Coordinated Integrated Monitoring Program for Malibu Creek Watershed

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Executive Summary

The Coordinated Integrated Monitoring Program (CIMP) for Malibu Creek Watershed (MCW) was developed to gather data in order to evaluate water quality and the effectiveness of compliance measures in the MCW. The monitoring sites for receiving water monitoring, outfall monitoring, and special studies were selected to represent the water quality of the waterbodies in the MCW, the impact of Municipal Separate Storm Sewer System (MS4) discharges, and the effectiveness of Best Management Practices (BMPs).

The CIMP is coordinated with several parts of the Enhanced Watershed Management Program (EWMP) including the Reasonable Assurance Analysis (RAA) water quality model. The CIMP monitoring data is used to validate the predictions of the model and evaluate the impact of programmatic and other BMP measures on receiving water quality. The calibrated model is then used in the EWMP to assess the benefit of various BMP implementation scenarios.

The National Pollutant Discharge Elimination System (NPDES) MS4 Permit Order No. R4-2012-0175 (Permit) establishes water quality monitoring requirements for stormwater and non-stormwater discharges within the coastal watersheds of Los Angeles County. In compliance with the Permit, this CIMP includes monitoring procedures for:

- Receiving water monitoring;
- Stormwater outfall based monitoring;
- Non-stormwater outfall based monitoring;
- New development/re-development effectiveness tracking; and
- Regional studies.

The receiving water monitoring sites were selected to meet the requirements of the MS4 permit and to characterize subwatersheds draining to major reach segments within the Malibu watershed. Outfall monitoring will provide additional information to characterize potential sources of pollutants to the receiving water bodies, where impairments are known or identified in the CIMP monitoring program. The proposed monitoring sites are shown in Figure ES-1.

The Permit allows the flexibility to coordinate and streamline monitoring efforts to meet the Permit water quality compliance monitoring requirements through development of a CIMP. The Cities of Agoura Hills, Calabasas, Hidden Hills, and Westlake Village, the County of Los Angeles, and the Los Angeles County Flood Control District (LAFCD) worked together to develop the CIMP for the Malibu Creek Watershed.

This CIMP covers the portion of the Malibu Creek Watershed within the County of Los Angeles and upstream of the City of Malibu. Because Malibu Creek drains to Santa Monica Bay, which also has Total Maximum Daily Loads (TMDLs) and 303(d) listed impairments, the CIMP outlines a plan to estimate the loads from the CIMP area to Santa Monica Bay.

Malibu Creek Watershed

The Malibu Creek Watershed is located in the Los Angeles and Ventura Counties in Southern California. The watershed covers a 109 square mile area from the Santa Monica Mountains to Santa Monica Bay. The Malibu Creek Watershed includes several streams and lakes that flow primarily to the south and southeast directions into Malibu Creek and toward Malibu Lagoon and the Pacific Coast.

Several tributaries and lakes in the watershed have TMDLs and are included in the 303(d) list for water quality due to impairments of beneficial uses. TMDLs in the Malibu Creek Watershed have been developed for bacteria, trash, nutrients, and sediment related impairments. In addition, Santa Monica Bay has several TMDLs, including bacteria, trash (debris), DDTs, and PCBs. The Santa Monica Bay TMDLs

for bacteria and trash integrate the TMDL waste load allocations from the Malibu Creek TMDL. Therefore, with the exception of the PCBs and DDTs TMDLs, compliance with the Santa Monica Bay TMDLs for jurisdictions in the Malibu Creek Watershed is based on the Malibu Creek TMDL allocations. Compliance with the PCBs and DDTs TMDLs is based on the waste load allocations assigned in the MS4 permit.

The Malibu Creek Watershed poses significant challenges for monitoring activities. The watershed has topography that limits safe access, such as steep ravines and densely vegetated riparian corridors. In addition, sensitive habitat and private property requires that permission be granted and other precautions be used to access certain areas.

Integrated Approach

The CIMP monitoring program integrates the five required primary monitoring elements and the objectives of the EWMP. Data collected during the receiving water monitoring program and the stormwater and non-stormwater outfall monitoring programs will be reviewed to understand the potential relationships between outfalls and receiving water impairments. Regional studies provide additional information to evaluate the condition of receiving waters. This information will be used to identify and prioritize the most effective compliance strategies as part of the EWMP.

The CIMP provides a framework to promote coordination between monitoring agencies for monitoring programs. In addition, the CIMP implements a multiple line of evidence approach. The information obtained from the receiving water monitoring program will be coordinated with outfall investigation and monitoring to identify potential sources and areas of concern. In addition, the type and extent of follow up monitoring and inspections will be based on initial inspection findings. The CIMP integrates and updates the plans for monitoring and investigation of TMDL pollutants, including bacterial indicators, nutrients, and trash.

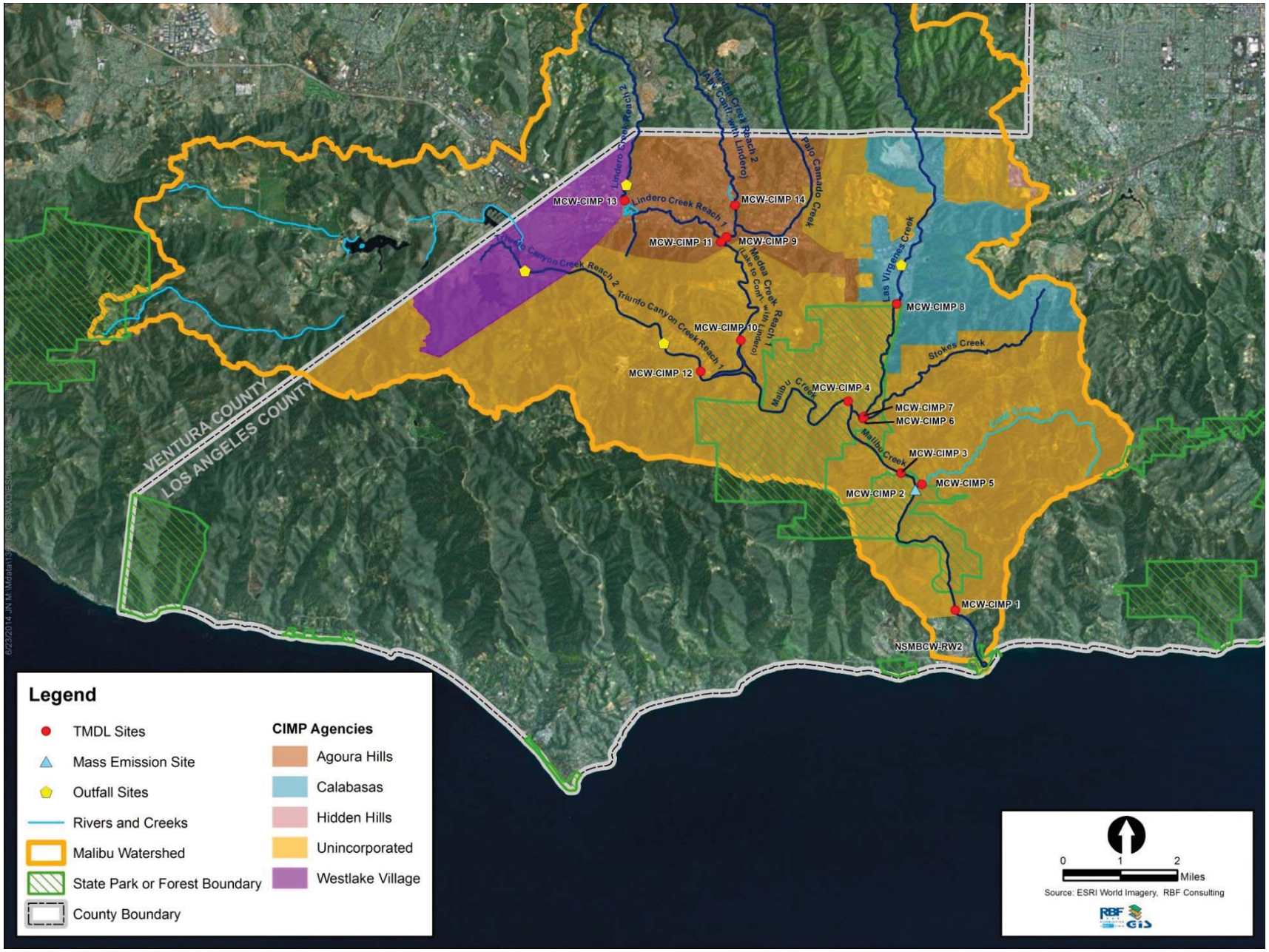
The monitoring program also collects information to be used in the EWMP to prioritize locations for implementation of BMPs where efforts will provide the most benefit to water quality in receiving waters. The EWMP is currently being developed, and it includes a water quality prioritization. The EWMP will specify the schedule for updates to the prioritization of water bodies for BMPs. The proposed monitoring sites are shown in Figure ES-1.

Receiving Water Monitoring Program

The receiving water monitoring program meets the requirements of the MS4 permit. The data will be used to characterize the runoff from subwatersheds draining to major reach segments within the Malibu watershed. Major reach segments are defined for this CIMP as reaches with TMDL WLAs, 303(d) listed impairments, or other receiving water limits (RWLs). Section VI of Attachment E of the MS4 permit includes requirements for the receiving water monitoring program. The permit requires that the Permittees conduct receiving water monitoring at:

1. TMDL receiving water compliance points, as designated in Regional Water Board Executive Officer approved TMDL Monitoring Plans,
2. Previously designated mass emission stations, and
3. Additional receiving water locations representative of the impacts from MS4 discharges.

Figure ES-1: Proposed CIMP Monitoring Sites



The receiving water quality monitoring information obtained through this program will be used to:

- assess compliance with water quality objectives (WQOs);
- calibrate and verify the Reasonable Assurance Analysis (RAA) model results for reach segments;
- evaluate the impact of BMPs, including source control, distributed and other structural BMPs, and programmatic efforts; and
- analyze spatial and temporal trends within the watershed to evaluate the impacts of compliance efforts.

Stormwater Outfall Monitoring

The CIMP includes a representative approach to characterize the stormwater discharge. The monitoring is intended to develop an understanding of the potential contributions from HUC-12 subwatersheds to receiving waters. One outfall per HUC-12 draining representative sources will be sampled under multiple stormwater events each year to characterize the discharge into the receiving waters. An analysis of the land use in each of the HUC-12 watersheds was performed to identify monitoring sites that are representative of the MS4 land use in each of the watersheds. Table ES -1 lists the locations, permittees, and geographic information about the stormwater outfall monitoring sites.

Table ES-1: Stormwater Outfall Monitoring Sites

HUC-12 Name (HUC-12 ID/ Total Outfall)	Permittee(s)	Monitoring Outfall ID (Latitude, Longitude)	Note
Potrero Valley Creek (180701040101/44)	Westlake Village	TRUNFOC-095A (34.132542, -118.8219063)	27 inch RCP; northeast of Triunfo Canyon Creek and Lindero Canyon Rd.
Medea Creek (180701040102/39)	Agoura Hills	LNDRC-074 (34.155, -118.7912)	48 inch RCP; northwest of Lindero Creek and Thousand Oaks Blvd.
Las Virgenes Creek (180701040103/46)	Calabasas	LAVCR-054 (34.134801, -118.706786)	102 inch RCP ; northeast of Lost Hills Rd and Cold Springs St.
Cold Creek-Malibu Creek (180701040104/8)	Unincorporated	TRUNFOC-035 (34.11445, -118.779199)	36 inch RCP; northwest side of the bridge at the intersection of Troutdale and Mulholland Hwy.

Non-Stormwater Outfall Monitoring Program

The non-stormwater outfall monitoring includes a tiered structure of investigation and monitoring to identify, investigate, and address potential sources of pollutants. Outfalls will be screened visually during dry weather conditions to identify locations with significant discharge. The outfalls will be prioritized based on the presence of discharge and the potential impact from the discharge (based on receiving water impairments and potential loading).

Follow up source investigations and efforts to eliminate dry weather flows will be initiated to identify potential sources for locations with high ambient concentrations of pollutants. These may include additional inspections, field measurements, collection of water or sediment samples for analysis, and source tracking.

