

**Watershed Urban Runoff Management Program
Fiscal Year 2009-10 Annual Report**

Santa Margarita River Watershed

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

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Prepared by the County of San Diego

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ATTACHMENT A: Watershed Activity Summary Sheets

ATTACHMENT B: Updated Five-Year Strategic Plan for the Santa Margarita River
WURMP

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EXECUTIVE SUMMARY

This annual report describes implementation of the Santa Margarita River Watershed Urban Runoff Management Program (WURMP) during FY 2009-10. Although much of the Santa Margarita River Watershed Management Area (WMA) extends into Riverside County, only the portion within County of San Diego boundaries is subject to the Municipal Stormwater Permit's WURMP requirements.

Section 2.0 presents an updated water quality assessment for the Santa Margarita River WMA. The assessment is based on results from a regional receiving waters and urban runoff monitoring program conducted by the San Diego County Municipal Stormwater Copermittees in compliance with Municipal Permit requirements. It is supplemented by results from other monitoring programs, including jurisdictional dry weather monitoring and special studies. Five priority watershed water quality problems have been identified, two of which are considered high priorities for the purposes of WURMP implementation: nutrients and sediment.

Section 3.0 and Attachment A describe 15 watershed activities that were in various phases of implementation during FY 2009-10. Several addressed nutrient impairments in the Rainbow Creek Watershed, where TMDLs for total nitrogen and total phosphorous were adopted in 2006. The County also performed a number of special monitoring studies and BMP demonstration projects elsewhere in the watershed. Focused education and outreach programs targeted a wide spectrum of potential pollutant sources in the watershed. Attachment C describes watershed activities that were implemented in previous years and are now completed. The name of each watershed activity in active implementation during FY 2009-10 is listed below:

- SMR-005 Rainbowcreek.org Web Site
- SMR-006 Focused Onsite Wastewater System Outreach
- SMR-007 Focused Grove and Nursery Outreach
- SMR-008 Focused Horse and Small Animal Operator Outreach
- SMR-009 Focused General Residential Outreach
- SMR-010 Rainbow Valley Groundwater Monitoring Well Network
- SMR-011 Rainbow Creek Water Quality Monitoring Program
- SMR-015 Santa Margarita Lagoon Investigative Order Monitoring Program
- SMR-016 Water Quality Monitoring at Additional Mass Loading Stations
- SMR-017 Land Acquisitions
- SMR-018 Cleanup Event Sponsorships
- SMR-021 Pet Waste Bag Dispenser Program in County Parks
- SMR-023 Parcel-Based Characterization of Nutrient Sources in the Rainbow Creek Watershed
- SMR-024 Fallbrook Library Green Roof
- SMR-025 Residential Rain Barrel Subsidy and Distribution Project

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SIGNED WURMP ANNUAL REPORT CERTIFICATION

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1 INTRODUCTION

The National Pollutant Discharge Elimination System (NPDES) Municipal Storm Water Permit for San Diego (Order No. R9-2007-0001, NPDES No. CAS 0108758, hereafter referred to as “Municipal Permit”) requires the Copermittees within the Santa Margarita River Watershed Management Area (WMA) to collaboratively develop and implement a Watershed Urban Runoff Management Program (WURMP) (Regional Water Quality Control Board [RWQCB], 2007). Although much of the Santa Margarita River WMA extends into Riverside County, only the portion within County of San Diego boundaries is subject to the Municipal Permit’s WURMP requirements. A Santa Margarita River WURMP was first developed in 2003. In accordance with the requirements of Order No. R9-2007-0001, an update was submitted to the RWQCB in March 2008 and is referenced extensively throughout this document.

This annual report describes implementation of the Santa Margarita River WURMP during FY 2009-10. It is important to note that the WURMP complements and augments implementation of the County of San Diego’s Jurisdictional Urban Runoff Management Program (JURMP) as well as the Regional Urban Runoff Management Program (RURMP) implemented jointly by all 21 regional Copermittees. For a complete accounting of all urban runoff management activities implemented in the Santa Margarita River WMA during FY 2009-10, readers are advised to consult WURMP, JURMP, and RURMP Annual Reports.

1.1 Copermittee Collaboration

The Municipal Permit requires Copermittees sharing a watershed to collaborate on WURMP development and implementation through frequent, regularly scheduled meetings. Since the County is the sole Copermittee in the Santa Margarita River WMA, this Permit provision does not apply.

1.2 Watershed Map Updates

During FY 2009-10, no updates were made to the map depicting existing land uses within the Santa Margarita WMA. The most recent version of the WMA map was submitted with the FY 2007-08 WURMP Annual Report.

2 WATER QUALITY AND POLLUTANT SOURCE ASSESSMENT

This section assesses surface water quality and potential pollutant sources within the Santa Margarita River WMA. The County of San Diego participates in a regional monitoring program, which rotates between the northern and southern watersheds of San Diego County every other year. During FY 2009-10, regional monitoring efforts were focused in the southern watersheds. Therefore, the current water quality assessment for the Santa Margarita WMA does not include FY 2009-10 data from several major monitoring programs, including the Temporary Watershed Assessment Stations (TWAS) and Mass Loading Stations (MLS). Instead, this assessment is largely based on historical MLS and TWAS data as well as data collected from jurisdictional monitoring programs, Stormwater Monitoring Coalition (SMC) Program ambient monitoring, and special watershed studies. A detailed review of all monitoring activities taking place within the Santa Margarita WMA can be found in the Copermittees' *2009-2010 Receiving Water and Urban Runoff Monitoring Annual Report* (Weston Report). The pollutant source assessment in Section 2.2 is derived from an analysis of land use coverage, jurisdictional pollutant source inventories, as well as past and present source characterization efforts.

2.1 Water Quality Assessment

2.1.1 2009-10 Water Quality Programs and Data

Table 2-1 identifies the active water quality monitoring programs in the Santa Margarita River WMA and summarizes monitoring activity during FY 2009-10. Additional detail on each monitoring program can be found in the 2009-10 Weston Report, individual JURMP Annual Reports, and/or watershed activity sheets in Attachment A to this report.

