQEA10. The program strives to educate the public about the environmental impacts caused by runoff from residential homes and landscapes and to provide homeowners with landscaping alternatives that can lead to reduced water usage and improved downstream water quality.
 - The County's Focused Equestrian Outreach education activity, CHU-WQEA11, provides focused outreach that leads to education, BMP implementation, and load-reducing effectiveness. Workshops in FY 2011 targeted the equestrian community, including manure management, composting, and erosion control. Controlling animal waste and educating the public on BMPs will potentially result in the reduction of pollutant loads, particularly bacteria and nutrients.
 - The City of Encinitas's Cottonwood Creek Watershed Interpretive Signage education activity, CHU-WQEA12, will add seven interpretive signs along Cottonwood Creek just east of Moonlight Beach. The signs will educate the public on the following themes: 1) Cottonwood Creek Watershed Overview; 2) Moonlight Beach Pump Station; 3) UV Treatment Facility; 4) Native Plant Species; 5) Native Animal Species; 6) Stormwater Awareness; and, 7) Stormwater Pollution Prevention Tips. The signs are planned to be installed in FY 2012.

Table 5-6 Summary of Implemented Activities for FY 2011 – 904.6 Escondido Creek Hydrologic Area

Activity:	Type:	Priority Problems Addressed:	Level Outcomes:	Pollutant Load Reduction, Source Abatement or Other Benefit Derived:
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3 and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2011 included agriculture, animal facilities, restaurants, and nurseries. Of the total 493 bacteria sources inventoried, 88% are restaurants. Approximately 65% of the restaurants were inspected, and overall 60% of the likely bacteria sources inventoried were inspected.
JURMP Industrial/Commercial Inspections	Water Quality	Nutrients	Levels 1, 3 and 4	Sources categorized as likely to produce nutrients inventoried under the JURMP program during FY 2011 included agriculture, animal facilities, golf courses, health services, and nurseries. Of the total 75 nutrient sources inventoried, 43% are nurseries, 34% of which were inspected. Overall, approximately 37% of the likely nutrient sources inventoried were inspected.
JURMP Industrial/Commercial and Construction Site Inspections	Water Quality	Sediments	Levels 1, 3 and 4	Sources categorized as likely to produce sediment inventoried under the JURMP program during FY 2011 included agriculture, animal facilities, contractors, general retail, golf courses, health service facilities, manufacturing, mining facilities, nurseries, stone and aggregate facilities, storage and warehousing facilities, construction sites, and municipal facilities. The primary focus of likely sources of sediment is construction sites. During FY 2011, there were approximately 260 active construction sites in the HA that were inspected a total of 2,341 times. The high priority sites were inspected an average of 18 times during the fiscal year. Of the total 746 commercial/industrial sediment sources inventoried, 56% are contractors, 13% are manufacturing facilities, and 11% are storage and warehousing facilities. Over 56% of the contractors were inspected, approximately 60% of the manufacturing facilities were inspected, and approximately 57% of the storage and warehousing facilities were inspected. Overall, 55% of the likely sediment sources that were not related to construction sites were inspected.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria and Nutrients	Levels 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria sources. During FY 2011, 1,056 tons of material was removed from streets via street sweeping and 662 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, brow ditches, and open channels.
Pet Waste Bag Dispenser Program in County Parks	Water Quality	Bacteria and Nutrients	Levels 1, 2, 3 and 4	Direct reduction in loading due to implementation of BMP.
Land Acquisitions	Water Quality	Bacteria, Sediment and Nutrients	Level 4	Loading associated with potential development is eliminated. 192.00 acres were acquired in the Escondido Creek HA during FY 2011.
Residential Rain Barrel Subsidies and Distribution	Water Quality	Bacteria and Nutrients	Levels 1 and 4	Residential rain barrel subsidy promoting outdoor water conservation and runoff reduction through public outreach.
LID Features in San Elijo Nature Center	Watershed Education	Bacteria, Sediment and Nutrients	Levels 1, 2 and 3	Expected change in knowledge and BMP implementation.
Focused Equestrian Outreach	Watershed Education	Bacteria and Nutrients	Levels 1, 2, and 3	Controlling animal waste and educating the public on BMPs will result in the reduction of pollutant loads, particularly bacteria and nutrients.