Table ES-2: Receiving Water Monitoring Sites

Monitoring Site ID	MCW-CIMP 1	Mass Emission Station S-02	MCW-CIMP 3	MCW-CIMP 4	MCW-CIMP 5	MCW-CIMP 6	MCW-CIMP 7	MCW-CIMP 8	MCW-CIMP 9	MCW-CIMP 10	MCW-CIMP 11	MCW-CIMP 12	MCW-CIMP 13	MCW-CIMP 14
Existing Site ID	MCW-2	Mass Emission S-02	MCW-3 / CMS_MC_1	MCW-4	MCW-5	MCW-6	MCW-7	CMS LVC 3	MCW-10	MCW-11	MCW-13 / CMS_LDC_2	MCW-16	CMS_LDC_1	CMS_MDC_1
Subwatershed	Lower Malibu Creek	Malibu Creek	Middle Malibu Creek	Upper Malibu Creek	Cold Creek	Stokes Creek	Lower Las Virgenes Creek	Lower Las Virgenes Creek	Palo Comado Creek	Lower Medea Creek	Lower Lindero Creek	Triunfo (Lower)	Upper Lindero (Reach 2)	Upper Medea (Reach 2)
Constituent	Frequency													
Bacteria TMDL														
E. coli	Weekly	3/2	Weekly	Weekly	Weekly	Weekly	Weekly		Weekly	Weekly	Weekly	Weekly		
Trash TMDL														
Trash	Conducted per Malibu Creek TMRP													
Nutrient TMDL														
Total Phosphorus		3/2			3/2	3/2	3/2		3/2	3/2	3/2	3/2	3/2	
Total Nitrogen		3/2			3/2	3/2	3/2		3/2	3/2	3/2	3/2	3/2	
Nitrate as Nitrogen plus Nitrite as Nitrogen		3/2			3/2	3/2	3/2		3/2	3/2	3/2	3/2	3/2	
Benthic Community Impairment TMDL [1]														
Total Phosphorus		3/2					3/2			3/2	3/2	3/2		
Total Nitrogen		3/2					3/2			3/2	3/2	3/2		
TSS		3/2					3/2			3/2	3/2	3/2		
Turbidity		3/2					3/2			3/2	3/2	3/2		
Dissolved Oxygen		3/2					3/2			3/2	3/2	3/2		
Ammonia		3/2					3/2			3/2	3/2	3/2		
Chlorophyll *a*		3/2					3/2			3/2	3/2	3/2		
SMB DDTs and PCBs TMDL														
DDTs and PCBs		3/0[3]												
303(d)														
TSS and SSC		3 [3]					3 [3]			3 [3]		3 [3]/2 [4]		
Hardness		3/2 [5]					3 [5]			3 [5]		3 [5]/2 [4]		
Selenium		3/2					3/2			3/2	3/2			
Sulfates		3/2												
Lead / Mercury												3/2		
MS4 Receiving Water														
Flow, DO, pH [5], Conductivity, Temperature		3/2					3/2			3/2		3/2		
Aquatic Toxicity		2/1					2/1			2/1		2/1		
Constituents with MLs [2]		1/1					1/1			1/1		1/1		

Notes:

Where the frequency is noted with two numbers (i.e., 3/2), the first number is the number of wet weather monitoring events and the second is the number of dry weather monitoring events within a monitoring year (July 1 through June 30). For example, Aquatic Toxicity at MCW-CIMP 2 will be monitored during two wet weather events and one dry weather event.

[1] Some of the Benthic Community Impairment TMDL biological indices, SC-IBI, SC-O/E, Benthic Algal Coverage, will be assessed by the SMC bioassessment program, which will randomly select 4 sites in the Santa Monica Bay Watershed (see Section 7.2), . Total Phosphorus is included for both the Nutrient TMDL and the Benthic Community Impairment TMDL.

[2] During the first year of the monitoring program, the monitoring program includes analysis of the constituents with minimum levels (MLs) that are listed on Table E-2 of the MRP during the first significant storm and the critical dry event. These constituents are shown in Appendix I of this report. Subsequent years will include monitoring for pollutants tested above the ML.

[3] For the SMB DDTs and PCBs TMDL, DDT and PCBs will be monitored during wet weather; for the sedimentation/siltation 303(d) listing, TSS and SSC will be monitored during wet weather.

[4] For dry weather when metals are monitored, TSS and Hardness will be monitored.

[5] For 303(d) listing constituents, hardness and pH are required at receiving water monitoring sites during wet weather only; hardness and pH will be measured for wet and dry weather at Mass Emission Station S-02.

The first step of the non-stormwater outfall monitoring program is to inventory the MS4 outfalls. The inventory includes outfalls identified from data maintained by the CIMP MS4 Stakeholders within the Malibu Creek Watershed and focuses on outfalls that are 36 inches or greater and 12 inches or greater in industrial areas located within the four HUC-12 sub-watersheds of Malibu Creek. The outfalls that have been inventoried will be screened to identify outfalls with significant discharges during the next step of the program. Where significant discharge is observed, follow up investigations based on the type of discharge are performed to identify the frequency of discharge at the site. Significant discharge will be defined after evaluation of the screening data. Once the outfalls with significant non-stormwater discharges have been identified, the outfalls will be prioritized and scheduled for follow up inspections and investigations.

Regional Monitoring Program

The LACFCD will continue to participate in the Regional Watershed Monitoring Program (Biosassessment Program) being managed by the Southern California Stormwater Monitoring Coalition (SMC). The LACFCD will contribute necessary resources to implement the bioassessment monitoring requirement of the MS4 permit on behalf of all permittees in Los Angeles County during the current permit cycle. Initiated in 2008, the SMC's Regional Bioassessment Program is designed to run over a five-year cycle. Monitoring under the first cycle concluded in 2013, with reporting of findings and additional special studies planned to occur in 2014. SMC, including LACFCD, has developed the bioassessment monitoring program for the next five-year cycle, which is scheduled to run from 2015 to 2019.

New Development and Re-Development Tracking Requirements in the NPDES Permit

Participating agencies have developed mechanisms for tracking new development/re-development projects that have been conditioned for post-construction BMPs pursuant to MS4 Permit Part VI.D.7. Agencies also have developed mechanisms for tracking the effectiveness of these BMPs pursuant to MS4 Permit Attachment E.X.

Schedule

In accordance with the Permit, the CIMP was submitted to the Executive Officer of the Regional Water Board on June 30, 2014**.** Existing monitoring programs will continue to be conducted until this CIMP is approved. During the summer of 2015 dry weather screening of major outfalls commenced and will be completed per permit requirements. Implementation of new monitoring programs and modifications to existing monitoring programs will begin July 2015, or 90 days after the approval of the CIMP, whichever is later.

1 Introduction and Background

Malibu Creek Watershed (MCW) covers 109 square miles at the southwestern end of Los Angeles County and the southern end of Ventura County. It is the largest watershed to drain into the Santa Monica Bay. MCW geographically includes portions of unincorporated Los Angeles County and all or part of five cities: Westlake Village, Agoura Hills, Calabasas, Malibu, and Hidden Hills. Much of the MCW is open space under jurisdiction of the State and Santa Monica Mountains Conservancy. The Santa Monica Mountains National Recreation Area, including the Malibu Creek State Park, covers much of the watershed. Figure 1 shows the CIMP Agency Jurisdictions in Malibu Creek Watershed.

The MCW poses unique challenges due to the topography of the land with steep ravines and densely vegetated riparian corridors, which creates many dangerous and inaccessible areas that cannot be safely monitored and are not suitable for water quality BMP's. In addition, the Monterey/Modelo formation outcrops in the watershed are natural sources of sulfate, phosphate, metals, and selenium , and are believed to contribute to the MCW water quality impairments.

Water quality monitoring of the MCW has taken place since the early 1980s. The early work focused on bacteria and pathogens at and near the lagoon and beach. Starting in the mid to late 1990s, the focus expanded to include tributaries and the upper watershed and a broader range of constituents. The Los Angeles County Flood Control District has stormwater monitoring data dating back to the mid-1990s. LACFCD data is focused on water chemistry. Different agencies focus on different aspects such as dry weather monitoring, biological surveys, or habitat assessments. Monitoring has been, or is currently being, conducted by the LACFCD, Los Angeles County Department of Health Services, Las Virgenes Municipal Water District, Heal the Bay, City of Calabasas, City of Malibu, and Ventura County.

The MCW is subject to two different National Pollutant Discharge Elimination System (NPDES) MS4 Permits: the Ventura County MS4 Permit (Order No. R4-2009-0057) in the upper portion of the watershed and the Los Angeles County MS4 Permit (Order No. R4-2012-0175) in the lower part of the watershed, which is the subject of the MCW EWMP. Additionally, other entities within the watershed that could contribute pollutant loads, but are not part of the MCW EWMP Group, include State Parks, National Parks, and Caltrans who are subject to other MS4 Permits and other NPDES.

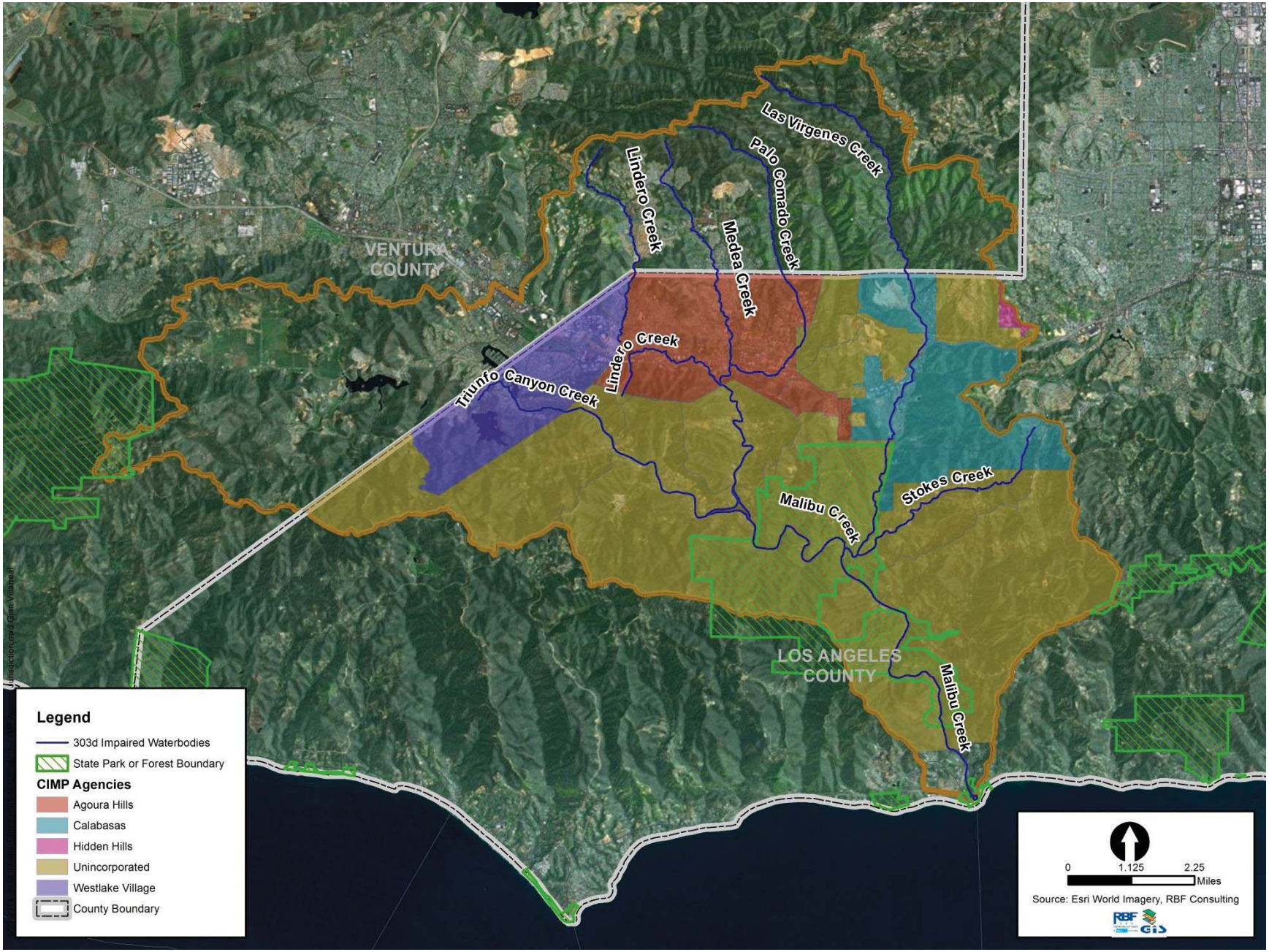
1.1 Objectives of the CIMP

This CIMP provides the approach and major elements of the monitoring plan for the CIMP MS4 Stakeholders within the Malibu Creek Watershed. The objectives of the surface water monitoring program are to:

- Assess the chemical, physical, and biological impacts of discharges from the MS4 on receiving waters.
- Assess compliance with receiving water limitations (RWLs) and water quality-based effluent limitations (WQBELs) established to implement TMDL wet weather and dry weather waste load allocations (WLAs).
- Characterize pollutant loads in MS4 discharges.
- Identify sources of pollutants in MS4 discharges.
- Measure the effectiveness of pollutant controls implemented under the MS4 Permit.