Table 2-1 Water Quality Monitoring Activities in the Santa Margarita River WMA (2009-10)

Program Data Set	Data Assessed	Number of Sites Assessed
Receiving Water Monitoring		16
Ambient Monitoring - SMC Regional Monitoring Participation	Water chemistry and toxicity	1-SMC Site*
Rapid Stream Bioassessment - SMC Regional Monitoring Participation	Benthic macroinvertebrates, periphyton, and physical habitat	1-SMC Site*
Wet Weather Monitoring	Water chemistry, bacteria, toxicity, and trash	None (Off Rotation)
Post-Storm Sediment Pyrethroid Monitoring	Grain size, synthetic pyrethroid pesticides, and Total Organic Carbon (TOC)	None (Off Rotation)
Rainbow Creek Water Quality Monitoring Program (SMR-011)	Field parameters, nitrate, nitrite, total kjeldahl nitrogen, ammonia, orthophosphate, total phosphorous, TDS	13 sites
Water Quality Monitoring at Additional MLS Stations (SMR-016)	Field parameters, ammonia-N, total iron, total manganese, nitrate-N, nitrite-N, ortho-phosphate, total Kjeldahl nitrogen, total phosphate-P, TDS, sulfates	2 sites
Urban Runoff Monitoring		35
Jurisdictional Dry Weather	Field, analytical chemistry, and trash	4

Program Data Set	Data Assessed	Number of Sites Assessed
Monitoring		
MS4 Outfall Random Dry Weather Monitoring	Chemistry and bacteria	13 randomly selected outfalls visited: 7 sites dry, and 6 flowing sites sampled
MS4 Outfall Random Wet Weather Monitoring	Chemistry and bacteria	6 randomly selected outfalls
MS4 Outfall Targeted Dry Monitoring	Chemistry, metals, and bacteria	10
MS4 Outfall Targeted Wet Monitoring	Chemistry, metals, pesticides, and bacteria	None
Regional Source Identification Monitoring	General chemistry, metals, bacteria, and pesticides	2 sites (from residential only areas of regionally applicable land uses)
* The SMC Monitoring Program uses a random stratified program design and is one sample from a 425 sample point program to be collected over five years (http://socalsmc.org/ProjectThree.aspx).		

2.1.2 2009-10 Water Quality Monitoring Results

Table 2-2 summarizes annual monitoring results and identifies relationships between receiving waters and municipal separate storm sewer system (MS4) outfall results during dry and wet weather conditions. The constituents listed in Table 2-2 represent medium and priority constituents based on the *Methodology for Annual and Long-Term Data Assessments for San Diego County Watershed Management Areas*, Final Draft-Version 1 (SDCRC, 2010). Results in Table 2-2 do not take into account data from special studies, which are described where available in the watershed activity sheets in Attachment A. Table 2-2 also identifies the core management question(s) addressed by each program.

- Receiving Water - Wet vs. Dry – No receiving water data were collected at the MLS in this WMA due to the rotational nature of the Permit. Stormwater Monitoring Coalition (SMC) and data from the previous monitoring season are presented for comparison purposes only. The SMC data for this year are only for dry weather. Results above the benchmarks included total dissolved solids (TDS), total nitrogen, and sulfate. In comparison, the wet weather priority constituents identified at the MLS in 2008-09 were total suspended solids (TSS), turbidity, and bacteria indicators. The SMC dry weather program did not include bacteria monitoring; therefore, the priority of bacteria in receiving waters in dry weather conditions cannot be determined from the available data.
- Receiving Water vs. MS4 – Wet Weather – No MLS or TWAS wet weather data were available for receiving waters for 2009-10. The MS4 data for wet weather flows indicated priority constituents include bacteria, TDS, nitrate/nitrite. For comparison purposes, the 2008-2009 wet weather results from the MLS identified bacteria as a priority constituent in both the MS4 outfalls and the receiving waters.
- Receiving Water vs. MS4 – Dry Weather – No MLS or TWAS dry weather data were available for receiving waters for 2009-10. For discussion purposes, in comparing the dry weather MS4 results with the SMC receiving water dry weather results, nutrients (total nitrogen) and TDS were identified as common priority constituents.
- MS4 – Wet vs. Dry Weather – The results of the MS4 outfall program indicated TDS, nutrients, and bacteria as priority constituents for both wet and dry weather flows at MS4 outfalls.

No toxicity was reported for the receiving water based on the SMC results for dry weather. The historical wet weather results from 2008 did not indicate toxicity. This is consistent with the chemistry results, which did not identify toxic priority constituents. Therefore, in accordance with the Permit, no action is necessary to address toxic chemicals. Bacteria, nutrients, TSS, and TDS were above the benchmarks, which are not defined as toxic constituents. However, TDS is identified as a potential regional concern.

The results of the SMC bioassessment survey indicated a Fair Index of Biotic Integrity (IBI) rating. The observed-to-expected ratio scores showed unimpaired (good) conditions. Physical habitat was also rated high (good). In considering potential management actions, the role of the high priority constituents listed in Table 2-2 should be assessed to determine the potential relationships.

Table 2-2 Summary of WMA Assessment Findings

Santa Margarita River MLS			
System Assessed	Annual Dry Weather Constituents of Concern¹	Annual Wet Weather Constituents of Concern¹	Core Questions Addressed
Receiving Water Monitoring (MLS, TWAS, and SMC)	<p>No MLS Sampling During 2009-10 Season (South County Rotation)</p> <p>2009-10 SMC Results (1 site) (for discussion purposes only)</p> <ul style="list-style-type: none"> • Chemistry –Sulfate, TDS, Total Nitrogen • Bioassessment – Fair (IBI) • Toxicity – None 	<p>No MLS Sampling During 2009-10 Season (South County Rotation)</p> <p>2008-09 Season Results (for comparison purposes only)</p> <ul style="list-style-type: none"> • Chemistry – TSS, Turbidity • Bacteria – Fecal Coliform • Toxicity - None • Synthetic Pyrethroids Assessment – Bifenthrin (wet weather) 	1, 2
Urban Runoff Monitoring (MS4 Outfall)	<ul style="list-style-type: none"> • Chemistry – Total Nitrogen, Nitrate/Nitrite, Nitrate (Med), Total Phosphorus, TDS • Bacteria –Enterococci, Fecal Coliform (Med) 	<ul style="list-style-type: none"> • Chemistry – TDS, Nitrate (Med), Nitrate/Nitrite (Med) • Bacteria – Fecal Coliform (Med) 	3, 4
MLS Trends*			
	Increasing	None	5
	Decreasing	Fecal Coliform	
<p>*Trends based on available data. Due to the rotational nature of the monitoring program, some years may not have recorded data.</p> <p>¹: Constituents of concern are determined following the Final Draft Annual Assessment Methodology developed during the 2009-2010 Monitoring Season.</p> <p>DWM – dry weather monitoring IBI – Index of Biotic Integrity Med - Medium Priority Constituent MLS - mass loading station MS4 - municipal separate storm sewer system</p> <p style="text-align: right;">SMC - Stormwater Monitoring Coalition TDS - total dissolved solids TSS - total suspended solids TWAS - temporary watershed assessment station</p>			

Figure 2-1 presents the locations of the Copermittee and SMC receiving water monitoring locations in addition to jurisdictional and HSA boundaries.