Escondido Creek HA Discussion

The major land uses in the HA are open space and residential, comprising over 75 percent of the land use in Escondido Creek. Transportation, municipal, and construction land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria, sediment, and nutrients, as these were identified as the HPWQPs in the HA.

Residential sources of bacteria, sediment, and nutrients include activities such as over-irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. Activities such as the Pet Waste Dispenser Program, Land Acquisitions, and the LID Features in the San Elijo Nature Center focused on the appropriate water quality problems in the HA and indirectly focused on residential sources/causes of the problems.

JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate the pollutants identified as high priority. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs. While JURMP activities do address residential sources to some extent, many are reactive in nature (i.e. complaint response) and limited in scope (TCBMP inspections). Because of the relative potential for contributions from residential areas, based on the land use percentages, future WURMP activities focusing on residential sources of pollutants may be appropriate in this HA.

Other less predominant sources of bacteria, sediment, and nutrients in the HA include transportation, municipal, and construction land uses. The WURMP activities implemented in the HA did not address these sources directly. However, with the JURMP Activities, each of these land uses/sources are specifically addressed. Examples of JURMP Activities addressing these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

Through the implementation of JURMP Activities identified above, the WURMP Copermittees have effectively reduced the amount of pollutants from entering the receiving waters in the HA. Activities presented by the Copermittees in the JURMP Annual Reports, namely street sweeping and MS4 cleanings, result in a quantifiable pollutant load reduction to the MS4 and thereby to the receiving waters. Looking at these two municipal activities alone, approximately 1,718.2 tons of pollutants were removed in the HA.

The following activities also target the HPWQPs and the sources likely to be contributing to them:

- The County’s Stormwater Quality Master Plan for Special Drainage Fee Areas will be focused at addressing portions of the County’s jurisdiction within the WMA by retrofitting their drainage system with BMPs. This will address multiple sources as well as multiple water quality problems. The SWQMP for Special Drainage Areas 9 and 10 are currently in draft form and undergoing review by County personnel.
- The County’s Residential Rain Barrel activity, CHU-WQA17, is focused on addressing residential sources, a significant source of bacteria. Two events were held during the reporting period where rain barrels were sold to citizens in the WMA. A total of 185 residents participated in these events and a total of 240 rain barrels were sold. Participating residents came from a variety of watersheds throughout the County.

- While no event was hosted in the Carlsbad Watershed, eight (8) participants from the watershed purchased rain barrels and signed the rain barrel maintenance agreement.
- The County's LID Features in San Elijo Nature Center education activity, CHU-WQEA5, is expected to increase knowledge and BMP implementation. In addition to the educational displays featured at the San Elijo Nature Center, the facility also sponsors public participation activities in cooperation with the San Elijo Lagoon Conservancy (SELCO). These programs which included educational field presentations, water quality testing activities, and clean up events had an estimated total attendance of 800 participants in FY 2011.
 - The County's Focused Equestrian Outreach education activity, CHU-WQEA11, provides focused outreach that leads to education, BMP implementation, and load-reducing effectiveness. Workshops in FY 2011 targeted the equestrian community, including manure management, composting, and erosion control. Controlling animal waste and educating the public on BMPs will potentially result in the reduction of pollutant loads, particularly bacteria and nutrients.

5.4 ASSESSMENT OF OVERALL WURMP EFFECTIVENESS

Based on the individual HA assessments provided above, it appears that the activities occurring in the Carlsbad Watershed are addressing the HPWQPs identified in the watershed. The assessments this year provided an integrated look at WURMP and JURMP activities to show the level of effort occurring in each HA with respect to identified problems and sources. Generally, the activities are focused on sources that are likely contributing to the HPWQPs within the WMA.

6 CONCLUSIONS AND WURMP IMPROVEMENTS

6.1 OVERVIEW

The Carlsbad Watershed Management Area (WMA) is unique because it consists of six (6) individual hydrologic areas (HAs) or watersheds. To effectively address the WMA's water quality issues (bacteria, sediment, and nutrients), the Copermittees identified and then evaluated the high-priority water quality problems for likely sources at the individual HA level. As a result of examining each HA in the WMA, the Copermittees identified some general conclusions. It appears that the water quality activities occurring in the Carlsbad Watershed are effectively addressing the high-priority water quality problems identified in the watershed.