The proposed CIMP elements were developed with a focus on meeting these objectives. Although, all of the objectives listed above are interrelated, the receiving water monitoring program was developed primarily to provide data to support the first, second, and fifth objectives. The outfall monitoring program was developed to support the third, fourth, and fifth objectives. The new and re-development effectiveness tracking program provides additional support for the fifth objective listed above. To estimate pollutant loads, the information obtained through this CIMP will be evaluated in collaboration with the Reasonable Assurance Analysis (RAA) model for the EWMP.

Figure 1: CIMP Agency Jurisdictions in Malibu Creek Watershed



1.2 The Malibu Creek Watershed

The Malibu Creek Watershed is located in Los Angeles and Ventura Counties in Southern California. The watershed covers 109 square miles from the Santa Monica Mountains to Santa Monica Bay. The Malibu Creek Watershed includes several streams and lakes that flow in primarily south and southeast directions into Malibu Creek and toward Malibu Lagoon and the Pacific Coast.

Several tributaries and lakes in the watershed have TMDLs and are identified on the 303(d) list for water quality impairments of beneficial uses. TMDLs in the Malibu Creek Watershed have been developed for bacterial indicators, trash, nutrients, and impacts to benthic communities. In addition, Santa Monica Bay has several TMDLs, including bacteria, trash (debris), DDTs, and PCBs. The Santa Monica Bay TMDLs for bacteria and trash integrate the TMDL allocations (waste load allocations (WLAs), load allocations, and margin of safety) from the Malibu Creek TMDL. Therefore, compliance with the Santa Monica Bay TMDLs for jurisdictions in the Malibu Creek Watershed is based on the Malibu Creek TMDL allocations.

The geography, topography, and geology of the watershed present several challenges. The geographical challenge is that the watershed is subject to two different NPDES MS4 Permits, the Ventura County MS4 Permit (Order No. R4-2009-0057) in the upper portion of the watershed and the Los Angeles County MS4 Permit (Order No. R4-2012-0175) in the lower part of the watershed, which is the subject of the MCW EWMP. This geography poses potential challenges for the lower portion of the watershed and the MCW EWMP, with the potential for discharge of pollutants from the upper portion of the watershed to the lower portion of the watershed. Additionally, other entities in the watershed, including State Parks, National Parks, and Caltrans, are subject to other MS4 Permits and other NPDES requirements, which may complicate collaboration for implementation. The topography presents challenges in that the watershed contains a significant amount of steep gradient terrain in the watershed. The geology presents challenges from the Monterey/Modelo formation outcrops in the watershed that are known to have elevated levels of sulfate, phosphate, metals, and selenium. There are also known natural springs in the watershed that have the potential to emanate from the Monterey/Modelo formation, which may be a natural source of pollutants and could have impacts on water quality. There are also several dams on Malibu Creek in the watershed, which act as sinks for sediment and pollutants.

The Malibu Creek Watershed poses significant challenges for monitoring activities. The watershed has topography that limits safe access, such as steep ravines and densely vegetated riparian corridors. In addition, sensitive habitat and private property requires that permission be granted and other precautions be used to access certain areas.

1.3 Schedule for Monitoring Program Submittals

The MS4 permit (Attachment E, Section IV, C) requires that each Permittee that is developing a CIMP [1] comply with the following schedule:

- By June 28, 2013 (six months after the effective date of the approval of the MS4 permit, December 28, 2012), each Permittee shall submit a letter of intent to the Executive Officer of the Regional Water Board describing whether it intends to follow a CIMP approach for each of the required monitoring plan elements.
- Permittees electing to develop an EWMP shall submit a CIMP plan to the Executive Officer of the Regional Water Board by June 30, 2014.

[1] Permittees not electing to develop a CIMP have other requirements that are outlined in the MS4 permit.

- Beginning summer of 2014, the dry weather screening of major outfalls will commence. Implementation of new monitoring programs and modifications to existing monitoring programs will be implemented beginning July 2015 or 90 days after the approval of the CIMP, whichever is later.
- Monitoring requirements pursuant to Order No. 01-182 and MRP CI 6948, and pursuant to approved TMDL monitoring plans identified in Attachment E, Table E-1 of the permit (the approved plans are discussed in Section 2.1 of this CIMP), shall remain in effect until the Executive Officer of the Regional Water Board approves the Permittee(s) CIMP plan(s).

2 Monitoring Requirements

The CIMP monitoring program includes five primary monitoring components:

1. **Receiving water monitoring** – performed at:
    a. Previously designated Mass Emission Stations,
    b. TMDL receiving water compliance points, and
    c. Receiving water locations representative of the impacts from MS4 discharges.
2. **Stormwater outfall monitoring** – Outfall monitoring is performed at locations representative of the land uses within the Permittee's jurisdiction (located within each HUC-12 watershed).
3. **Non-Stormwater outfall monitoring** – Initial screening of outfalls is conducted to identify significant non-stormwater flows. Additional monitoring is performed at outfalls with significant non-stormwater discharges that remain unaddressed after source identification.
4. **New Development/Re-development effectiveness tracking** – The program tracks whether the conditions in the building permit issued by the Permittee are implemented, and it ensures that the volume of stormwater associated with the design storm is retained on-site (as required by Part VI.D.7.c.i. of the Permit).
5. **Regional studies** – to further characterize the impact of the MS4 discharges on the beneficial uses of the receiving waters.

This CIMP includes all of these monitoring elements. The primary elements include TMDL monitoring requirements specified in approved TMDL Monitoring Plans (see Table E-1). The CIMP also includes modifications to improve the effectiveness of the program to align with the EWMP and provide information to the CIMP MS4 Stakeholders.

2.1 TMDL Monitoring Requirements

The Permit states that the CIMP must consider TMDL monitoring plans that have been developed and approved by the Executive Officer of the LARWQCB. Two TMDL monitoring plans have been developed for the Malibu Creek Watershed:

- The Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan – The final plan was submitted to the LARWQCB on February 25, 2008 and approved on April 8, 2008.
- The Malibu Creek Watershed Trash Monitoring and Reporting Plan (TMRP) – The final plan was submitted to the LARWQCB on April 28, 2010 and approved on May 30, 2014.

The U.S. Environmental Protection Agency (USEPA) has developed three TMDLs to address impairments in the Malibu Creek Watershed: the Malibu Creek Nutrient TMDL, TMDLs for Los Angeles Area Lakes [2], and the Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments. The USEPA TMDLs do not have implementation plans with monitoring requirements, and monitoring plans have not been developed for either TMDL. The CIMP includes monitoring for the USEPA developed TMDLs within Malibu Creek.

TMDLs were developed by the LARWQCB for bacteria and trash in Santa Monica Bay. These TMDLs also include loads from Malibu Creek for bacterial indicators and trash based on the Malibu Creek TMDLs. One monitoring plan has been developed for the bacteria TMDLs in Santa Monica Bay, the Santa Monica Bay Beaches Bacterial (SMBBB) TMDLs Coordinated Shoreline Monitoring Plan (April 7, 2004). The USEPA also developed TMDLs for DDTs and PCBs in Santa Monica Bay.

2.1.1 Malibu Creek and Lagoon Bacteria TMDL

The Malibu Creek and Lagoon Bacteria TMDL (Bacteria TMDL) went into effect on January 24, 2006. The TMDL addresses bacterial indicator densities in Malibu Creek impacting the water contact recreation (REC-1) beneficial use of the creek, lagoon, and adjacent beach. The TMDL includes WLAs for point sources of discharge, including the MS4 system. Compliance with the TMDL is based on the number of allowable exceedances of single sample objectives and by meeting the geometric mean targets.

The Malibu Creek Bacteria TMDL was updated in a reconsideration amendment adopted June 7, 2012 by the Regional Water Quality Control Board (Resolution No. R12-009). The State Board approved the reconsideration amendment on March 19, 2013, the California Office of Administrative Law (OAL) approved the revisions on November 8, 2013 and was effective upon USEPA approval on July 2, 2014. The reconsideration amendment includes revisions to some of the TMDL requirements, including a requirement to develop an outfall monitoring program.

The Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan was established by the County of Los Angeles, in coordination with the County of Ventura, the Cities of Agoura Hills, Calabasas, Hidden Hills, Malibu, Thousand Oaks, and Westlake Village, and the California Department of Transportation, with feedback from the LARWQCB, Heal the Bay, and Santa Monica Bay Keeper. Implementation of the monitoring program was accomplished through a coordinated effort by the responsible agencies for that plan.

The Monitoring Plan was originally submitted to the LARWQCB on May 24, 2006. The plan was approved by the LARWQCB on September 11, 2007. On April 8, 2008, the LARWQCB approved a modification to the plan to clarify changes in the overall monitoring responsibilities and other issues.

Numeric targets established in the Bacteria TMDL include geometric mean and single sample limits for marine water and fresh water. The Basin Plan Amendment (BPA) states that if a site is out of compliance, the LARWQCB may require daily monitoring or initiation of an investigation until single sample events meet water quality objectives.

The BPA for the Bacteria TMDL identified seven monitoring sites and required a minimum of one site in each subwatershed. The Bacteria TMDL Monitoring Plan identifies 18 receiving water monitoring sites, as shown in Table 1.

[2] The USEPA developed TMDLs for Los Angeles Area Lakes include a TMDL for Mercury in Lake Sherwood. However, the lake is located within Ventura County and not included in this CIMP. Westlake Lake was 303(d) listed as impaired due to lead and is discussed in the USEPA report; however, it is currently achieving numeric targets and was not assigned a TMDL.

Table 1: List of Existing Receiving Water Monitoring Sites for Bacteria TMDL Monitoring Program

Responsible Agencies	Site ID	Subwatershed	Coordinates
County of Los Angeles, Cities of Agoura Hills**, Calabasas, Hidden Hills, Malibu, and Westlake Village, and Caltrans	MCW-1*	Malibu Lagoon	N 34°02.069' W 118°40.969'
	MCW-2*	Lower Malibu Creek	N 34°02.825 W 118°41.371'
	MCW-3*	Middle Malibu Creek	N 34°04.654' W 118°42.105'
	MCW-4*	Upper Malibu Creek	N 34°06.001' W 118°43.364'
	MCW-5	Cold Creek	N 34°04.739' W 118°41.996'
	MCW-6	Stokes Creek	N 34°05.889' W 118°42.748'
	MCW-7*	Lower Las Virgenes Creek	N 34°05.769' W 118°43.072'
	MCW-10	Palo Comado Creek	N 34°08.585' W 118°45.468'
	MCW-11*	Lower Medea Creek	N 34°06.921' W 118°45.339'
	MCW-13	Lower Lindero Creek	N 34°08.592' W 118°45.842'
	MCW-16*	Triunfo Creek	N 34°06.438' W 118°46.073'
County of Ventura** and the City of Thousand Oaks	MCW-8b	Upper Las Virgenes	N 34°10.115' W 118°42.102'
	MCW-9	Cheeseboro Creek	N 34°09'05.0" W 118°44'03.6"
	MCW-12	Upper Medea Creek	N 34°10.230' W 118°45.765'
	MCW-14b	Upper Lindero Creek	N 34°09.943' W 118°47.268'
	MCW-15b	Westlake	N 34°09.263' W 118°48.693'
	MCW-17	Potrero Canyon	N 34°08.696' W 118°50.165'
	MCW-18	Hidden Valley	N 34°08.474' W 118°52.673'

Source: Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan (Los Angeles County, 2007). These are all existing monitoring sites and are included in the CIMP within the receiving water monitoring program.