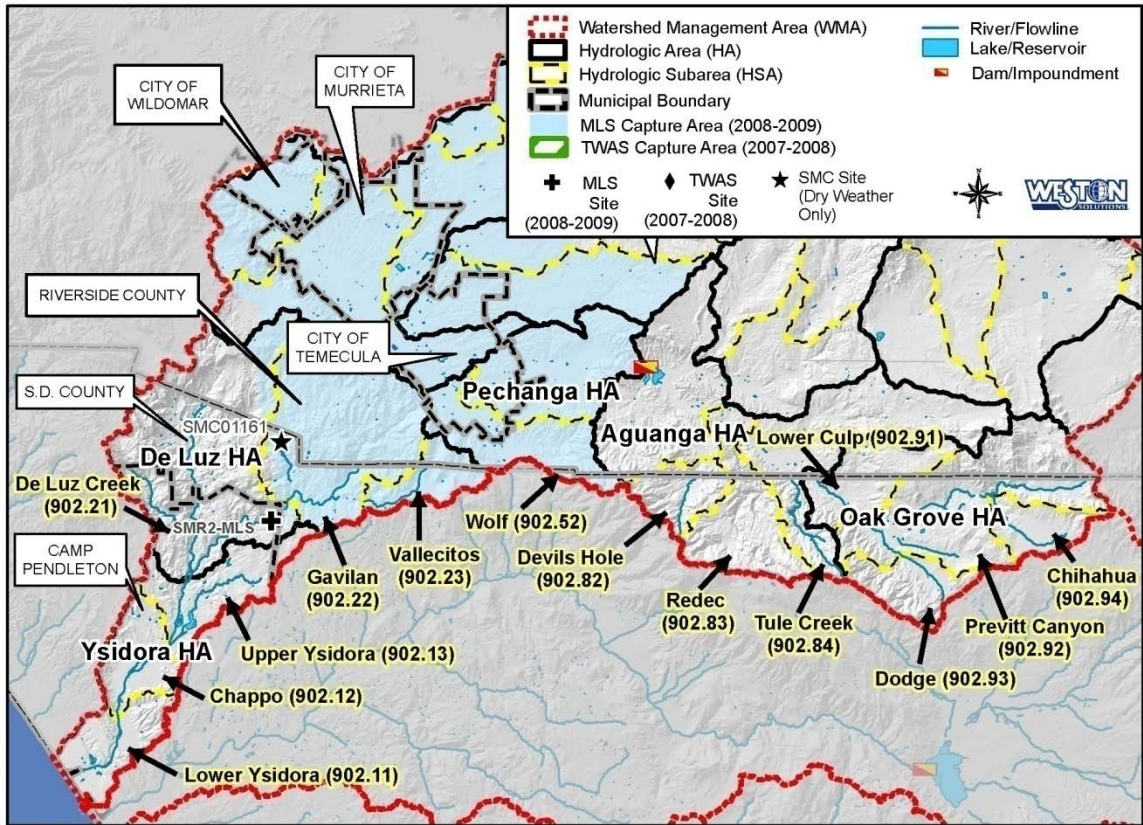


Figure 2-1 Location of MLS, TWAS, and HSAs – Santa Margarita River WMA

To facilitate spatial distribution analysis, Tables 2-3 and 2-4 display the priority constituents for wet and dry weather, respectively, with recent MS4 results by HSA. Table 2-3 presents the wet weather priority constituents identified for the receiving water (based on 2008-09 data) and the corresponding ratings for these same constituents in each HSA based on 2009-10 MS4 monitoring program results.

Table 2-3 Summary of Spatial Distribution of Priority Wet Weather Constituents

Station Type	HA	HSA	Parameter	Total Suspended Solids	Fecal Coliform	Turbidity	Bifenthrin
MS4 by HSA	Ysidora (902.1)	Lower Ysidora (902.11)	NA	NA	NA	NA	NA
		Chappo (902.12)	NA	NA	NA	NA	NA
		Upper Ysidora (902.13)	<i>n</i>	2	2	0	0
	% > Criteria		100%	100%	NA	NA	
	Deluz (902.2)	Deluz Creek (902.21)	<i>n</i>	2	2	0	0
			% > Criteria	0%	0%	NA	NA
		Gavilan (902.22)	NA	NA	NA	NA	NA
		Vallecitos (902.23)	<i>n</i>	2	2	2	2
	% > Criteria		0%	100%	NA	NA	
	SMR-MLS Summary (MS4 to RW Comparison)			MS4 (<i>n</i>)	4	4	4
MS4 (%) > Criteria				0%	50%	NA	NA
RW Score**				High*	High*	High*	High*

*One station was used in the summary.
 **No receiving water data for current year. 2008-09 MLS data used for SMR-MLS receiving water comparison. HAs without MS4 data are not listed and include Pechanga (902.5), Aguanga (902.8), and Oakgrove (902.9).

Key

High	> 50% Exceedance	HA - hydrologic area
Medium	> 25% and ≤ 50% Exceedance	HSA- hydrologic subarea
Low	≤ 25% Exceedance	MLS - mass loading station
No Data		MS4 - municipal separate storm sewer system
		NA – not available
		RW – receiving water
		SMR - Santa Margarita River

Table 2-4 provides dry weather priority constituents and the corresponding ratings for these same constituents by HSA based on 2009-10 MS4 monitoring data. With the exception of bacterial indicators, the constituents included in this table were above the benchmarks based on only a single grab sample at one SMC program site located in the Gavilan HSA. No MS4 data were collected in this HSA. Bacterial indicators data were not collected as a part of the SMC program, and so the addition of fecal coliform and Enterococcus to the list of priority constituents is based solely on the MS4 outfall data.

