

**Watershed Urban Runoff Management Program
Fiscal Year 2008-09 Annual Report**

Santa Margarita River Watershed

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

on

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Prepared by the County of San Diego

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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 2008-09. 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 B describe 19 watershed activities that were in various phases of implementation during FY 2008-09. 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 ((#)) describes watershed activities that were implemented in previous years and are now completed. The name of each watershed activity in active implementation during FY 2008-09 is listed below:

- SMR-002 Portable Constructed Biofilter BMP Demonstration Project
- SMR-004 Irrigation System Consultation and Monitoring
- SMR-005 Rainbowcreek.org Web Site
- SMR-006 Rainbow Valley Onsite Wastewater System Outreach
- SMR-007 Rainbow Valley Grove and Nursery Outreach
- SMR-008 Rainbow Valley Horse and Small Animal Operator Outreach
- SMR-009 Rainbow Valley General Residential Outreach
- SMR-010 Rainbow Valley Groundwater Monitoring Well Network
- SMR-011 Rainbow Creek Water Quality Monitoring Program
- SMR-012 Vegetation and Compost Buffer Strip BMP Demonstration Project
- SMR-013 Irrigation and Fertilizer BMP Demonstration Project
- SMR-014 Agricultural Technology Transfer
- 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-020 LID & Watershed Planning Education for Community Planning/Sponsor Groups
- SMR-021 Pet Waste Bag Dispenser Program in County Parks.



County of San Diego

LAND USE AND ENVIRONMENT GROUP

CHANDRA L. WALLAR
DEPUTY CHIEF ADMINISTRATIVE OFFICER

1600 Pacific Highway, Room 212, San Diego, CA 92101
(619) 531-6256
Fax: (619) 531-5476

STATEMENT OF CERTIFICATION

Santa Margarita River Watershed Urban Runoff Management Plan (WURMP) FY 2008-09 Annual Report

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

Chandra Wallar

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

1-27-10

Date

1.0 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 2008-09. 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 2008-09, 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 the FY 2008-09 reporting period 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.

2.0 WATER QUALITY AND POLLUTANT SOURCE ASSESSMENT

This section assesses surface water quality and potential pollutant sources within the Santa Margarita River WMA. The water quality assessment in Section 2.1 is largely based on the regional monitoring program conducted by the San Diego County Municipal Stormwater Copermittees in compliance with Municipal Permit requirements. It is supplemented by other monitoring programs, including jurisdictional dry weather monitoring and special studies. The Copermittees' *2008-2009 Receiving Water and Urban Runoff Monitoring Annual Report* (Weston Report) provides a detailed watershed assessment based on results from this year's regional monitoring program (Weston, 2010). 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 2008-09 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 2008-09. Additional detail on each monitoring program can be found in the 2008-09 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 (2008-09)

Program Data Set	Type of Assessment	Constituents Assessed	2008-09 Activity
Permit-Related Monitoring (see 2008-09 Weston Report for additional details)			
Mass Loading Station (MLS)	Wet Weather Receiving Water	Toxicity, chemistry	1 site (MLS) sampled during 1 storm event
Post-Storm Sediment Pyrethroid Monitoring	Wet Weather Receiving Water	Grain size, synthetic pyrethroid pesticides, and TOC	1 site (MLS) sampled following 1 storm event
Jurisdictional Dry Weather Monitoring (DWM)	Ambient Urban Runoff	Field parameters and chemistry	4 sites sampled at varying frequencies
Coastal Storm Drain Monitoring (CSDM) Program	Ambient Receiving Water & Urban Runoff	Fecal indicator bacteria	11 samples taken from storm drains and 9 from receiving waters during dry weather conditions. 11 samples taken from storm drains and 10 from receiving waters during wet weather conditions.
MS4 Outfall Monitoring (Random Wet, Random Dry, Targeted Dry)	Ambient and Wet Weather Urban Runoff	Chemistry and fecal indicator bacteria	Sites visited once during reporting year: Random Dry: 10 sites Random Wet: 4 sites Targeted Dry: 6 sites
Bight 2008 Estuary Monitoring	Ambient Receiving Water	Water and sediment chemistry, sediment toxicity, pyrethroids, trace metals, PCBs, PAHs, and benthic infauna	5 sites sampled once during ambient conditions