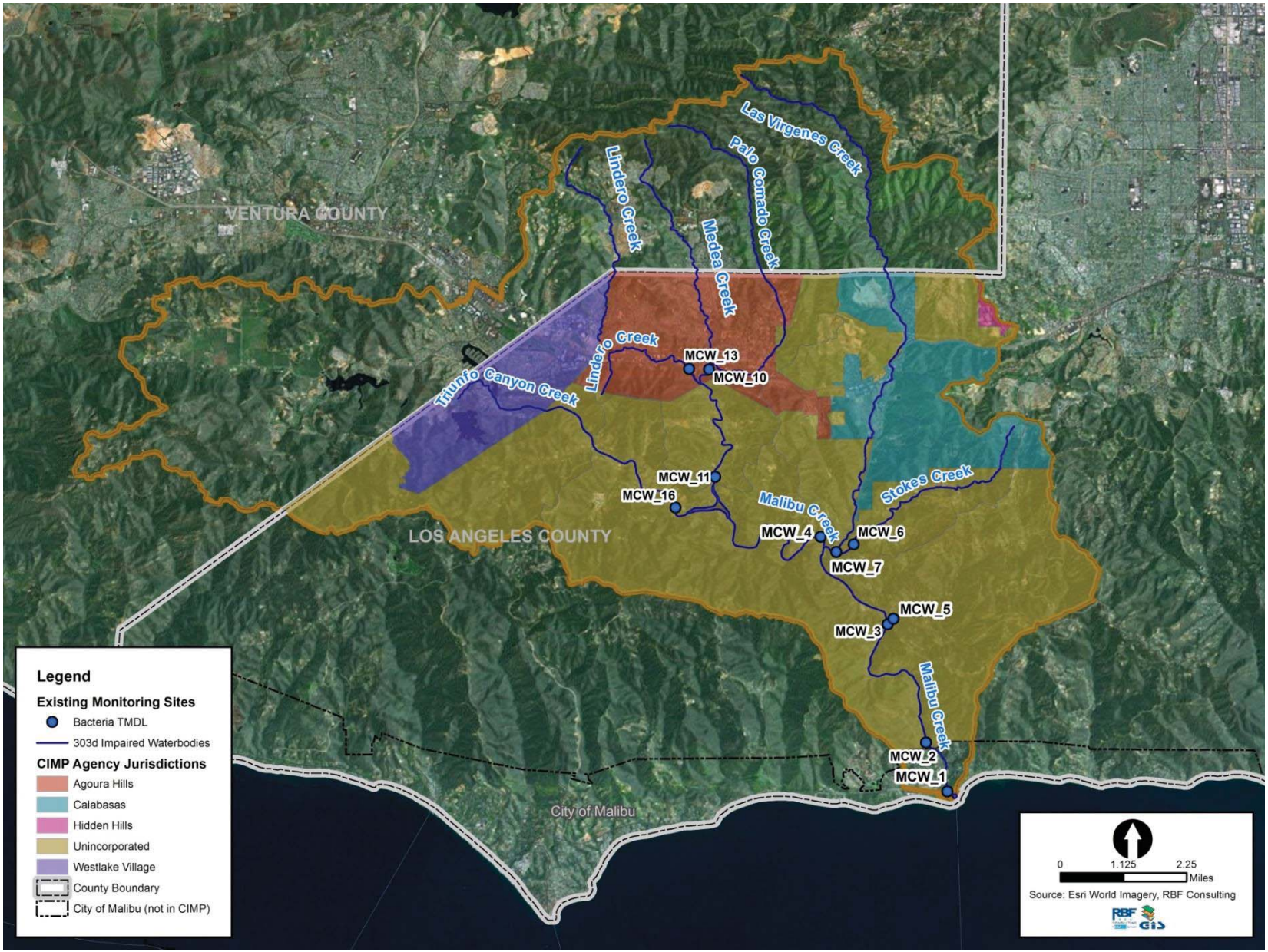
*Sampling Stations pursuant to LARWQCB Resolution 2004-19R (R12-009), Malibu Creek and Lagoon Bacteria TMDL Table 7-10.2

**Agency responsible for contracting or providing services

Eleven sites fall within the jurisdiction of County of Los Angeles, Cities of Agoura Hills, Calabasas, Hidden Hills, Malibu and Westlake Village. Seven of the sites were specified within Table 7-10.2 of Resolution No. R12-009 of the TMDL (as noted in the table); the other eleven sites identified in the Bacteria TMDL monitoring plan were based on areas where frequent REC-1 use is known to occur, availability of previous water quality data, perennial flow, and safe and legal access. The locations of the monitoring sites identified in the Bacteria TMDL monitoring plan are shown in Figure 2.

The Malibu Creek Bacteria TMDL Monitoring Plan agencies collect samples on a weekly basis. Following the identification of an exceedance, the monitoring plan specifies that follow up monitoring be performed during the first three years of the summer dry-weather period and the first six years of the winter dry-weather period.

Figure 2: Existing Bacteria TMDL Monitoring Sites



2.1.2 Malibu Creek Watershed Trash Monitoring and Reporting Plan (TMRP)

The Malibu Creek Trash TMDL went into effect on July 7, 2009. In addition to requirements to meet trash load reduction milestones, the TMDL required the stakeholders to develop and submit a trash monitoring and reporting plan (TMRP). The TMRP describes the methodologies to assess and monitor trash in the impaired subwatersheds of the Malibu Creek Watershed. The TMRP was required to include plans to assess and quantify the amounts of trash collected, the frequency, location, and reporting of monitoring, a metric to measure trash, and a prioritization of areas with the highest trash generation rates. In addition, the TMRP is required to include an evaluation of the effectiveness of the minimum frequency of assessment and collection (MFAC) and BMP programs.

The Malibu Creek Watershed TMRP was submitted by the Cities of Calabasas, Malibu, Westlake Village, Agoura Hills, and Hidden Hills, and the County of Los Angeles to the LARWQCB on April 28, 2010, and was approved on May 30, 2014.

The TMRP establishes two types of monitoring sites to meet the MFAC and TMRP requirements:

- Compliance Monitoring Sites (CMS); and
- General Assessment Sites (GAS).

The CMS are specific locations within impaired water bodies within the watershed chosen to be representative of the defined reach described in the Basin Plan Amendment for the TMDL. The CMS locations are shown in Figure 3. Information on the location and proposed monitoring frequency is presented in Table 2. The frequencies included in the TMRP were modified from the TMDL to allow the responsible agencies to accurately and adequately assess the impacts of trash in the watershed. The trash monitoring program is discussed in Section 4.2.2. The trash monitoring sites proposed will serve to fulfill trash TMDL monitoring requirements including the development of the trash baseline allocation and identification of sources via the detailed collection taking place at the site.

Figure 3: TMRP Compliance Monitoring Sites

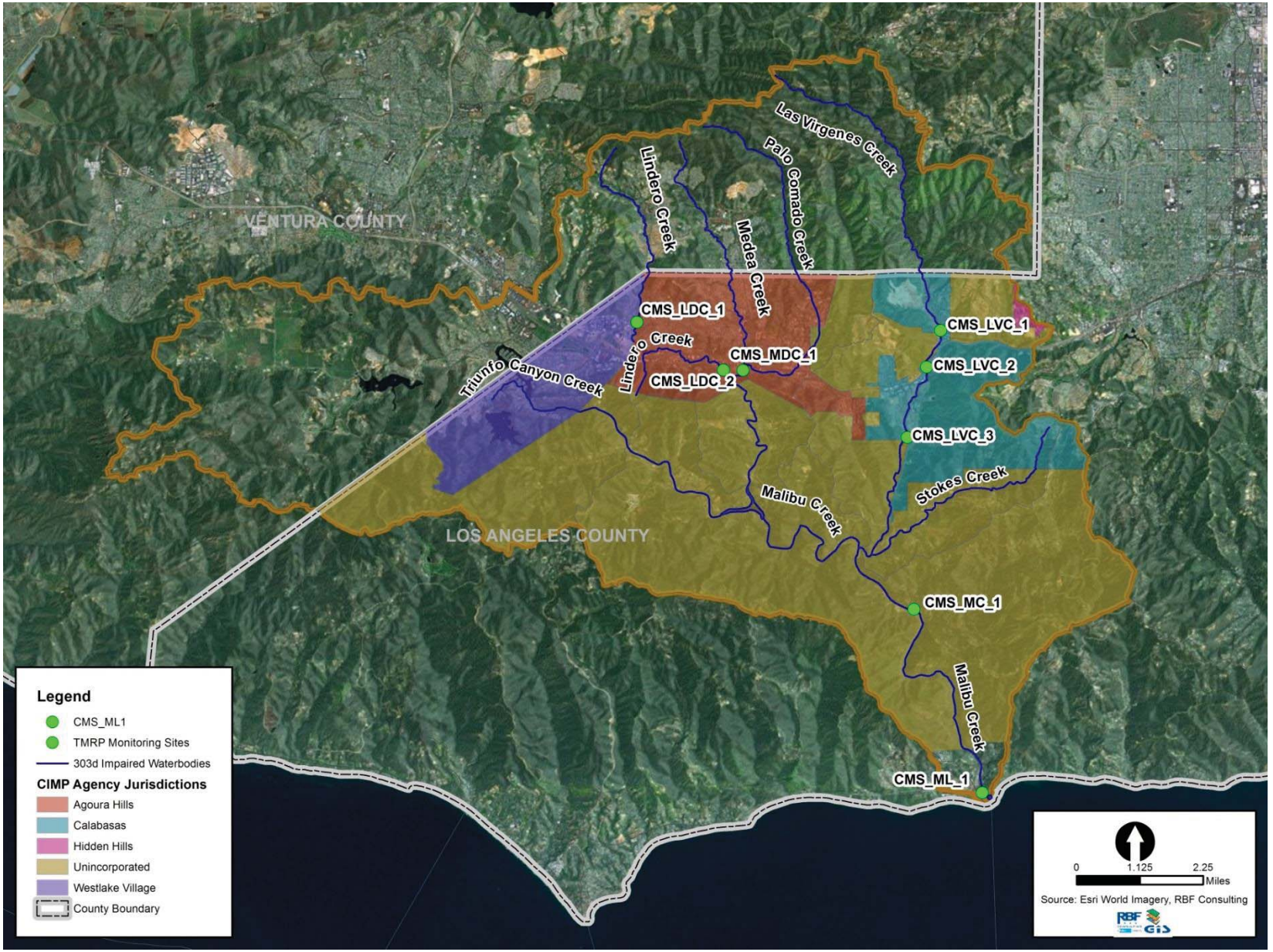


Table 2: TMRP Compliance Monitoring Site Descriptions

Site Number	Subwatershed	Frequency	Location
CMS ML 1	Malibu Lagoon	Bimonthly	Just upstream of the Pacific Coast Highway (PCH) crossing, on the left bank upstream from the bridge.
CMS MC 1	Malibu Creek	Monthly	On the west bank immediately upstream of the Malibu Creek Canyon Road crossing and downstream of the Tapia WWTP facility (34° 4'54.19"N; 118°42'15.88"W). Just upstream of MCW 3 and Mass Emission Station S02.
CMS LVC 1	Las Virgenes Creek	Bimonthly	In the concrete flood control channel, upstream of the Parkmor Road crossing (34° 9'13.55"N; 118°41'48.11"W).
CMS LVC 2	Las Virgenes Creek	Bimonthly	In the restored stream channel, just upstream of the Rondell Street crossing and downstream of the Hwy 101 freeway crossing (34° 8'39.59"N; 118°42'3.57"W).
CMS LVC 3	Las Virgenes Creek	Bimonthly	In the concrete channel just downstream of the Lost Hills Road crossing (34° 7'33.91"N; 118°42'24.64"W). Adjacent to an old MCWMP site, LV2.
CMS MDC 1	Medea Creek	Bimonthly	In the concrete channel upstream of the confluence with Cheeseboro Creek and just downstream of the Agoura Road crossing (34° 8'35.31"N; 118°45'28.71"W). This site is near site MCW 10 (located on Palo Comado Creek).
CMS LDC 1	Lindero Creek	Monthly	In the concrete channel just upstream of the Thousand Oaks Boulevard crossing and just downstream of the golf facility driving range (34° 9'19.21"N; 118°47'27.56"W). Adjacent to an old MCWMP site, LIN1.
CMS LDC 2	Lindero Creek	Bimonthly	In the engineered channel just downstream of the Agoura Road crossing (34° 8'35.36"N; 118°45'50.51"W). This site is adjacent to site MCW 13.