2-4 Summary of Spatial Distribution of Priority Dry Weather Constituents

Station Type	HA	HSA	Parameter	Total Nitrogen (calculated)	Total Dissolved Solids	Fecal Coliform	Enterococcus	Sulfate
MS4	Ysidora (902.1)	Lower Ysidora (902.11)	NA	NA	NA	NA	NA	NA
		Chappo (902.12)	NA	NA	NA	NA	NA	NA
		Upper Ysidora (902.13)	n	3	3	3	3	0
			% > Criteria	100%	100%	100%	67%	NA
	Deluz (902.2)	Deluz Creek (902.21)	n	2	2	2	2	1*
			% > Criteria	50%	50%	0%	0%	0%
		Gavilan (902.22)	n	3	3	3	3	0
			% > Criteria	100%	100%	0%	67%	NA
		Vallecitos (902.23)	n	2	2	2	2	0
			% > Criteria	100%	100%	100%	100%	NA
RW**	SMC 10061 (in Gavilan HSA)		Results	Above benchmarks*	Above benchmarks*	NA	NA	Above benchmarks*

*One station was used in the summary.

**No MLS data for current year. SMC based on a single grab sample. No MS4 stations in SMC drainage area. HAs without MS4 data are not listed and include Pechanga (902.5), Aguanga (902.8), and Oakgrove (902.9).

Key

High	> 50% Above benchmark
Medium	> 25% and ≤ 50% Above benchmark
Low	≤ 25% Above benchmark
No Data	

HA – hydrologic area
 HSA – hydrologic subarea
 MLS – mass loading station
 MS4 – municipal separate storm sewer system
 NA – not available
 RW – receiving water
 SMC – Stormwater Monitoring Coalition

Table 2.5 summarizes the §303(d) listed water bodies and constituents within the Santa Margarita River WMA, and identifies whether available data support the listings. Table 2-5 also identifies where there are no data, and whether total maximum daily loads (TMDLs) have been developed. As identified in the table, there are several listed waterbodies where data may be needed to verify the §303(d) listing.

Table 2-5 SMR WMA Assessment Conclusions in Relation to 2006 Section 303(d) listings

Waterbody Name	Hydrologic Subarea (HSA)	HSA No.	303(d) Listed Pollutant/Stressor	Supported by Regional Data	Supported by SMC/Third-Party Data	No Data	TMDL	Outside County
Santa Margarita Lagoon	Lower Ysidora	902.11	Eutrophic	✓	✓			
De Luz Creek	De Luz Creek	902.21	Iron and manganese			✓		
Rainbow Creek	Gavilan	902.22	Iron, sulfates, and TDS	✓		✓ Iron, sulfates		
Rainbow Creek	Gavilan	902.22	Nitrogen and phosphorus	✓			✓	
Upper Santa Margarita River	Gavilan	902.22	Phosphorus			✓		
Sandia Creek	Gavilan	902.22	Iron, manganese, nitrogen, sulfates, and TDS	✓		✓ Iron, sulfates		
Temecula Creek	Pauba	902.51	Nitrogen, phosphorus, and TDS					✓
Murrieta Creek	Wolf	902.52	Iron, manganese, nitrogen, and phosphorus					✓
Long Canyon Creek	Redec	902.83	TDS			✓		
Listing Source: SWRCB, 2006.								
SMC – Stormwater Monitoring Coalition SWRCB - State Water Resources Control Board TDS - total dissolved solids TMDL - total maximum daily load								

Provisional answers to the five core management questions are provided below. Since the Santa Margarita WMA was not sampled as a part of the Regional Monitoring Program during FY 2009-10, the answers have been formulated based on jurisdictional monitoring programs and SMC data, as well as historical regional monitoring data results. In addition to the information provided here, several water quality activities also included data collection and analyses that partially address portions of the core management questions. These activities include: the Rainbow Creek Water Quality Monitoring Program (SMR-011), the Santa Margarita Lagoon Investigative Order Monitoring Program (SMR-015), and the Water Quality Monitoring at Additional Mass Loading Stations (SMR-016) activities. A full description of these activities and associated supplementary reports can be found in Appendix A.

Core Management Question 1

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

Core Management Question 1 was addressed with receiving water data assessments and, in particular, the results of the triad assessment of chemistry, biology and toxicity data. The results of the 2008–09 monitoring during wet weather in the Santa Margarita River WMA indicate that fecal coliforms were identified as a high priority constituent. During 2010, ambient monitoring at the SMC site in Sandia Creek had results above benchmarks for sulfate, nitrogen, and TDS. This suggests that conditions in some receiving waters may not be protective of all assigned beneficial uses.

Historical stream bioassessment results indicate evidence of benthic community impairment in the Santa Margarita River WMA, with overall IBI ratings ranging from Fair to Poor. The most recent SMC survey yielded a Fair IBI rating. The site was located in the Sandia Creek drainage area. The low ratings noted at the MLS may be influenced by a number of factors, including poor in-stream physical habitat and the presence of pesticides (e.g., the synthetic pyrethroid Bifenthrin detected during wet weather monitoring) or other constituents monitored in this program. The bioassessment results suggest that the conditions in receiving waters may not be protective of all assigned beneficial uses.

During the 2008–09 monitoring season, there was no evidence of persistent toxicity at this site in ambient or wet weather monitoring. No toxicity was observed at the SMC monitoring site in Sandia Creek during 2010 dry weather monitoring. The lack of persistent toxicity suggests that the receiving waters are likely protective of toxicity-related beneficial uses.

Aspects of Core Management Question 1 are also partially addressed through analyses conducted as part of the Rainbow Creek Water Quality Monitoring Program (SMR-011) and the Santa Margarita Lagoon Investigative Order Monitoring Program (SMR-015) activities. A full description of these activities and supplementary reports can be found in Appendix A.

Core Management Question 2

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

Core Management Question 2 was addressed through spatial analysis of results and the frequency of the results above benchmarks. The spatial analysis is limited to the vicinity of the MLS. During the 2008-09 monitoring season, wet weather results above the benchmarks were greatest for TSS, turbidity, and fecal coliforms. The SMC survey in 2010 suggests that dry weather concentrations were slightly above the benchmarks for TDS, sulfate, and total nitrogen.