The following is a summary of some general conclusions and potential improvements that will be considered in the Carlsbad WURMP.

6.1.1 LOMA ALTA

The major land use in this HA includes residential and open space, totaling almost 60 percent of its overall land use. Based on monitoring data, the high-priority water quality problem are bacteria and nutrients. Potential residential sources of bacteria and nutrients include activities such as over-irrigation, sanitary sewer overflows, improper landscape maintenance, improper disposal of pet waste, and improper use of fertilizers, herbicides and pesticides. JURMP activities addressing residential sources include complaint response, dry weather urban runoff monitoring and source identification, and inspections of treatment control BMPs, as some in the hydrologic area are designed to mitigate bacteria. Additionally, there are significant outreach activities performed which are focused on the residential community through the Copermittees' jurisdictional program.

6.1.2 BUENA VISTA

The major land use in this HA is residential, comprising approximately 50 percent of the total land use area in Buena Vista. Based on monitoring data, the high-priority water quality problem is bacteria. Potential residential sources of bacteria include activities such as over-irrigation, sanitary sewer overflows, septic system overflows, improper landscape maintenance, various improper washing activities and improper disposal of pet waste. JURMP activities addressing residential sources include complaint response and inspections of treatment control BMPs, as some are designed to mitigate bacteria.

6.1.3 AGUA HEDIONDA

The major land uses in the HA are residential, open space, and industrial/commercial, which comprise over 85 percent of the land use in Agua Hedionda. Transportation, municipal, and construction land uses are all present as well and produce the high-priority pollutants identified for the area: bacteria, sediment, and nutrients.

Potential residential, industrial/commercial, and other less predominant sources of bacteria, sediment, and nutrients include an array of activities, such as over-irrigation, sanitary sewer overflows, septic system overflows, improper landscape maintenance, improper use of fertilizers, herbicides and pesticides, various improper washing activities and improper disposal of pet waste. With the implementation of LID and SUSMP-related BMPs, as well as some other watershed water quality activities, it is expected that pollutant loading will be reduced from residential as well as other areas. JURMP activities addressing residential and

other sources, such as outreach, industrial/commercial inspections, complaint response, and inspections of treatment control BMPs, also reduce pollutant loading in the HA.

6.1.4 SAN MARCOS

The major land uses in the hydrologic area are residential and open space, which total over 65 percent of the land use area in San Marcos HA. Transportation, industrial/commercial, and municipal land uses are all present as well and may also contribute to pollutant loading. Based on water quality monitoring data, bacteria and nutrients are identified as the high-priority water quality problems in the HA. Potential residential sources of bacteria and nutrients include activities such as over-irrigation, sanitary sewer overflows and septic system failures, improper landscape maintenance, and improper disposal of pet waste. With the implementation of the Upper San Marcos Creek Nutrient Management Plan Project, nutrient loads are expected to be reduced in the HA over time. Depending upon the results and the effectiveness of the Nutrient Management Plan, the other WMA Copermittees may implement elements of the Plan.

6.1.5 ESCONDIDO CREEK

The major land uses in the HA are open space and residential, which comprise over 75 percent of the total land use in Escondido Creek. Based on water quality monitoring, bacteria, sediment, and nutrients are identified as the high-priority water quality problems in the HA. Potential residential sources of bacteria, sediment, and nutrients include activities such as over-irrigation, sanitary sewer overflows and septic system failures, improper landscape maintenance, various improper washing activities, and improper disposal of pet waste.

6.2 WURMP IMPROVEMENTS

In light of emerging TMDLs, the potential for regional permitting, the Copermittees' visioning process, and the unfunded mandate test claim status, the Copermittees are committed to focusing on increasing effectiveness and decreasing duplication of programs.

Regardless of the outcome of these and other issues, the Copermittees remain committed to working closely with the Regional Board in the next year to ensure a reasonable, effective, and achievable Municipal Permit is prepared for reissuance. The Permit reissuance is likely to have significant changes to the WURMPs. The Carlsbad WURMP Copermittees will continue to assess their implementation, reporting and program assessment to look for improvement opportunities.

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