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Special Studies (see Attachment A for additional details)			
Rainbow Creek Water Quality Monitoring Program (SMR-011)	Ambient Receiving Water	Field parameters, nitrate, nitrite, total kjeldahl nitrogen, ammonia, orthophosphate, total phosphorous, TDS	13 sites sampled approximately monthly
Water Quality Monitoring at Additional MLS (SMR-016)	Ambient and Wet Weather Receiving Water	Field parameters, ammonia-N, total iron, total manganese, nitrate-N, nitrite-N, orthophosphate, total kjeldahl nitrogen, total phosphate-P, TDS, sulfates	2 sites sampled during 2 storm events and 2 ambient events

2.1.2 2008-09 Water Quality Monitoring Results

Table 2-2 summarizes results from the regional and dry weather monitoring programs as presented in the 2008-2009 Weston Report. Data are segregated and analyzed according to whether they are representative of wet weather or ambient conditions. A distinction is also made between data indicative of either receiving water conditions or urban runoff discharges. 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. Provisional answers to each core management question are discussed below.

Table 2-2 Summary of WMA Assessment Findings

	Monitoring Program Elements	Summary of Findings	Core Questions Addressed
Receiving Waters Monitoring Program	Ambient Receiving Water Assessment	<ul style="list-style-type: none"> ▪ Constituent Summary: <ul style="list-style-type: none"> - TDS and total nitrogen > benchmark in 100% of samples (based on 2007-08 data). ▪ Ambient monitoring was not conducted in the Santa Margarita River WMA due to the random site selection process in the Stormwater Monitoring Coalition (SMC) Program 	1,2
	Wet Weather Receiving Water Assessment	<ul style="list-style-type: none"> ▪ Constituents of concern¹: <ul style="list-style-type: none"> - High frequency of occurrence (fecal coliform) - Medium frequency of occurrence (TSS and turbidity) ▪ Constituents with a magnitude of exceedance more than five times the benchmark included: TSS, turbidity and fecal coliform. ▪ No persistent toxicity was observed. 	
	Rapid Stream Bioassessment	<ul style="list-style-type: none"> ▪ Historic benthic macroinvertebrate IBI ratings of Poor were observed at Willow Glen and De Luz Road suggesting some evidence of benthic alteration. Fair ratings were observed at Rainbow Creek and Sandia Creek (reference site) suggesting little evidence of benthic alteration. 	

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

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	Monitoring Program Elements	Summary of Findings	Core Questions Addressed
	Bight '08	<ul style="list-style-type: none"> ▪ Data from the Santa Margarita Estuary indicated concentrations of bacteria and TSS were below benchmarks in all samples. ▪ Sediment results identified three sites as “likely unimpacted” and two sites as “unimpacted” based on SQO Guidelines. 	
Urban Runoff Monitoring Program	Ambient Urban Runoff Areas Assessment (Jurisdictional, MS4 outfall monitoring, and CSDM)	<ul style="list-style-type: none"> ▪ Results above action level or receiving water benchmarks: <ul style="list-style-type: none"> - Jurisdictional: No data - MS4: TDS, TSS, Nitrate, Nitrate/Nitrite, Total nitrogen, Total phosphorus, Fecal coliform, Enterococci, Total iron ▪ Results suggest that the MS4 discharges may have the potential to contribute to receiving water problems for some constituents such as TDS and enterococci. ▪ CSDM: coastal storm drains do not impact coastal receiving waters with any regular frequency. 	3, 4
	Wet Weather Urban Runoff Areas Assessment (MS4 Outfall Monitoring)	<ul style="list-style-type: none"> ▪ The MS4 random wet weather data suggest that at most sites, loads appear to have been influenced by the characteristics of the catchment, particularly land use and drainage area. Additional monitoring is needed to assess the extent to which wet weather effluent from the MS4 influences receiving water conditions. ▪ CSDM: coastal storm drains do not impact coastal receiving waters with any regular frequency. 	
WMA Assessment	Receiving Water Trend Assessment	<ul style="list-style-type: none"> ▪ No significantly increasing trends were evident. ▪ Significantly decreasing trends were observed for fecal coliform 	5
	2001–2006 Baseline Long-Term Effectiveness Assessment Ratings	<ul style="list-style-type: none"> ▪ WMA high frequency of occurrence rating for fecal coliform was consistent with the 2001–2006 BLTEA ratings for bacteria/pathogens. 	