Historical stream bioassessment ratings conducted in the Santa Margarita River WMA indicate Poor benthic communities at the MLS and Santa Margarita River at Willow Glen Road sites, and Fair benthic communities at the reference site and Rainbow Creek sites. The overall rating of Poor at both the MLS and Santa Margarita River at Willow Glen Road sites suggests that the extent of the impairment on the benthic community is not isolated to one area. Fair ratings were observed at both the Rainbow Creek and Sandia Creek sites (Sandia Creek was a reference site and 2010 SMC site) suggesting little evidence of benthic alteration.

Aspects of Core Management Question 2 are also partially addressed through analyses conducted as part of the Rainbow Creek Water Quality Monitoring Program (SMR-011) and the Santa Margarita Lagoon Investigative Order Monitoring Program (SMR-015) activities. A full description of these activities and supplementary reports can be found in Appendix A.

Core Management Question 3

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

Core Management Question 3 was partially answered by the MS4 Outfall Monitoring Program. During wet weather, results showed that TDS, nitrate, and fecal coliform were identified as medium priority constituents. No high priority wet weather constituents were identified. During dry weather, MS4 results showed that TDS, total phosphorus, total nitrogen, and enterococcus were identified as high priority constituents. Fecal coliform and nitrate were identified as medium priority constituents. MS4 outfalls may contribute to receiving water problems for the constituents identified above. This question may be answered with a higher level of confidence in future years as the MS4 Outfall Monitoring Workplan was designed to produce statistically significant results after five years of monitoring.

Core Management Question 4

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

Core Management Question 4 is partially answered through land use analysis and limited monitoring data. More detailed discussion of urban runoff sources can be found in the County of San Diego's Jurisdictional Urban Runoff Monitoring Program Annual Report and in documents prepared for Rainbow Creek (rainbowcreek.org).

In addition, during FY 2009-10 the County of San Diego completed the *Parcel-Based Characterization of Nutrient Sources in the Rainbow Creek Watershed* (SMR-023), in order to better characterize nutrient-generating activities occurring within the Rainbow Creek Watershed. This study, which integrated a diverse array of available datasets, resulted in a GIS-based threat-to-water quality (TTWQ) assessment designed to convey the relative potential of each drainage area and parcel to contribute nutrient loading (total nitrogen, total phosphorous, and potential sediment sources) to the watershed. For a full description of this source characterization see the activity sheet for SMR- 023 in Attachment A.

Core Management Question 5

Are conditions in receiving waters getting better or worse?

Core Management Question 5 was addressed through trend analysis of historic wet weather Santa Margarita MLS constituent concentration data collected through 2007–08. Fecal coliform was the only constituent exhibiting a significant trend as its concentration decreased over the monitoring period. However, the most recent results collected during 2008-09 were above the Basin Plan water quality objective.

The bioassessment ratings at the Santa Margarita River MLS and reference site do not indicate observed changes in the benthic community over the period of monitoring from 2001 to 2010. IBI ratings at these two sites have been consistently Poor and Fair, respectively. IBI ratings for the Santa Margarita River at Willow Glen Road bioassessment site have ranged from Very Poor to Fair, with an overall rating of Poor. The IBI rating for the Rainbow Creek at Willow Glen Road bioassessment site was Fair during the only survey conducted at the site (May 2008). There are no apparent trends in benthic community.

Toxicity has occasionally been observed in samples collected from the Santa Margarita River MLS. Since 2001, toxicity has been observed three times for both the *C. dubia* reproduction test and the *H. azteca* survival test during wet weather conditions; however, no trends in the data are apparent.

2.1.3 Watershed Water Quality Problems

Section 3.1 of the March 2008 WURMP identifies criteria to be used to identify priority and high priority water quality problems within the Santa Margarita River WMA. Using these criteria, Table 2-6 identifies all watershed water quality problems and identifies the information used to support each finding. In summary, five priority watershed water quality problems have been identified, two of which are considered high priorities for the purposes of WURMP development and implementation: nutrients and sediment.

Table 2-6 Priority Water Quality Problems in the Santa Margarita River WMA

Water Quality Problem	High Priority?	Rationale & Scale
Nutrients	Yes	<ul style="list-style-type: none"> • Rainbow Creek TMDL for Total Nitrogen and Total Phosphorous (HA 902.2) • 303(d) listing for eutrophication in the Santa Margarita Lagoon (HA 902.1) • 303(d) listing for nitrogen in Sandia Creek (HA 902.2) • 303(d) listing for phosphorous in the Upper Santa Margarita River (HA 902.2) • BLTEA rating of “A” for Nutrients (HA 902.1 and HA 902.2) • High frequency of occurrence COC for total nitrogen, nitrate/nitrite, and total phosphorus in dry weather 2009-10 MS4 outfall monitoring • Medium frequency of occurrence COC for nitrate in dry weather 2009-10 MS4 outfall monitoring • Medium frequency of occurrence COC for nitrate, and nitrate/nitrite in wet weather 2009-10 MS4 outfall monitoring
Sediment	Yes	<ul style="list-style-type: none"> • High frequency of occurrence COC for TSS in wet weather 2009-10 MS4 outfall monitoring • High frequency of occurrence COC for TSS in wet weather 2009-10 receiving water conditions (based on single SMC site and 2008-09 MLS data) • High frequency of occurrence COC for turbidity in wet weather 2009-10 receiving water conditions (based on single SMC site and 2008-09 MLS data) • BLTEA rating of “A” for Sediment (HA 902.1)

Water Quality Problem	High Priority?	Rationale & Scale
Dissolved Minerals	No	<ul style="list-style-type: none"> • 303(d) listings for iron and manganese in De Luz Creek (HA 902.2) • 303(d) listings iron, sulfates, and TDS in Rainbow Creek (HA 902.2) • 303(d) listings for iron, manganese, sulfates, and TDS in Sandia Creek (HA 902.2) • 303(d) listing for TDS in Long Canyon Creek (HA 902.8) • BLTEA rating of “A” for Dissolved Minerals (HA 902.1 and HA 902.2) • High frequency of occurrence for TDS in dry weather 2009-10 MS4 outfall monitoring • High frequency of occurrence for TDS in wet weather 2009-10 MS4 outfall monitoring
Bacteria	No	<ul style="list-style-type: none"> • High frequency of occurrence COC for Enterococci in dry weather 2009-10 MS4 outfall monitoring • Medium frequency of occurrence COC for fecal coliform in dry and wet weather 2009-10 MS4 outfall monitoring • High frequency of occurrence COC for fecal coliform in wet weather receiving water conditions (based on single SMC site and 2008-09 MLS data)
Pesticides	No	<ul style="list-style-type: none"> • High frequency of occurrence COC for bifenthrin in wet weather 2009-10 receiving water conditions (based on single SMC site and 2008-09 MLS data) • BLTEA rating of “A” for Pesticides (HA 902.1)