The GAS were intended to identify high trash generating areas upstream of CMS locations, site specific BMP effectiveness monitoring, site specific conditions before BMP implementation (both full and partial capture systems), specific land use characterization, and other applications as deemed necessary by the participating responsible parties. The GAS were intended to gather additional data on high trash generating areas impacting CMS, to potentially identify sources of trash, characterize land use trash generation, and also to verify the effectiveness of BMPs. These were not considered points of compliance for TMDL milestones and reductions. The GAS were designed to change over time as necessary to gather information about different areas of interest. No specific GAS locations were identified in the TMRP, but the TMRP did define a process to identify these.

The outfall monitoring locations include an assessment of trash immediately downstream of the outfall and are discussed in Sections 4 and 5.

The assessment method chosen in the TMRP is a modified version of the Rapid Trash Assessment Protocol (RTAP), California Regional Water Quality Control Board, San Francisco Bay Region, November 15, 2004 (developed by members of the San Francisco Bay LARWQCB's Surface Water Ambient Monitoring Program [SWAMP]) combined with elements from the Oxnard City Corps Storm Drain Keeper Program. The RTAP was modified for the goals of this TMRP and MFAC program. The modifications include the addition of several metrics to allow a variety of options for defining the baseline and a removal of the "scoring" portion of the RTAP. The additional metrics to be assessed include the number of trash bags, weight of trash collected, and total trash collection time per site.

2.1.3 TMDL for Nutrients in the Malibu Creek Watershed (USEPA)

The USEPA TMDL for nutrients in the Malibu Creek Watershed was approved on March 21, 2003. The TMDL does not include an implementation plan with monitoring requirements and a schedule to comply with the TMDL. However, it does include recommendations for monitoring. In addition, the Permit requires that the time schedule to achieve the final numeric WLAs must not exceed five years from the effective date of the Permit. This CIMP includes monitoring for nutrients and nutrient-related effects within Las Virgenes Creek, Lindero Creek, Medea Creek, and Malibu Creek. The USEPA report recommends that monitoring be conducted for:

- Dissolved oxygen
- Ammonia,
- Nitrate,
- Total nitrogen,
- Percent algal cover, and
- Chlorophyll *a*.

2.1.4 Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients (USEPA)

The USEPA developed the Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments. The draft TMDL was released in December 2012 and was approved by the USEPA on July 2, 2013. The TMDL includes numeric targets and WLAs for sediment and nutrients in Malibu Creek and Lagoon but does not include an implementation plan with monitoring requirements and a schedule to comply with the TMDL. Tributaries not separated from Malibu Creek by a lake or reservoir are assigned WLAs, including Stokes Creek, Cold Creek, and Las Virgenes Creek. The numeric targets that apply to Malibu Creek and those tributaries are assessed using:

- California Stream Condition Index (CSCI), which combines scores from the California O/E and the California pMMI;
- California O/E Ratio (O/E), where O is the number of taxa observed in a sample and E is the expected number of taxa;
- California predictive Multi-Metric Index (pMMI) – Southern California Index of Biological Integrity (SC-IBI);
- Benthic Algal Coverage;
- Dissolved Oxygen;
- Natural Sedimentation Rate (Total Suspended Solids or TSS, Turbidity); and
- Nutrient Concentrations (TN, TP).

The numeric targets for the TMDL for Malibu Lagoon are:

- Benthic community diversity,
- Dissolved oxygen, and
- Nutrient concentrations (TN, TP).

2.1.5 Santa Monica Bay Bacteria TMDLs

On January 24, 2002 and December 12, 2002, the LARWQCB adopted the dry weather and wet weather TMDL for bacteria at Santa Monica Bay Beaches, respectively. Both TMDLs for bacterial indicators at Santa Monica Bay Beaches, became effective on July 15, 2003.

The Santa Monica Bay watershed is separated into several jurisdictions, one of which includes Malibu Creek. The municipalities within Malibu Creek Watershed are assigned WLAs within the Malibu Creek Bacteria TMDL.

Los Angeles County, Agoura Hills, Calabasas, West Lake Village, and Hidden Hills all contributed to the Santa Monica Bay Beaches Bacterial TMDLs Coordinated Shoreline Monitoring Program along with Ventura County, Thousand Oaks, City of Malibu, Caltrans, Simi Valley and California Department of Parks and Recreation. In the past, monitoring was conducted at SMB-MC-1 (Malibu Point on Malibu State Beach), SMB-MC-2 (Breach Point of Malibu Lagoon), and SMB-MC-3 (Malibu Pier on Carbon Beach). The City of Los Angeles, Department of Public Works Bureau of Sanitation, Environmental Monitoring Division (EMD) and the Los Angeles County Department of Health Services (LACDHS) performed sample collection and analysis for these sites.

2.1.6 TMDL for Debris in the Near and Offshore Santa Monica Bay

The Santa Monica Bay Debris TMDL was adopted by the LARWQCB on November 4, 2010 and it became effective on March 20, 2012. Los Angeles County, Agoura Hills, Calabasas, and Westlake Village are assigned WLAs for debris in the TMDL, along with other agencies. Hidden Hills is assigned WLAs for the Malibu Creek Trash TMDL, but not in the SMB Debris TMDL. Compliance with associated trash TMDL requirements for the Malibu Creek Watershed is achieved through the Malibu Creek Trash TMDL. Jurisdictions and agencies within Malibu Creek are required to prepare a plan to address plastic pellets in the watershed.

Under the Santa Monica Bay TMDL for Debris in the Near and Offshore TMDL, jurisdictions identified as responsible parties for point sources of trash in the existing Malibu Creek Trash TMDL shall either prepare a Plastic Pellet Monitoring and Reporting Plan (PMRP) or demonstrate that a PMRP is not required under certain circumstances.

The Malibu Creek CIMP Stakeholders reviewed facilities Standard Industrial Classification (SIC) codes where available and conducted facility surveys where not available within their watersheds (West Lake Village) to determine if any have industrial facilities or activities related to the manufacturing, handling, or transportation of plastic pellets. Currently facilities and activities within the jurisdiction of the stakeholders within the Malibu Creek Watershed are not included in this category. As a result, monitoring for plastic pellets is not required in the watershed; however, the stakeholders, where appropriate have developed Plastic Pellet Spill Response Plans. Los Angeles County has prepared a PMRP for the unincorporated areas within the Santa Monica Bay watershed including Malibu Creek. The PMRP was submitted to the RWQCB on September 20, 2013. The stakeholders will continue to review facilities within their jurisdictions to identify initiation of activities related to the manufacturing, handling, or transportation of plastic pellets. The Cities of Agoura Hills & Westlake Village have submitted their Plastic Pellet Spill Response Plans. The Cities of Calabasas and Hidden Hills do not have plastic pellet manufacturers in their jurisdictions.

2.1.7 Santa Monica Bay TMDL for DDTs and PCBs

The Santa Monica Bay TMDL for DDTs and PCBs was developed by the USEPA and approved on March 26, 2012. The MS4 Permit includes WLAs for DDTs and PCBs for the bay expressed as a total annual load of pollutants from sediment discharged to the bay. The permit requires that stakeholders comply with the WLAs based on a three-year averaging period. The TMDL has recommendations for stormwater monitoring and establishes waste load allocations for stormwater discharge. The Malibu Creek CIMP stakeholders will conduct monitoring for DDT and PCBs at the Mass Emission Station. Three stormwater

samples will be collected, filtered for sediment, and tested for DDT and PCBs using the high resolution methods as recommended in the TMDL.

2.2 303(d) Listings

The permit also requires that the Permittees monitor constituents included in the 303(d) list for surface water bodies within the watershed. The latest approved 303(d) list is the 2010 list. The impairments included in the 2010 list are shown in Table 3. Some of the impairments have been incorporated into TMDLs since the 2010 list was released, and these are identified in the supporting notes to Table 3. The State Water Resources Control Board is reviewing data submitted for an update to the 303(d) list, but the 303(d) list will not be updated until 2016.

Table 3: 2010 303(d) Listings in the Malibu Creek Watershed

Water Body Name	Pollutant	TMDL Development Status	Method to Address Impairment
Lake Lindero	Algae	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Lake Lindero	Chloride	No TMDL	Not under EWMP/CIMP Stakeholders' Authority
Lake Lindero	Eutrophic	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Lake Lindero	Odor	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Lake Lindero	Selenium	No TMDL	Not under EWMP/CIMP Stakeholders' Authority
Lake Lindero	Specific Conductivity	No TMDL	Not under EWMP/CIMP Stakeholders' Authority
Lake Lindero	Trash	Malibu Creek Trash TMDL[2]	Not under EWMP/CIMP Stakeholders' Authority
Lake Sherwood	Algae	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Lake Sherwood	Ammonia	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Lake Sherwood	Eutrophic	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Lake Sherwood	Mercury (tissue)	No TMDL	Not under EWMP/CIMP Stakeholders' Authority
Lake Sherwood	Organic Enrichment/Low Dissolved Oxygen	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Las Virgenes Creek	Benthic-Macroinvertebrate Bioassessments	Malibu Creek and Lagoon TMDLs for Sedimentation and Nutrients to Address Benthic Community Impairments[1]	Addressed in EWMP/CIMP
Las Virgenes Creek	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Las Virgenes Creek	Invasive Species	No TMDL	Addressed in EWMP/CIMP
Las Virgenes Creek	Nutrients (Algae)	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Las Virgenes Creek	Organic Enrichment/Low Dissolved Oxygen	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Las Virgenes Creek	Scum/Foam-unnatural	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Las Virgenes Creek	Sedimentation/Siltation	Malibu Creek and Lagoon TMDLs for Sedimentation and Nutrients to Address Benthic Community Impairments[1]	Addressed in EWMP/CIMP
Las Virgenes Creek	Selenium	No TMDL	Addressed in EWMP/CIMP
Las Virgenes Creek	Trash	Malibu Creek Trash TMDL[2]	Addressed in EWMP/CIMP

Water Body Name	Pollutant	TMDL Development Status	Method to Address Impairment
Lindero Creek Reach 1	Algae	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Lindero Creek Reach 1	Benthic-Macroinvertebrate Bioassessments	No TMDL	Addressed in EWMP/CIMP
Lindero Creek Reach 1	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Lindero Creek Reach 1	Invasive Species	No TMDL	Addressed in EWMP/CIMP
Lindero Creek Reach 1	Scum/Foam-unnatural	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Lindero Creek Reach 1	Selenium	No TMDL	Addressed in EWMP/CIMP
Lindero Creek Reach 1	Trash	Malibu Creek Trash TMDL[2]	Addressed in EWMP/CIMP
Lindero Creek Reach 2 (Above Lake)	Algae	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Lindero Creek Reach 2 (Above Lake)	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Lindero Creek Reach 2 (Above Lake)	Scum/Foam-unnatural	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Lindero Creek Reach 2 (Above Lake)	Selenium	No TMDL	Addressed in EWMP/CIMP
Lindero Creek Reach 2 (Above Lake)	Trash	Malibu Creek Trash TMDL[2]	Addressed in EWMP/CIMP
Malibou Lake	Algae	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Malibou Lake	Eutrophic	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Malibou Lake	Organic Enrichment/Low Dissolved Oxygen	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Malibu Beach	DDT (Dichlorodiphenyltrichloroethane)	Santa Monica Bay TMDLs for DDTs and PCBs[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Addressed in EWMP/CIMP
Malibu Beach	Indicator Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Malibu Creek	Benthic-Macroinvertebrate Bioassessments	Malibu Creek and Lagoon TMDLs for Sedimentation and Nutrients to Address Benthic Community Impairments[1]	Addressed in EWMP/CIMP
Malibu Creek	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Malibu Creek	Fish Barriers (Fish Passage)	No TMDL	Addressed in EWMP/CIMP
Malibu Creek	Invasive Species	No TMDL	Addressed in EWMP/CIMP
Malibu Creek	Nutrients (Algae)	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Malibu Creek	Scum/Foam-unnatural	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP

Water Body Name	Pollutant	TMDL Development Status	Method to Address Impairment
Malibu Creek	Sedimentation/Siltation	Malibu Creek and Lagoon TMDLs for Sedimentation and Nutrients to Address Benthic Community Impairments[1]	Addressed in EWMP/CIMP
Malibu Creek	Selenium	No TMDL	Addressed in EWMP/CIMP
Malibu Creek	Sulfates	No TMDL	Addressed in EWMP/CIMP
Malibu Creek	Trash	Malibu Creek Trash TMDL[2]	Addressed in EWMP/CIMP
Malibu Lagoon	Benthic Community Effects	Malibu Creek and Lagoon TMDLs for Sedimentation and Nutrients to Address Benthic Community Impairments[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Malibu Lagoon	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Malibu Lagoon	Eutrophic	Malibu Creek Nutrient TMDL[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Malibu Lagoon	Swimming Restrictions	Malibu Creek Bacteria TMDL[2]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Malibu Lagoon	Viruses (enteric)	Malibu Creek Bacteria TMDL[2]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Malibu Lagoon	pH	No TMDL	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP

Water Body Name	Pollutant	TMDL Development Status	Method to Address Impairment
Malibu Lagoon Beach (Surfrider)	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Malibu Lagoon Beach (Surfrider)	DDT (Dichlorodiphenyltrichloroethane)	Santa Monica Bay TMDLs for DDTs and PCBs[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Malibu Lagoon Beach (Surfrider)	PCBs (Polychlorinated biphenyls)	Santa Monica Bay TMDLs for DDTs and PCBs[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Medea Creek Reach 1 (Lake to Confl. with Lindero)	Algae	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Medea Creek Reach 1 (Lake to Confl. with Lindero)	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Medea Creek Reach 1 (Lake to Confl. with Lindero)	Sedimentation/Siltation	No TMDL	Addressed in EWMP/CIMP
Medea Creek Reach 1 (Lake to Confl. with Lindero)	Selenium	No TMDL	Addressed in EWMP/CIMP
Medea Creek Reach 1 (Lake to Confl. with Lindero)	Trash	Malibu Creek Trash TMDL[2]	Addressed in EWMP/CIMP
Medea Creek Reach 2 (Abv Confl. with Lindero)	Algae	Malibu Creek Nutrient TMDL[1]	Addressed in EWMP/CIMP
Medea Creek Reach 2 (Abv Confl. with Lindero)	Benthic-Macroinvertebrate Bioassessments	No TMDL	Addressed in EWMP/CIMP
Medea Creek Reach 2 (Abv Confl. with Lindero)	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Medea Creek Reach 2 (Abv Confl. with Lindero)	Invasive Species	No TMDL	Addressed in EWMP/CIMP

Water Body Name	Pollutant	TMDL Development Status	Method to Address Impairment
Medea Creek Reach 2 (Abv Confl. with Lindero)	Sedimentation/Siltation	No TMDL	Addressed in EWMP/CIMP
Medea Creek Reach 2 (Abv Confl. with Lindero)	Selenium	No TMDL	Addressed in EWMP/CIMP
Medea Creek Reach 2 (Abv Confl. with Lindero)	Trash	Malibu Creek Trash TMDL[2]	Addressed in EWMP/CIMP
Palo Comado Creek	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Santa Monica Bay Offshore/Nearshore	DDT (tissue & sediment)	Santa Monica Bay TMDLs for DDTs and PCBs[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Santa Monica Bay Offshore/Nearshore	Debris	Santa Monica Bay Debris TMDL[2]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Santa Monica Bay Offshore/Nearshore	Fish Consumption Advisory	Santa Monica Bay TMDLs for DDTs and PCBs[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Santa Monica Bay Offshore/Nearshore	PCBs (Polychlorinated biphenyls) (tissue & sediment)	Santa Monica Bay TMDLs for DDTs and PCBs[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Santa Monica Bay Offshore/Nearshore	Sediment Toxicity	Santa Monica Bay TMDLs for DDTs and PCBs[1]	Outside of Region covered by the Malibu Creek EWMP/CIMP; Pollutant loads from stakeholders jurisdiction to be addressed in EWMP/CIMP
Stokes Creek	Coliform Bacteria	Malibu Creek Bacteria TMDL[2]	Addressed in EWMP/CIMP
Triunfo Canyon Creek Reach 1	Lead	No TMDL	Addressed in EWMP/CIMP
Triunfo Canyon Creek Reach 1	Mercury	No TMDL	Addressed in EWMP/CIMP
Triunfo Canyon Creek Reach 1	Sedimentation/Siltation	No TMDL	Addressed in EWMP/CIMP

Water Body Name	Pollutant	TMDL Development Status	Method to Address Impairment
Triunfo Canyon Creek Reach 2	Benthic-Macroinvertebrate Bioassessments	No TMDL	Addressed in EWMP/CIMP
Triunfo Canyon Creek Reach 2	Lead	No TMDL	Addressed in EWMP/CIMP
Triunfo Canyon Creek Reach 2	Mercury	No TMDL	Addressed in EWMP/CIMP
Triunfo Canyon Creek Reach 2	Sedimentation/Siltation	No TMDL	Addressed in EWMP/CIMP
Westlake Lake	Algae	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Westlake Lake	Ammonia	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Westlake Lake	Eutrophic	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Westlake Lake	Lead	Los Angeles Area Lakes Nitrogen, Phosphorus, Mercury, Trash, Organochlorine Pesticides and PCBs TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority
Westlake Lake	Organic Enrichment/Low Dissolved Oxygen	Malibu Creek Nutrient TMDL[1]	Not under EWMP/CIMP Stakeholders' Authority

Notes:

[1] TMDL developed by the USEPA

[2] TMDL developed by the LARWQCB

In some of the watersheds, natural sources likely cause or contribute to these stressors (LARWQCB, 2012). According to an assessment conducted by the LVMWD/TSDJPA (LVMWD/TSDJPA, 2012) in 2010-2011, the Monterey/Modelo Formation outcrops in the watershed are known to have elevated levels of sulfate, phosphate, metals, and selenium. The study found that the high background levels of biostimulatory substances associated with the formation likely have a negative impact on benthic communities downstream.

2.3 Previous Monitoring Programs

Numerous monitoring programs have been conducted in the Malibu Creek Watershed. Several of these are implemented by agencies participating in this CIMP. This monitoring plan considered opportunities to coordinate with other stakeholders where coordination would provide mutual benefit.

Figure 4 shows locations of monitoring sites for the monitoring programs that have been implemented in the watershed and were considered during development of the plan. Table 4 includes additional information about the sites. Several, but not all, of the programs are ongoing as shown in Table 4. Many of these programs were implemented by agencies participating in the CIMP. Monitoring for the bacteria TMDL, mass emission monitoring, and other monitoring required by the permit are included in this CIMP.

Figure 4: CIMP Agency Existing Monitoring Sites

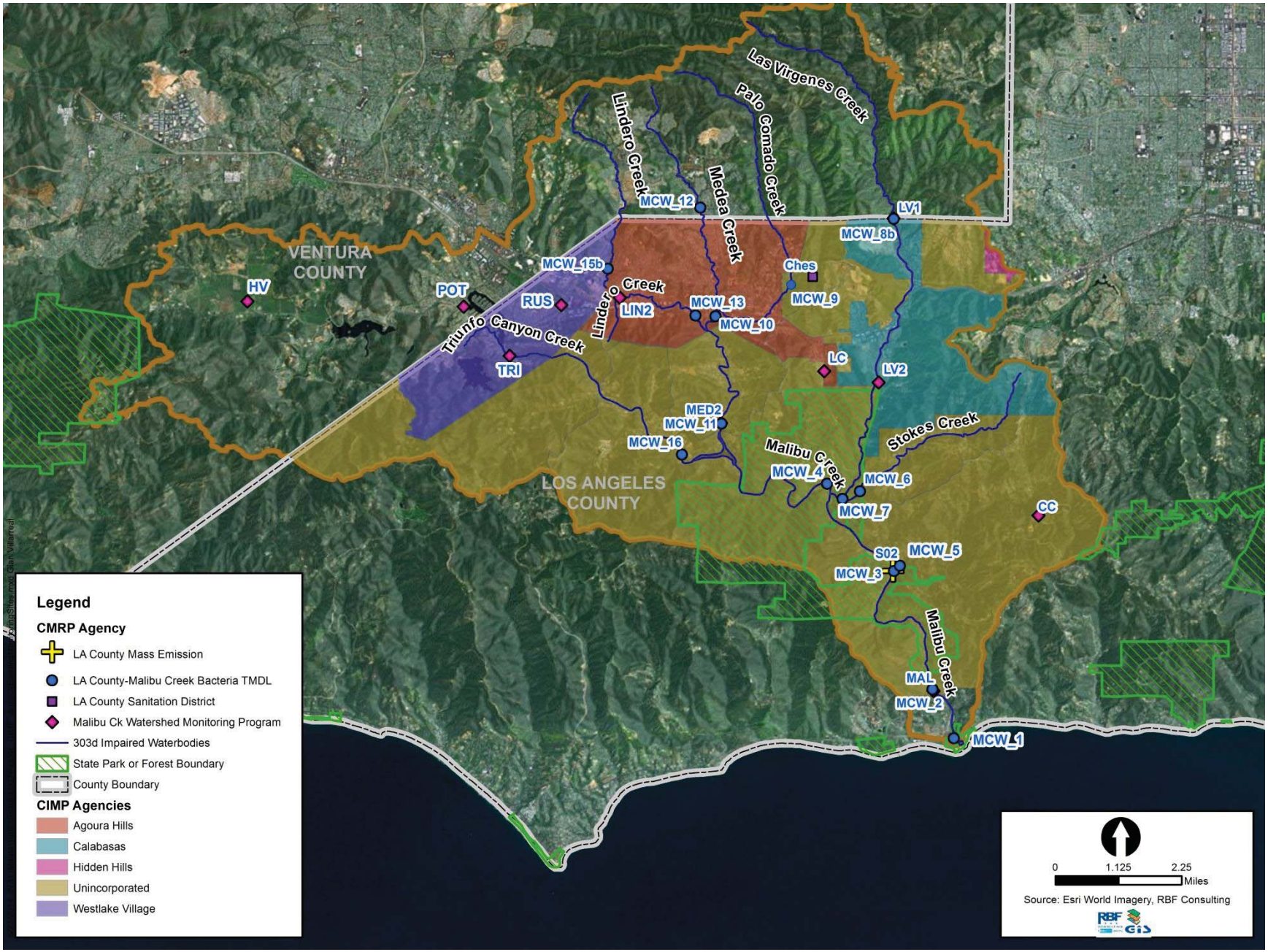


Table 4: Existing Monitoring Programs in the Malibu Creek Watershed

Monitoring Program	Collection Agency	Location of Samples	Year(s) Data Collected
Benthic Macroinvertebrate Bioassessment (SMC)	Los Angeles County	Las Virgenes/ Malibu Creek/ Cold Creek/Triunfo	2003-2011
Tapia WRF NPDES Permit MRP – Bioassessment Monitoring	Las Virgenes MWD/ Triunfo Sanitation District Joint Powers Authority (TSD JPA)	Malibu Creek/ Malibu Lagoon/ Las Virgenes Creek	2006-2013
BMI	Southern California Coastal Water Research Project	Miscellaneous	2009
Heal the Bay Stream Team	Heal the Bay	Multiple/Variable	1998-2010
Tapia WRF NPDES Permit MRP – Receiving Water Monitoring	Las Virgenes Municipal/TSD JPA	Malibu Creek, Malibu Lagoon, Las Virgenes Creek	1971-2013
Bacteria TMDL Monitoring Program	Los Angeles County Department of Public Works/Agoura Hills	Malibu Creek	2009- 2013
Los Angeles County Sanitation District	Los Angeles County Sanitation District	Malibu Creek WS/ Cheeseboro Creek	1999-2009
LARWQCB TMDL Monitoring	LARWQCB	Malibu Creek/ Las Virgenes Creek	2013 [2]
Mass Emission MS4 Monitoring[1]	Los Angeles County Flood Control District	MS4 Mass Emission Station S-02	1995-to date
Malibu Creek Watershed Monitoring Program	City of Calabasas, Agoura Hills, Westlake Village, and Malibu, and County of Los Angeles, and LVMWD/TSD JPA	Malibu Creek Watershed	2005-2007
Microbial Source Tracking	Los Angeles County Flood Control/ Los Angeles County Public Works	Malibu Creek Watershed	2013-2015 [3]
National Park Service (NPS) MEDN Monitoring Program	Santa Monica Mountains National Recreation Area (SMM-NRA)	Malibu Creek Watershed	2006-2011
Tributary Monitoring	Los Angeles County Flood Control District	Malibu Creek Watershed	2011-2013
Malibu Lagoon Bacteria and Nutrient Study	United States Geological Survey	Malibu Creek, Malibu Lagoon, wells, and ocean	2009-2010
Ventura Co Bacteria TMDL Monitoring Program	Ventura County	Ventura County	2008-2013

Notes:

N/A – Not available

[1] One mass emission station is located in Malibu Creek Watershed.