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 the ambient and wet weather data assessments. The results of the 2008–2009 monitoring program in the Santa Margarita River WMA indicate that some of the constituents monitored were identified as high frequency of occurrence COCs whose concentrations have frequently exceeded their respective benchmarks. In the Santa Margarita River WMA, these COCs included TDS, total nitrogen, Bifenthrin, and fecal coliform. This suggests that some beneficial uses may be impaired by these constituents.

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 low ratings may be influenced by a number of factors, including poor in-stream physical habitat, the presence of pesticides (e.g., the synthetic pyrethroid Bifenthrin detected during wet weather monitoring), or other constituents not monitored in this program. The bioassessment results suggest that the receiving waters may not be protective of beneficial uses.

During the 2008–2009 monitoring season, toxicity studies related to the reproduction of *C. dubia* and the survival of *H. azteca* during wet weather conditions in the Santa Margarita River WMA were conducted on December 16, 2008, at the MLS. It should be noted that this is a new location due to previous monitoring occurring downstream, within Camp Pendleton’s jurisdiction. In previous years, toxicity has been sporadic and infrequent in this WMA. Since 2001, toxicity to *C. dubia* and *H. azteca* has been observed three times for each species. There is no evidence of persistent toxicity at this site in ambient or wet weather monitoring. The lack of persistent toxicity at this site indicates that the receiving waters are likely protective of beneficial uses.

Bight ‘08 data collected in Santa Margarita Lagoon suggest that conditions are generally protective of the beneficial uses. All five sediment quality sites assessed were either “unimpacted” or “likely unimpacted” based on the SQO guidelines. Additionally, water quality samples collected for fecal indicator bacteria and TSS were below Basin Plan standards.

Core Management Question 2

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

Core Management Question 2 was addressed with magnitude of exceedance ratios for wet weather conditions in the receiving waters, historical bioassessment ratings, and Bight ‘08 spatial characterization results. Wet weather monitoring was conducted only once at the MLS in 2008–2009 due to participation in the Bight ‘08 Program.

Ambient conditions in the receiving waters of the Santa Margarita River WMA were not assessed as part of the SMC Program; therefore, assessments to determine the magnitude of exceedance ratios for ambient conditions could not be conducted. Concentration-to-benchmark ratios during wet weather at the MLS were greatest for TSS, turbidity, and fecal coliform. The TSS, turbidity, and fecal coliform concentrations during the 2008 storm event were approximately 12, 43, and 58 times greater than the associated benchmark, respectively. TSS, turbidity, and fecal coliform have historically exceeded benchmarks at the MLS during wet weather, with concentrations on average exceeding the benchmark by over five, eleven, and two times, respectively.

In 2008–2009, bioassessment monitoring was not conducted in the Santa Margarita River WMA as part of the SMC Program. Historical stream bioassessment ratings 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 at Willow Glen Road 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 Rainbow Creek and Sandia Creek (reference site) suggesting little evidence of benthic alteration.

The Copermittees developed their Bight '08 Monitoring Program to provide spatial characterization of the lagoon using a transect design with five samples. The lagoon was segmented into five equidistant portions, and samples were selected randomly following the Bight '08 sampling protocols. As mentioned above, all sites were either "unimpacted" or "likely unimpacted". The Bifenthrin concentration at only one location (Site 6311) was above the LC₅₀ for *E. estuarius*, which occurred near the southern middle portion of the lagoon. In terms of the magnitude of the potential receiving waters problem, all sediment chemistry LOE scores were either low or minimal, and all sediment toxicity LOE scores were non-toxic. The benthic community LOE scores were either moderate or low. Moderate benthic scores at the two inner sites did not appear to be related to sediment chemistry or toxicity and may reflect the variability of physical characteristics within the lagoon.