2.2 Pollutant Source Assessment

This section identifies the pollutant sources likely to be causing the Santa Margarita River WMA’s high priority water quality problems. It focuses on pollutant sources within the lower portion of the watershed (HAs 902.1 and 902.2) because that is where nearly all of the urbanization and documented water quality problems exist. To identify likely pollutant sources, the County relied upon: 1) Source Loading Potential (SLP) and Threat to Water Quality (TTWQ) ratings from the BLTEA, 2) pollutant sources called out in the TMDL for Total Nitrogen and Total Phosphorous in Rainbow Creek, 3) sources addressed in the Santa Margarita River Watershed Management Plan (WMP), and 4) best professional judgment. Tables 2-7 and 2-8 also summarize relevant information from 2006 SANGIS land use data and the County of San Diego’s JURMP facility inventories. In addition, during FY 2009-10 the County of San Diego completed the *Parcel-Based Characterization of Nutrient Sources in the Rainbow Creek Watershed* (SMR-023), in order to better characterize nutrient-generating activities occurring on within the Rainbow Creek Watershed. This study, which integrated a diverse array of available datasets, resulted in a GIS-based threat-to-water quality (TTWQ) assessment designed to convey the relative potential of each drainage area and parcel to contribute nutrient loading (total nitrogen, total phosphorous, and potential sediment sources) to the watershed. For a full description of this source characterization see the activity sheet for SMR- 023 in Attachment A.

Table 2-7 Likely Sources of Nutrients in the Santa Margarita River WMA

LIKELY POLLUTANT SOURCE	HYDROLOGIC AREA	
	902.1	902.2
COMMERCIAL NURSERIES		
County of SD Commercial Facility Inventory	4	44
AGRICULTURAL FIELDS & ORCHARDS		
2006 SANGIS Land Use Data (Field Crops, Orchards/Vineyards)	618 acres	4,945 acres
RESIDENTIAL AREAS & ACTIVITIES		
2006 SANGIS Land Use Data (Single-Family Residential)	568 acres	148 acres
2006 SANGIS Land Use Data (Multi-Family Residential)	551 acres	8 acres
2006 SANGIS Land Use Data (Spaced Rural Residential)	65 acres	5,676 acres
Onsite Wastewater Systems	Unknown	Unknown
PARKS		
County of SD Municipal Facility Inventory (Active Parks)	1	1
2006 SANGIS Land Use Data (Active Parks)	4 acres	4 acres
County of SD Municipal Facility Inventory (Open Space Parks)	0	1
2006 SANGIS Land Use Data (Open Space Park / Preserve)	-	2,664 acres
COMMERCIAL ANIMAL FACILITIES		
County of SD Commercial Facility Inventory (Equestrian)	0	1
GOLF COURSES		
County of SD Commercial Facility Inventory	0	1
CEMETERIES		
County of SD Commercial Facility Inventory	1	0
2006 SANGIS Land Use Data	8 Acres	5 Acres
ROADS, STREETS, HIGHWAYS (LANDSCAPING)		
2006 SANGIS Land Use Data (Freeways, Road Right of Ways)	337 Acres	421 Acres
OTHER LIKELY SOURCES		
Air Deposition	N/A	N/A

Table 2-8 Likely Sources of Sediments in the Santa Margarita River WMA

LIKELY POLLUTANT SOURCE	HYDROLOGIC AREA	
	902.1	902.2
CONSTRUCTION SITES		
County of SD Construction Site Inventory	N/A	N/A
MOBILE SOURCES		
Regional Commercial Facility Inventory (General Contractors for Home and Commercial Improvements)	Under development	Under development
Regional Commercial Facility Inventory (Mobile Auto or Vehicle Washing)	Under development	Under development
COMMERCIAL NURSERIES		
County of SD Commercial Facility Inventory	4	44
AGRICULTURAL FIELDS & ORCHARDS		
2006 SANGIS Land Use Data (Field Crops, Orchards/Vineyards)	618 acres	4,945 acres
RESIDENTIAL AREAS & ACTIVITIES		
2006 SANGIS Land Use Data (Single-Family Residential)	568 acres	148 acres
2006 SANGIS Land Use Data (Multi-Family Residential)	551 acres	8 acres
2006 SANGIS Land Use Data (Spaced Rural Residential)	65 acres	5,676 acres
PARKS		
County of SD Municipal Facility Inventory (Active Parks)	1	1
2006 SANGIS Land Use Data (Active Parks)	4 acres	4 acres
County of SD Municipal Facility Inventory (Open Space Parks)	0	1
2006 SANGIS Land Use Data (Open Space Park / Preserve)	-	2,664 acres
EQUESTRIAN FACILITIES		
County of SD Commercial Facility Inventory	0	1
GOLF COURSES		
County of SD Commercial Facility Inventory	0	1
CEMETERIES		
County of SD Commercial Facility Inventory	1	0
2006 SANGIS Land Use Data	8 Acres	5 Acres
ROADS, STREETS, HIGHWAYS		
2006 SANGIS Land Use Data (Freeways, Road Right of Ways)	337 Acres	421 Acres
CORPORATE YARDS		
County of SD Municipal Facility Inventory	1	0
OTHER LIKELY SOURCES		
Hydromodification Resulting from Land Development	N/A	N/A

3 IMPLEMENTATION OF WATERSHED ACTIVITIES

This section describes watershed activities implemented by the County of San Diego during FY 2009-10 in support of the Santa Margarita River WURMP. It also updates the Five-Year Strategic Plan originally presented in the March 2008 WURMP document.

By definition in Municipal Permit section E.2.f.(1), WURMP activities may be implemented at the regional, watershed, or jurisdictional scale as long as they are focused on addressing the watershed's priority water quality problems. WURMP activities are generally above and beyond those implemented as part of baseline Jurisdictional Urban Runoff Management Program (JURMP) compliance. The Municipal Permit describes detailed criteria that an activity must meet to receive WURMP compliance credit. A minimum of two *Watershed Water Quality Activities (WWQAs)* and two *Watershed Education Activities (WEAs)* must be in an active implementation phase each year.