[2] Correspondence with LARWQCB (August 13, 2013).

[3] Anticipated monitoring period for the study.

3 CIMP Monitoring Approach

The CIMP includes five monitoring elements that are coordinated with the EWMP to provide an understanding of water quality in the watershed, the impacts of MS4 discharges, and the benefits of BMP implementation. These five elements are:

1. Receiving water monitoring;
2. Stormwater outfall based monitoring;
3. Non-stormwater outfall based monitoring;
4. New Development/Re-development effectiveness tracking
5. Regional studies.

Existing monitoring will continue to be conducted and beginning summer of 2014, the dry weather screening of major outfalls will commence. Implementation of new monitoring programs and modifications to existing monitoring programs will begin July 2015, or 90 days after the approval of the CIMP, whichever is later.

Data collected during these monitoring efforts will be reviewed annually to understand relationships between MS4 discharges and will be used to:

- Assess the impacts of discharges from the MS4 on receiving waters,
- Assess compliance with Total Maximum Daily Load (TMDL) dry and wet weather WLAs, receiving water limitations (RWLs) and water quality based effluent limitations (WQBELs),
- Characterize pollutant loads from MS4 discharges,
- Identify sources of pollutants in the watershed,
- Characterize the effectiveness of source controls and other BMPs,
- Assess point source loads for the Reasonable Assurance Analysis (RAA) model, and
- Validate the assumptions for receiving waters in the RAA water quality model.

The CIMP provides a framework to promote coordination between monitoring agencies for monitoring programs. A unified monitoring and analysis program will promote efficiency and consensus. The information obtained from the receiving water monitoring program is coordinated with outfall investigation and monitoring to identify potential sources and areas of concern. Receiving water monitoring and outfall monitoring data will also be used to calibrate and validate the EWMP water quality model.

As part of the EWMP, a data analysis to determine water quality priorities for the watershed has been conducted based on the prioritization methodology defined in the MS4 permit. The water quality prioritization evaluates waterbody-pollutant combinations based on TMDL impairments, 303(d) listed impairments, and other exceedances of receiving water limits. While the water quality priorities analysis will be finalized as part of the EWMP development, an initial characterization of the water quality priorities has been developed. The water quality priorities analysis is used in the CIMP to define the parameters that will be monitored at each site. Since the analysis is reach specific, different parameters will be monitored at different monitoring locations. The initial analysis used to develop the parameters to be monitored at each site is shown in Table 5.

Table 5: Water Body Prioritization from the Malibu Creek Watershed EWMP

Reach		Cheeseboro Creek	Cold Creek (tributary to Malibu Creek)	Las Virgenes Creek	Liberty Canyon Creek	Lindero Creek Reach 1	Lindero Creek Reach 2	Malibu Creek	Medea Creek Reach 1	Medea Creek Reach 2	Palo Comado Creek	Stokes Creek	Triunfo Canyon Creek Reach 1	Triunfo Canyon Creek Reach 2
TMDLs - Category 1 - Highest Priority with Past Due TMDL Milestones														
Bacterial Indicator TMDLs	E. coli (dry)			X		X	X	X	X	X	X	X		
Trash	Trash			X		X	X	X	X	X				
TMDLs - Category 1 - Highest Priority without Past Due TMDL Milestones														
Bacterial Indicator TMDLs	E. coli (wet)			X		X	X	X	X	X	X	X		
Nutrients/ Nutrient Related	Total Nitrogen	X	X	X		X	X	X	X	X	X	X	X	X
	Total Phosphorus	X	X	X		X	X	X	X	X	X	X	X	X
	Nitrate as Nitrogen plus Nitrite as Nitrogen	X	X	X		X	X	X	X	X	X	X	X	X
Benthic Community Impairments (TMDL)	Sedimentation		X	X				X				X		
	Total Nitrogen		X	X				X				X		
	Total Phosphorus		X	X				X				X		
	TSS		X	X				X				X		
	Turbidity		X	X				X				X		
	Dissolved Oxygen		X	X				X				X		
	Ammonia		X	X				X				X		
	Chlorophyll *a*		X	X				X				X		
303(d) - Category 2 - High Priority														
303(d) listed impairments	Benthic - Macroinvert Assessments					X				X				X
	Sedimentation/ Siltation								X	X			X	X
	Fish Barriers (Fish Passage) [1]							X						
	Invasive species [2]			X		X				X				
	Selenium [2]			X		X	X	X	X	X				
	Sulfates							X						
	Lead												X	X
	Mercu1ry												X	X

Reach		Cheeseboro Creek	Cold Creek (tributary to Malibu Creek)	Las Virgenes Creek	Liberty Canyon Creek	Lindero Creek Reach 1	Lindero Creek Reach 2	Malibu Creek	Medea Creek Reach 1	Medea Creek Reach 2	Palo Comado Creek	Stokes Creek	Triunfo Canyon Creek Reach 1	Triunfo Canyon Creek Reach 2
Water Quality Objective Exceedances - Category 3 - Medium Priority														
Water Quality Objective Exceedances	Chloride	X												
	Phosphate as P	X			X									
	Specific Conductivity	X		X	X		X		X	X				
	Sulfate	X		X	X					X				
	TDS	X		X	X									
	E. coli				X									

Notes:

[1] 303(d) listed impairment not based on pollutant
[2] 303(d) listed impairment may not be the result of MS4 discharge (invasive species and selenium)

3.1 Monitoring Site Selection

The CIMP includes receiving water monitoring sites, outfall monitoring locations for stormwater and non-stormwater, and regional studies. Monitoring sites were chosen with consideration of safety, accessibility, and representativeness of the impaired reaches. Field reconnaissance was performed at new sites to make sure that they meet the safety and accessibility requirements for CIMP monitoring.

The CIMP MS4 Stakeholders are coordinating with Ventura County, Las Virgenes Municipal Water District, North Santa Monica Bay Coastal Watersheds EWMP Group, State Parks and other agencies within the Malibu watershed to consolidate monitoring and reduce redundancy between different monitoring programs within the Malibu Creek Watershed.

Dry weather outfall monitoring sites will be identified through the screening of outfalls which is expected to occur in late 2014. Under this program, the CIMP MS4 Stakeholders will conduct an inventory of the MS4 outfalls within their jurisdictions in the Malibu Creek Watershed and identify outfalls with significant sources of dry weather/non-stormwater discharge. Follow up monitoring will be performed at sites with significant discharge as defined after completion of the dry weather/non-stormwater outfall screening program.

The Malibu Creek Bacteria TMDL amendment (Resolution No. R12-009, Attachment A) required that the responsible jurisdictions and agencies submit an outfall monitoring plan within six months of the effective date (July 2, 2014) which includes:

- an adequate number of representative outfalls to be sampled;
- a sampling frequency; and
- protocol for enhanced outfall monitoring as a result of an in-stream exceedance.

The CIMP addresses these requirements by incorporating stormwater and non-stormwater outfall monitoring programs. No specific outfall monitoring sites are identified in the Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan (or for trash in the TMRP). However, this CIMP pairs outfall monitoring sites with receiving water monitoring sites.

Site details are provided for each of the monitoring elements in following sections. Existing monitoring sites were obtained from the responsible agencies and evaluated for suitability in meeting permit monitoring requirements. Existing sites were preferred due to accessibility, safe access, and a record of monitoring data exists that can be augmented to help define trends. If an existing location met the monitoring requirements (as is discussed below), the existing location was incorporated into the CIMP. If existing monitoring locations were not feasible, a desktop evaluation was performed to identify potential new locations for a monitoring site. The site evaluation included opportunities to consolidate monitoring and reduce redundancy between monitoring programs.

Field surveys were conducted at sites identified during the desktop analysis. The site access was evaluated, and information was collected on the route to access the site to determine whether there were safety concerns. Factors considered include steep slopes, safe locations from which to collect samples at the waterbody or outfall, and any limits on legal access. Notes and photographs were collected during the field surveys.

3.2 Sampling and Lab Methodology

All monitoring activities are conducted in accordance with the Standard Provisions for Monitoring described in Attachment D of the MS4 Permit and in 40 CFR Section 122.41(j)(1). Grab samples will be

collected at all receiving water monitoring sites[3] other than at Mass Emission Station S-02. Automatic samplers will be implemented to collect samples at the stormwater outfall monitoring locations. The appropriate equipment will be used to collect samples, and field collection procedures will be performed as required by the Surface Water Ambient Monitoring Program (SWAMP). Laboratory analysis will be performed by accredited labs as shown in Appendix B, where accreditation is available for constituents of interest. Additional information about the methodology, Standard Operating Procedures (SOPs), and quality assurance/quality control (QA/QC) are provided in Appendix B, or they will be available through the contractor conducting the analysis and sample collection. The SOPs and QA/QC were adapted from practices implemented by the County of Los Angeles and the California Department of Transportation (Caltrans).

Field personnel are fully trained to use proper sample and data collection methods as detailed in the SWAMP requirements and in compliance with the QA/QC protocols. Field personnel will have the appropriate safety training, review the CIMP methodology and protocols, and carry copies of the standard operating procedures (SOPs) during field activities. All personnel will take appropriate precautions to ensure safety and not place themselves, or others, at risk of harm to conduct monitoring activities. Field personnel will not attempt to perform monitoring activities at any location that cannot be accessed safely or where right of entry cannot be obtained. In addition, field personnel take precautions to minimize any site or wildlife disturbances.