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. In 2008–2009, the Santa Margarita River WMA MS4 was assessed through the random dry, random wet, and targeted dry weather surveys.

Ten sites were visited as part of the random dry weather program, of which, six were monitored. Concentrations of nitrate, total nitrogen, total phosphorus, and indicator bacteria (i.e., enterococci and fecal coliform) were greater than their respective benchmarks in at least one of the six sites sampled. The results suggest that effluent from the MS4 has the potential to contribute to receiving water problems at those locations where benchmarks were exceeded. A comparison of instantaneous loads based on constituent concentrations and flow at the time of the survey suggests that loads were greatest where flow rates were highest, which occurred at one site in the De Luz HA. MS4 runoff from this site may have a greater potential for contributing to the receiving waters because of the greater instantaneous loads measured at the time of the surveys. The 2008–2009 targeted MS4 monitoring data allow for a relative comparison of instantaneous loads among sites in the Santa Margarita River WMA; however, these results, representing only one year of data collection, should not yet be considered representative of all MS4 dry weather runoff. Further study would be needed to assess and verify the temporal impact from specific sites, as instantaneous loads only represent a snapshot in time.

Four sites were assessed during storm events as part of the random wet weather program. Concentrations of total nitrogen, total phosphorus, and indicator bacteria (i.e., fecal coliform) were greater than benchmarks at all sites, suggesting that wet weather runoff from the MS4 may have the potential to contribute to receiving water problems at these locations. However, it is important to note that the benchmarks used in the assessment are applicable only to receiving waters and do not apply directly to runoff emanating from the MS4. The benchmarks have been used only to help identify areas where MS4 runoff has the potential to contribute to receiving water problems, thus addressing Core Management Question 3. Normalized loads calculated for the sites assessed were greatest at sites MS4W-SMR-02 and MS4W-SMR-12, which have the

largest drainages. Both of these sites are located in the upper region of HSA 902.13 (Ysidora HA). The catchments of all sites consist primarily of residential land use areas.

A total of six sites in the Santa Margarita River WMA were visited as part of the targeted dry weather program, five of which were flowing at the time of the survey. The chemistry data from flowing sites were used to address Core Management Question 3 by comparing concentrations of chemical analytes in the MS4 runoff to receiving benchmarks for the following constituents: nitrate, total nitrogen, total phosphorus, sulfate, TDS, total iron, total manganese, Chlorpyrifos, Diazinon, Malathion, and indicator bacteria (i.e., fecal coliforms and enterococci). With the exception of nitrate, Chlorpyrifos, Diazinon, and Malathion, each of these constituents exceeded its respective benchmark concentration at least one of the five sites assessed. Concentrations of TDS and enterococci exceeded the benchmark most frequently. The results suggest that effluent from the MS4 has the potential to contribute to receiving water problems at those locations where benchmarks were exceeded. A comparison of instantaneous loads, based on constituent concentrations and flow at the time of the survey, suggests that loads were greatest where flow rates were highest, at Site CT-SMG07 in the De Luz HA. MS4 runoff from this site may have a greater potential for contributing to the receiving waters because of the greater instantaneous loads measured at the time of the surveys. The 2008–2009 targeted MS4 monitoring data allow for a relative comparison of instantaneous loads among sites in the Santa Margarita River WMA; however, the results should not yet be considered representative of dry weather MS4 runoff in the watershed. More meaningful spatial comparisons can be made as a more robust data set is developed in subsequent years. Additional temporal data will help address sub-question 2 (Are pollutant loadings changing over time?) in future assessments.

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. The Jurisdictional DWM Program and the receiving waters trash assessment provide some information about urban runoff sources. More detailed discussion of urban runoff sources can be found in the County's Jurisdictional Urban Runoff Monitoring Program Annual Report.