Sections 3.1 and 3.2 summarize WURMP activities implemented during FY 2009-10. Individual activities are presented in Appendix A using a standard activity sheet developed for use throughout the San Diego region. The activity sheets are designed to present all of the information required by Permit section J.3.b. In some cases, additional documentation (i.e., data summaries, maps, or supplemental reports) are attached to the activity sheets. Sections 3.3 and 3.4 describe public participation and collaborative land-use planning activities, respectively. Section 3.5 describes new activities not included in the FY 2008-09 WURMP Annual Report and presents an updated 5-Year WURMP Strategic Plan.

3.1 Watershed Water Quality Activities

Four *WWQAs* were in an active implementation phase during FY 2009-10:

- SMR-006 Focused Onsite Wastewater System Outreach
- SMR-008 Focused Horse and Small Animal Operator Outreach
- SMR-018 Cleanup Event Sponsorships
- SMR-021 Pet Waste Bag Dispenser Program in County Parks

Additional water quality activities included four special monitoring studies and source identification activities in the Santa Margarita River Watershed:

- SMR-011 Rainbow Creek Water Quality Monitoring Program
- SMR-015 Santa Margarita Lagoon Investigative Order Monitoring Program
- SMR-016 Water Quality Monitoring at Additional Mass Loading Stations
- SMR-025 Parcel-Based Characterization of Nutrient Sources in the Rainbow Creek Watershed

See Attachment A for individual activity summaries.

3.2 Watershed Education Activities

Five *WEAs* were in an active implementation phase during FY 2009-10:

- SMR-005 Rainbowcreek.org Web Site
- SMR-006 Focused Onsite Wastewater System Outreach

- SMR-007 Focused Grove and Nursery Outreach
- SMR-008 Focused Horse and Small Animal Operator Outreach
- SMR-010 Rainbow Valley Groundwater Monitoring Well Network

See Attachment A for individual activity summaries.

3.3 Public Participation Activities

Public participation occurred as part of the two WURMP activities listed below. Refer to Attachment A for details.

- SMR-005 Rainbowcreek.org Web Site
- SMR-018 Cleanup Event Sponsorships

In addition, the County of San Diego continued to maintain dedicated Santa Margarita River Watershed pages on the Project Clean Water Web site at www.projectcleanwater.org. During FY 2009-10, revisions were made to update the content and documents available via the site. There were 2,137 hits on the Santa Margarita River Watershed homepage and 715 hits on the WURMP page during FY 2009-10. Table 3-1 provides monthly statistics.

Table 3-1 Monthly Project Clean Water Web Hit Statistics (FY 2009-10)

Page	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Home	170	161	191	219	155	184	175	180	209	191	163	139	2,137
WURMP	41	50	56	83	79	67	42	37	85	58	60	57	715

3.4 Collaborative Land-Use Planning Efforts

Municipal Permit section E.2.d requires Watershed Copermittees to develop, implement, and modify, as necessary, a program for encouraging collaborative, watershed-based land use planning in their jurisdictional planning departments. This requirement has limited applicability to the Santa Margarita River WMA since the County is the sole permittee with jurisdiction in the portion of the watershed that is subject to the San Diego Municipal Stormwater Permit. Nevertheless, through development of the Santa Margarita Watershed Management Plan (WMP), the County has initiated watershed-based land use planning efforts that include entities having land management authority throughout the watershed.

The Santa Margarita River WMP identifies interagency coordination as “the backbone to any successful large-scale land management effort”. By identifying a set of prioritized actions, the WMP goes a long way toward focusing jurisdictional priorities on shared problems in the watershed. It also encourages inter-jurisdictional collaboration to achieve the goals it sets. The following is an “early action recommendation” from the WMP that will guide watershed-based land use planning efforts over the course of this Permit cycle:

- Form working groups that meet and discuss in more detail those issues that are of specific concern to them, and then report back to the larger watershed management group on their findings and recommendations.

Several watershed workgroups and committees have been formed to collaborate on important issues in the Santa Margarita River Watershed. During FY 2009-10, the County continued to actively participate in each of the watershed groups described below:

- Santa Margarita River Watershed Executive Management Team (EMT): a small group of agency representatives that contribute resources to conduct water-related studies in the watershed. The EMT looks forward to implementing actions recommended in the Santa Margarita River Watershed Management Plan (SMRWMP), the completion of which was coordinated by the County. Potential future activities include the formation of a non-profit watershed council and identification of a watershed coordinator.
- Santa Margarita River Watershed Water Quality Monitoring Group (WQMG): a larger stakeholder group of those that collect and use water quality data in the watershed. This group has identified the need for data sharing and a consistent approach to water quality monitoring so that data can be compared across the watershed. It has also identified the need to review and research the naturally occurring background levels within the watershed and to review and evaluate existing beneficial use designations.
- Santa Margarita Lagoon TMDL Group: a group consisting of the seven named dischargers that must comply with the Regional Water Quality Control Board's Investigative Order to collect data to support the development of total maximum daily load (TMDL) for the estuary.
- Santa Margarita River Watershed Stakeholder Advisory Committee (SAC): a forum for updating all interested parties on water-related issues throughout the watershed.

3.5 Updated 5-Year Strategic Plan

3.5.1 New Watershed Activities

One watershed activity has been added to the Five-Year Strategic Plan since the submittal of the FY 2008-09 WURMP Annual Report (see SMR-025 Parcel-Based Characterization of Nutrient Sources in the Rainbow Creek Watershed in Attachment A for details).

3.5.2 Updated 5-Year Strategic Plan

An updated Five-Year Strategic Plan is included as Attachment B. While activities planned through FY 2010-11 are well-documented, activity planning is ongoing for FY 2011-12 and beyond at the time of this writing. The list of potential activities presented in Attachment B will very likely be expanded in the future.

4 EFFECTIVENESS ASSESSMENT

4.1 Assessment of Overall WURMP Effectiveness

This section assesses WURMP effectiveness as a whole. The effectiveness of each watershed activity is assessed separately in Attachment A.