The trash assessment conducted in 2008–2009 as part of the Jurisdictional DWM Program was used to identify sources of trash in the Santa Margarita River WMA. A total of four sites were assessed for trash in the WMA, including two HSAs within the De Luz HA. All sites assessed for trash had Optimal ratings (i.e., less than 10 pieces of trash), indicating little or no trash. No sites were identified as Sub-marginal or Poor; therefore, trash type and route were not characterized. No sites were identified as a potential threat to human or aquatic health.

A dry weather source identification study of single family residences was conducted by the regional Copermitees in a different watershed during the 2008–2009 monitoring season. Results indicated that synthetic pyrethroids were commonly detected in runoff from residential land uses in concentrations above published toxicity benchmarks for aquatic invertebrates. However, the Stormwater Monitoring Coalition suggests that the synthetic pyrethroid analytical method may be highly variable (Schiff, 2009). Pyrethroid benchmarks presented in this document are for comparison purposes only and for further assessment with toxicity results. Bacteria results were generally higher at sites influenced by overland runoff in comparison to one site influenced by continuous groundwater flows. Additionally, nitrate, chloride, and elevated conductivities were

associated with areas influenced by groundwater discharges (which may be a result of perched water tables).

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 2007–2008. Fecal coliform were the only constituent exhibiting a significant trend as its concentration decreased over the monitoring period.

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 2008. 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; 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 2-3 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 2-3. 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)
Sediment	Yes	<ul style="list-style-type: none"> • Medium frequency of occurrence COC for turbidity in wet weather receiving water conditions as identified in the 2008-09 Weston Report • Medium frequency of occurrence COC for TSS in wet weather receiving water conditions as identified in 2008-09 Weston Report • BLTEA rating of “A” for Sediment (HA 902.1)

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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) • High frequency of occurrence for TDS in ambient receiving water conditions as identified in 2008-09 Weston Report • BLTEA rating of “A” for Dissolved Minerals (HA 902.1 and HA 902.2)
Bacteria	No	<ul style="list-style-type: none"> • High frequency of occurrence COC for fecal coliform in wet weather receiving water conditions as identified in 2008-09 Weston Report
Pesticides	No	<ul style="list-style-type: none"> • 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 2-4 and 2-5 also summarize relevant information from 2006 SANGIS land use data and the County of San Diego’s JURMP facility inventories.

Table 2-4. 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

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LIKELY POLLUTANT SOURCE	HYDROLOGIC AREA	
	902.1	902.2
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 2-5. 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

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LIKELY POLLUTANT SOURCE	HYDROLOGIC AREA	
	902.1	902.2
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

3.0 IMPLEMENTATION OF WATERSHED ACTIVITIES

This section describes watershed activities implemented by the County of San Diego during FY 2008-09 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. This report also summarizes activities for which the County does not receive WURMP compliance credit (i.e., water quality monitoring, source identification), but are important in the overall goal of improving water quality.

Sections 3.1 and 3.2 describe WURMP activities implemented during FY 2008-09 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 2007-08 WUMRP Annual Report and presents an updated 5-Year WURMP Strategic Plan.

3.1 Watershed Water Quality Activities

Six *WWQAs* were in an active implementation phase during FY 2008-09:

- SMR-002 Portable Constructed Biofilter BMP Demonstration Project
- SMR-004 Irrigation System Consultation and Monitoring
- SMR-012 Vegetation and Compost Buffer Strip BMP Demonstration Project
- SMR-013 Irrigation and Fertilizer BMP Demonstration Project
- SMR-018 Cleanup Event Sponsorships
- SMR-021 Pet Waste Bag Dispenser Program in County Parks

Additional water quality activities included three special monitoring studies 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

See Attachment A for individual activity summaries.

3.2 Watershed Education Activities

Eight *WEAs* were in an active implementation phase during FY 2008-09:

- SMR-005 Rainbowcreek.org Web Site
- SMR-006 Rainbow Valley Onsite Wastewater System Outreach
- SMR-007 Rainbow Valley Grove and Nursery Outreach
- SMR-008 Rainbow Valley Horse and Small Animal Operator Outreach
- SMR-009 Rainbow Valley General Residential Outreach
- SMR-010 Rainbow Valley Groundwater Monitoring Well Network
- SMR-014 Agricultural Technology Transfer
- SMR-020 LID & Watershed Planning Education for Community Planning/Sponsor Groups

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 the FY 2008-09 reporting period, revisions were made to update the content and documents available via the site. There were 2,033 hits on the Santa Margarita River Watershed homepage and 681 hits on the WURMP page during FY 2008-09. Table 3-1 provides monthly statistics.

Table 3-1 Monthly Project Clean Water Web Hit Statistics (FY 2007-08)

Page	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Home	191	150	150	173	177	170	184	194	162	163	155	164
WURMP	67	62	49	73	72	51	54	61	55	51	36	50

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 2008-09, 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.

In addition to these efforts, the County has embraced the potential of low impact development (LID) approaches to effectively address the impact of pollutants and discharge volumes resulting from new and significant re-development. In addition to the education and training that is provided to the development community and municipal staff as part of baseline JURMP compliance, targeted LID efforts during this reporting period included the County's implementation of *SMR-020: LID and Watershed Planning Education for Community Planning/Sponsor Groups*. This activity educated local planning and sponsor groups on LID and watershed planning principles, practices, and requirements. The recommendations of local planning and sponsor groups have influence over whether, and under what conditions, development projects within the unincorporated County are approved. This education activity was intended to aid these advisory bodies in making informed recommendations on aspects of development projects that could affect watershed water quality. Presentations to planning and sponsor groups within the Santa Margarita River Watershed (see list below) were conducted on the following dates:

- Fallbrook (8/18/08)
- Pala-Pauma (5/5/09)

For additional information on *SMR-020: LID and Watershed Planning Education for Community Planning/Sponsor Groups*, please refer to Attachment A for details.

3.5 Updated 5-Year Strategic Plan

3.5.1 New Watershed Activities

Two watershed activities were added to the Five-Year Strategic Plan since the submittal of the FY 2007-08 WURMP Annual Report. Please see Attachment A (*SMR-023 Parcel Based Characterization of Nutrient Sources in the Rainbow Creek Watershed* and *SMR-024 Fallbrook Library Green Roof*) 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 2009-10 are well-documented, activity planning is ongoing for FY 2010-11 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.

4.0 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 the summary sheets provided 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 focused specifically on the Rainbow Creek Watershed. Additional demonstration projects and special monitoring studies are applicable watershed wide and will provide information for analyzing and selecting future BMPs for implementation.

With regard to fulfillment of targeted Level 1 outcomes, implementation during FY 2008-09 exceeded the minimum number of *Watershed Water Quality Activities (WWQAs)* and *Watershed Education Activities (WEAs)* required by the Municipal Permit. Six WWQAs were in active implementation, or 300% of the targeted goal of two. Eight WEAs were in an active implementation phase, or 400% of the targeted goal of two.

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

- The May 30th, 2007 Onsite Wastewater System Outreach (SMR-006)
- The September 17th, 2007 Horse and Small Animal Operator Outreach (SMR-008)
- The May 31st, 2006 & January 9th, 2008 General Residential Outreach (SMR-009)

Responses to the Onsite Wastewater System Outreach workshop (SMR-006) indicated that the workshop made participants more aware of how septic systems can affect the water quality in Rainbow Creek and 87.5% of respondents discussed the workshop with friends, family or neighbors. In the case of the Horse and Small Animal Operator Outreach workshop, 100% of the participants indicated that the workshop made them more aware of how manure can affect the water quality in Rainbow Creek and that they discussed the workshop with family, friends or neighbors. Of the General Residential Outreach workshop attendees, 100% of respondents felt that the meeting(s) they attended were informative and helpful. Almost all (90%) learned about how Rainbow Creek can be polluted, 80% felt that they now pay more attention to stormwater runoff since they attended the meetings, and 90% discussed the meeting(s) with family, friends or neighbors.