It is possible to assess overall WURMP effectiveness through qualitative measures. For example, the County of San Diego has fulfilled one of the primary intentions of the Municipal Permit's watershed requirements: to focus implementation of watershed activities on the watershed's highest priority water quality problems. The vast majority of watershed activities described in Section 3.0 and Attachment A are designed to address nutrients, sediments, or both. Nutrient impairments in Rainbow Creek have long been considered high priorities as reflected by the early adoption of TMDLs for nitrogen and phosphorous. At least ten activities reported in Attachment A were originally implemented to address nutrient sources within the Rainbow Creek Watershed. Several of these activities have now been expanded to encompass the entire watershed and will help to prevent future impairments through source control and BMP implementation.

With regard to fulfillment of targeted Level 1 outcomes, implementation during FY 2009-10 exceeded the minimum number of *Watershed Water Quality Activities (WWQAs)* and *Watershed Education Activities (WEAs)* required by the Municipal Permit. Four WWQAs were in active implementation and five WEAs were in an active implementation phase.

Five WEAs were in active implementation this reporting period, all of which were intended to increase knowledge and awareness (Level 2 outcomes). Three of these WEA included pre- and post-workshop assessment surveys, administered to assess knowledge gained as a result of the following workshops:

- February 3, 2010, Focused Horse and Small Animal Operator Outreach (SMR-008)
- May 20, 2010, Onsite Wastewater System Outreach (SMR-006)
- June 14, 2010, Focused Grove and Nursery Outreach (SMR-007)

The Onsite Wastewater System Outreach workshop (SMR-006) included the distribution of pre-workshop surveys to all participants, but no surveys were completed. However, eight post-workshop surveys were completed. Respondents were able to identify at least six BMPs for maintaining a healthy septic system and were also able to identify five signs of a failed septic system.

Survey results from the Focused Grove and Nursery Outreach workshop (SMR-007) indicated that a greater number of participants felt that agricultural activities significantly contributed to pollution in water bodies following the workshop. Prior to the workshop, only 50 percent of survey takers were able to identify appropriate BMPs, while after the workshop over 66 percent were able to correctly identify agricultural BMPs.

Surveys were also administered to participants of the County-wide manure composting workshops associated with the Focused Horse and Small Animal Operator Outreach activity (SMR-008). Prior to the workshops, 15 percent of participants responded that they live in a watershed, 43 percent responded that stormwater is not treated, 10 percent felt that horse manure contributes from "some to a great deal" to water pollution, and 59 percent suggested steps equestrians can take to prevent pollution caused by horse manure. Following the workshops, 90 percent of respondents indicated that they live in a watershed, 74 percent responded that

stormwater is not treated, 23 percent felt that horse manure contributes from “some to a great deal” to water pollution, and 83 percent suggested ideas equestrians can do to prevent pollution caused by horse manure.

Level 3 outcomes represent changes in targeted populations’ behavior or BMP implementation. Three activities included Level 3 Outcome effectiveness assessments during FY 2009-10. Following the Onsite Wastewater System Outreach workshop, three pumping rebate vouchers were distributed, indicating a small-scale behavioral change among participants. Survey results associated with the Horse and Small Animal Operator Outreach activity indicate a positive increase in knowledge and awareness about how equestrian activities can affect water quality. Post-workshop surveys demonstrated that more equestrians were able to identify positive behavioral change following the workshop. Additionally, cleanup events (SMR-018) conducted throughout the reporting period engaged the active participation of 165 volunteers.

Level 4 outcomes quantify or estimate pollutant load reductions for a project, site, or group of sites. These activities resulted in reductions of nutrient runoff, bacteria loading, and trash within the targeted activity sites. During FY 2009-10, the Onsite Wastewater System Outreach rebate program resulted in the removal of 1,100 gallons of sewage composed of 80 percent solids. It is estimated that the pet waste bag dispenser in Rainbow Park resulted in the removal of 646 pounds of dog waste, which translates to an unquantifiable reduction of bacteria and nutrients. Additionally, cleanup up events taking place in De Luz and Fallbrook were successful in removing 119,740 pounds of debris from the watershed.

Assessing the cumulative impact of WURMP activities on water quality improvements is complicated by several factors. First, it is challenging to quantify the cumulative impact of WURMP activities with respect to observed changes in MS4 discharge (Level 5 Outcome) and receiving water quality (Level 6 Outcome). Environmental changes in general are difficult to quantify due to natural variability. Although many BMP implementation projects are accompanied by project-specific monitoring, the effort required to establish causal links between MS4 discharges and receiving water quality at the watershed scale is not trivial. Copermittees have initiated several special projects to answer questions of causality, but full-scale watershed implementation is cost prohibitive. Second, it is difficult to isolate the impact of activities presented in the WURMP from the impact of jurisdictional or regional urban runoff management programs. The WURMP represents one of three implementation scales mandated by the Municipal Permit. All levels of implementation confer benefits on watershed water quality.

4.2 Assessment of TMDL BMP Implementation Plan

Although total maximum daily loads (TMDLs) for total nitrogen and total phosphorous in Rainbow Creek were adopted in 2006, no TMDL implementation plan has been formalized. However, many of the watershed activities described in Section 3.0 and Attachment A show the County’s active involvement in addressing nutrient impairments in the Rainbow Creek Watershed.

5 CONCLUSIONS AND RECOMMENDATIONS

Between July 2009 and June 2010, the County of San Diego conducted a comprehensive review and revision of the WURMP in compliance with the reissued Municipal Permit. The March 2008 WURMP document continued and extended Copermittee efforts to more efficiently use limited resources by focusing on efforts that maximize water quality benefits. It is clear that continued integration of regional, watershed, and jurisdictional programs is key to the development of quality programs that are cost-effective and responsive to the needs of the residents within the watershed.

REFERENCES

- California Regional Water Quality Control Board, San Diego Region. 2007, Order No. R9-2007-0001, NPDES Permit No. CAS0108758; Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District and the San Diego County Regional Airport Authority
- County of San Diego, 2008, Santa Margarita River Watershed Urban Runoff Management Plan, March 2008.
- San Diego County Regional Copermittees, 2010, Methodology for Annual and Long-Term Data Assessments for San Diego County Watershed Management Areas, Final Draft-Version 1, November 2010.
- Weston Solutions, Larry Walker Associates and Mikhail Ogawa Engineering, 2005, Baseline Long-Term Effectiveness Assessment (BLTEA), San Diego Stormwater Copermittees Jurisdictional Urban Runoff Management Program, August 2005.
- Weston Solutions, 2010, San Diego County Municipal Copermittees 2008-2009 Urban Runoff Monitoring Report, Prepared for County of San Diego, January 2010.
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