Additionally, two WEA activities used pre- and post-presentation questionnaires to assess increases in knowledge. Questionnaires were administered to participants of the Agricultural Technology Transfer activity (SMR-014) and the LID and Watershed Planning Education presentations (SMR-020). SMR-014 participant knowledge increased as a result of the workshops and tours, jumping 5% from 84% in the pre-presentation to 89% in the post-presentation

assessment. SMR-020 Pre- and post-presentation questionnaires showed a 15% increase in knowledge regarding watershed planning and LID principles increased as result of the presentation.

Level 3 outcomes represent changes in targeted population's behavior or BMP implementation. Two WQA and two WEA activities included level 3 effectiveness assessments this reporting period. Post-workshop surveys of the FY 2007-08 onsite wastewater system outreach workshop (SMR-006) indicated that 37.5% of participants had their septic systems pumped as a result of what they learned at the workshop. Grove and nursery outreach efforts (SMR-007) did not result in a measurable change in behavior among those participating in the program. One nursery was re-visited to determine whether management practice recommendations had been implemented, and inspectors found no changes in irrigation practices. Subsequently, calls were placed to the other groves and nursery operators that participated in the irrigation evaluations and found it was determined that they too had not made changes. The current water use cutbacks within the agriculture sector, plus the high cost of system upgrades, has resulted in many growers stumping trees and capping off the unused irrigation systems rather than to improve the system efficiencies. The installation of a new pet waste bag dispenser in Rainbow Park (SMR-021) facilitated waste removal behaviors among park users. Additionally, Cleanup events (SMR-018) conducted throughout the reporting period engaged the active participation of 125 volunteers.

Level 4 outcomes quantify the estimates of pollutant load reductions for a project, site, or group of sites. Five WQA included level 4 outcome assessments during the FY 2008-09 reporting period. These activities resulted in reductions of irrigation water usage, nutrient runoff, bacteria loading, and trash within the targeted activity sites.

In activity SMR-002, nutrient concentrations and runoff flow rates were monitored in the brow ditch immediately upstream and downstream of the constructed biofilter location, and at a location further downstream from the BMP location to determine the effectiveness of the BMP in reducing nutrient loads in runoff (Level 4). The field deployment of the constructed biofilter resulted in an average reduction in total nitrogen ranging from 30% to 56% removal from the top to the bottom of the ditch when the flow was <6" and the average reduction in nitrate nitrogen ranged from 16% to 41% removal.

Through the consultation and assistance provided in activity SMR-004 the study property reduced water use by 30% over the previous year's use during the same time frame. This 30% reduction in water usage will likely result in a similar reduction in runoff volume, since most of the water is targeted to plants and is now being captured instead of washing through the pots. The switch to the time-released fertilizer is expected to save as much as 50% of the applied nutrients.

The compost and vegetated buffer strips installed for activity SMR-012 were effective at reducing nutrients and sediment in runoff from both the experimental and the commercial nurseries. Sediment concentrations were reduced by 57% while only slight reductions were observed for nutrient concentrations. Due to the very high absorptive capacity of the compost, large volumes of runoff were absorbed by the buffers resulting in significant reductions in mass export of nutrients and sediment from the nurseries to the receiving waters. For the compost buffers, the median reductions in mass exports were: 72% for sediment, 57% for nitrate, 44% for ammonia, 73% for total kjeldahl nitrogen, 56% for orthophosphate, and 72% for total phosphorus.

In activity SMR-013, changes to irrigation practices and fertilizer application resulted in a significant reduction of water usage. These changes to irrigation practices translated to 16%

reduction in the amount of water necessary to irrigate avocado trees and a 42% reduction for nursery plants, while not adversely affecting plant health.

It is estimated that the installation of the pet waste bag dispenser in Rainbow Park resulted in the removal of 640 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 94,468 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.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Between July 2008 and June 2009, 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 resources 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

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