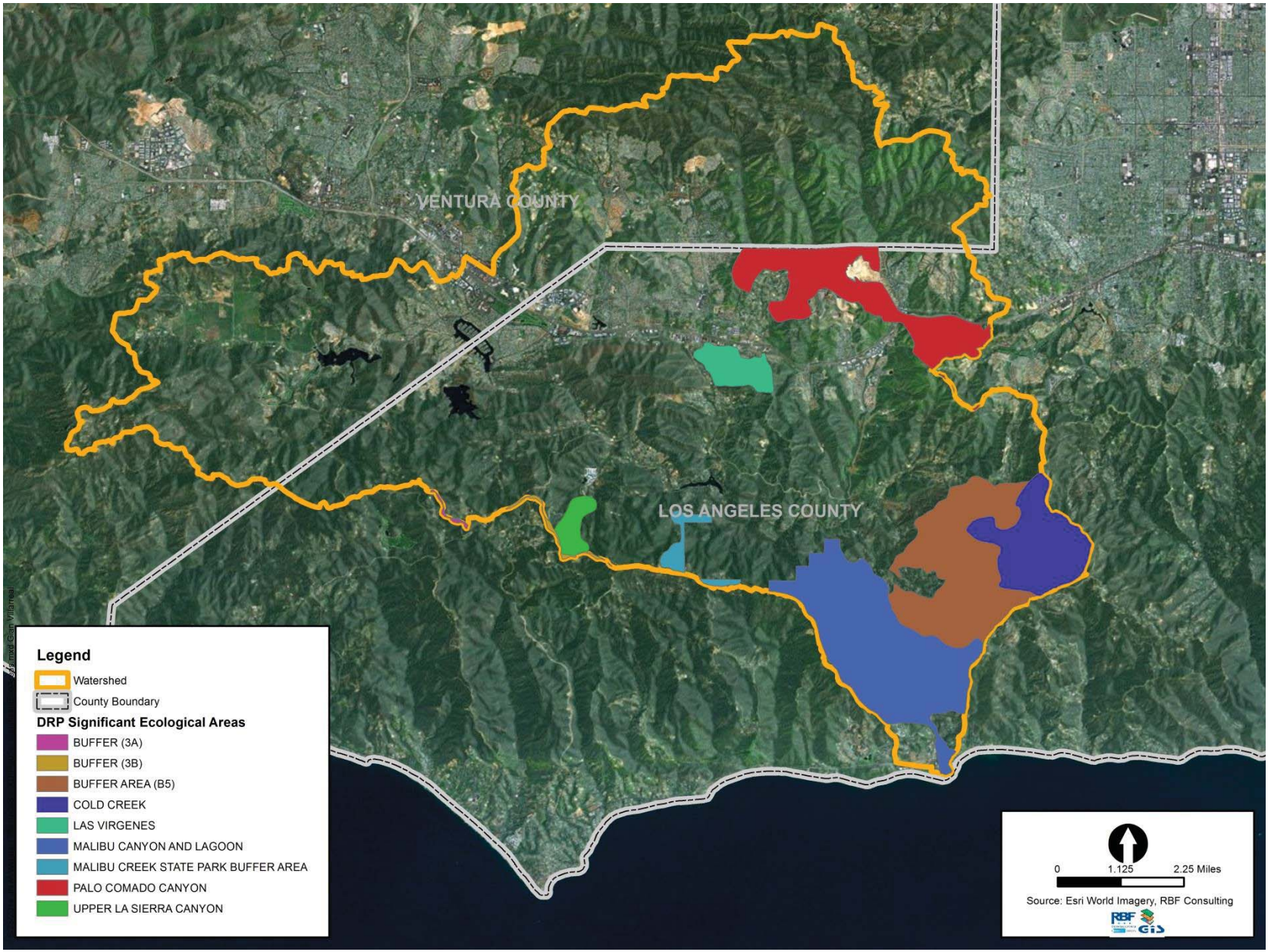
The Malibu Creek Watershed includes a large portion of areas considered to be significant ecological areas (SEA) within the Santa Monica Mountains. These areas are "determined to possess an example of biotic resources that cumulatively represent biological diversity for protecting biotic diversity, as part of the Los Angeles County general plan or the City general plan" (Los Angeles County, 2013). A map of the SEAs in the watershed is provided in Figure 5.

Data records are maintained as specified in 40 CFR Section 122.41(j)(1) for field and laboratory activities. Field notes are maintained during all field activities. These notes detail the weather conditions on the day of sample collection, the exact location and time of sample collection and sample ID, site conditions, the presence of trash or wildlife, odors, water characteristics (color, clarity), approximate flow levels. All samples will be properly labeled with the sample ID, collection date and time, site ID, and the name of the sample collector.

Lab records are maintained for a period of at least five years, including records of calibration and maintenance of equipment, copies of all reports, and records of data. The retained information also includes the analytical method, date, exact location and time of analysis and measurements, individual performing the measurements, and the results.

[3] Where the potential is identified, monitoring procedures could be modified in the future to include use of automated flow measurement and sampling equipment in lieu of manual sampling. In such case, a written notification will be submitted to the Executive Officer of the Regional Water Board prior to installation of the sampling equipment.

Figure 5: Significant Ecological Areas in the Malibu Creek Watershed



3.3 Reporting

Annual reports are submitted by the Permittees by December 15 of each year. The annual reports include the data collected during monitoring activities. The annual reports will cover the monitoring period of July 1 through June 30. Additionally, the MRP specifies semi-annual, electronic submittal of receiving water and outfall monitoring data to losangeles@waterboards.ca.gov in California Environmental Data Exchange Network (CEDEN) format. To fulfill this requirement, the monitoring year will be split as shown in Table 6.

Table 6. Receiving Water and Outfall Monitoring Electronic Data Submittal Schedule

Monitoring Period	Data Submittal
July 1 through December 31	By June 15 of the following year
January 1 through June 30	By December 15, included with the Annual Monitoring Report

As specified in Section XVIII of the Permit, the Annual reports include all data and strategies collected, control measures, and the assessments conducted by the Permittees within the Malibu Creek Watershed. The reports will include:

a. An Integrated Monitoring Compliance Report that summarizes any exceedances of:
   i. Outfall-based stormwater monitoring data,
   ii. Wet weather receiving water monitoring data,
   iii. Dry weather receiving water data, and
   iv. Non-stormwater outfall monitoring data.

   The report describes efforts to mitigate and/or eliminate non-stormwater discharges, or address stormwater discharges that exceed water quality based effluent limitations, non-stormwater action levels, or caused or contributed to aquatic toxicity;

b. Assessment of the stormwater control measure data collected under this CIMP, including the New Development and Re-development Projects;
c. Assessment of non-stormwater control measure data collected under this CIMP; and
d. Supporting data and information.

4 Receiving Water Monitoring

Receiving water monitoring is conducted during wet and dry weather at sampling sites on the main stem of Malibu Creek and each of the tributaries to characterize levels of pollutants in each of these subwatersheds. The permit requires that the Permittees conduct receiving water monitoring at:

- Mass Emission Stations previously designated;
- TMDL Receiving Water Monitoring Sites based on locations designated in Regional Water Board Executive Officer approved TMDL Monitoring Plans; and
- Receiving water monitoring sites representative of the impacts from MS4 discharges.

The objectives of the receiving water monitoring are to:

- Determine whether the receiving water limitations are being achieved;
- Assess trends in pollutant concentrations over time, or during specified conditions; and
- Determine whether the designated beneficial uses are fully supported as determined by water chemistry, as well as aquatic toxicity and bioassessment monitoring.

To achieve the objectives of the CIMP and EWMP, receiving water monitoring locations were identified at the downstream ends of major reach segments. These locations include the impacts from upstream MS4 discharges and enable estimates of pollutant loads from the upstream drainage area, and thus analysis of compliance with TMDL WLAs. Furthermore, the receiving water monitoring site for each upstream segment provides estimates of the upstream loads, so that the specific load for each subwatershed can be estimated.

The site locations have been coordinated with the water quality model used in the EWMP RAA. The model outputs are located at outlets of subwatersheds. Therefore, receiving water monitoring sites near the downstream at subwatersheds provide data for calibration and validation of model results. The calibrated and validated water quality model provides an estimation of water quality at other locations of interest with higher confidence.

The location of the receiving water sites is consistent with the pollutant prioritization. After reviewing the pollutant prioritization table, potential locations for receiving water monitoring sites were identified through a desktop analysis. The desktop analysis started at the downstream end of reach segment and moved upstream through the watershed along the reach to identify potential locations with access to the stream. Where existing monitoring sites were identified in close proximity to the subwatershed outlet, these were selected for field verification.

Three lakes within the Malibu Creek Watershed are assigned WLAs for TMDLs or included in the 303(d) list for water quality impairments, Westlake Lake, Lake Lindero, and Malibou Lake. These are privately owned lakes and monitoring at these lakes is not included as part of this CIMP.

4.1 Receiving Water Monitoring Sites

Fourteen receiving water monitoring sites will be monitored under this CIMP. The constituents monitored and sample collection frequency varies for the sites. Each site is designated for specific types of monitoring. The monitoring at each site is based on the impairments for each reach and the purpose of monitoring at the site (e.g., mass emission, TMDL, 303(d) listing, etc.). At least one site on each TMDL or 303(d) impaired reach within the jurisdiction of the CIMP MS4 Stakeholders will be monitored for those constituents. Several of the reaches adjacent to the boundary with Ventura County, will be monitored by Ventura County and are thus not included in this CIMP. Sites designated in the trash and bacteria TMDL monitoring plans are included in the CIMP, so that for several reaches, there may be more than one site at which monitoring data will be collected. Aquatic toxicity and other general MS4 constituents (these are defined later in this section) will be monitored at three receiving water monitoring sites representing major subwatersheds. Field measurements will be collected at receiving water monitoring sites.

Two of the sites designated in the bacteria TMDL monitoring plan were re-located in this CIMP. Site MCW-CIMP 9 is located approximately 1,000 feet downstream of site MCW-10. MCW-CIMP 11 was moved 1,500 feet downstream of MCW-13. The sites are more representative of Palo Comado Creek and Lower Lindero Creek. The sites more closely match the conditions of the streams; whereas, the sites identified in the bacteria TMDL monitoring plan were located where the streams daylight from underground box culverts. In addition, resuspension of bed sediments was identified as a potential concern at the previous monitoring site locations.

A brief summary of each of the receiving water monitoring sites is provided in Table 7. Descriptions and additional information about the locations of each of the sites is provided in Appendix A. A detailed discussion of the monitoring constituents and frequencies is provided in Table 11. The table includes the reach location, the Site ID of existing monitoring programs at that location, and purpose of monitoring

at each site. In addition, the table includes the agency responsible for existing monitoring activities at each site and additional notes.

Table 7: Selected Receiving Water Monitoring Sites

Proposed Site ID	Existing Site ID	Reach	Agency Currently Conducting Monitoring	Sample Collection Type	Impairment/ Monitoring Requirement	Notes on Site
MCW-CIMP 1	MCW-2 [1]	Lower Malibu Creek	CMP	Grab	TMDL	Assigned compliance requirements in the Bacteria TMDL
MASS EMISSION STATION S-02	Mass Emission S-02	Malibu Creek	LACFCD	Automatic Sampler	Mass Emission Station, TMDL, 303(d)	Previously designated mass emission station.
MCW-CIMP 3	CMS_MC_1	Middle Malibu Creek	City of Agoura Hills / County of Los Angeles	Grab / Observation and collection	TMDL	Assigned compliance requirements in the Bacteria TMDL; Designated as CMS_MC_1 in the Trash TMDL monitoring plan.
MCW-CIMP 4	MCW-4	Upper Malibu Creek	CMP	Grab	TMDL	Assigned compliance requirements in the Bacteria TMDL.
MCW-CIMP 5	MCW-5	Cold Creek	CMP	Grab	TMDL	Designated in the Bacteria TMDL monitoring plan.
MCW-CIMP 6	MCW-6	Stokes Creek	CMP	Grab	TMDL	Designated in the Bacteria TMDL monitoring plan.
MCW-CIMP 7	MCW-7	Lower Las Virgenes Creek	CMP	Grab	MS4 Receiving Monitoring Site, TMDL, 303(d)	Assigned compliance requirements in the Bacteria TMDL.
MCW-CIMP 8	CMS LVC 3	Lower Las Virgenes Creek	City of Calabasas	Observation and collection	TMDL	Designated in the Trash TMDL monitoring plan.
MCW-CIMP 9[1]	Downstream of MCW-10	Palo Comado Creek	CMP	Grab	TMDL	Designated in the Bacteria TMDL monitoring plan.
MCW-CIMP 10	MCW-11	Lower Medea Creek	CMP	Grab	MS4 Receiving Monitoring Site, TMDL, 303(d)	Assigned compliance requirements in the Bacteria TMDL.
MCW-CIMP 11[1]	Downstream of MCW-13 / CMS_LDC_2	Lower Lindero Creek	CMP	Grab / Observation and collection	TMDL, 303(d)	Designated in the Bacteria TMDL monitoring plan; Designated as CMS_LDC_2 in the Trash TMDL monitoring plan.

Proposed Site ID	Existing Site ID	Reach	Agency Currently Conducting Monitoring	Sample Collection Type	Impairment/ Monitoring Requirement	Notes on Site
MCW-CIMP 12	MCW-16	Triunfo (Lower)	CMP	Grab	MS4 Receiving Monitoring Site, TMDL, 303(d)	Assigned compliance requirements in the Bacteria TMDL.
MCW-CIMP 13	CMS_LDC_1	Upper Lindero Creek (Reach 2 and Lake Lindero)	Not currently monitored	Observation and collection	TMDL	Designated as CMS_LDC_1 in the Trash TMDL monitoring plan
MCW-CIMP 14	CMS_MDC_1	Upper Medea (Reach 2)	Not currently monitored	Observation and collection	TMDL	Designated as CMS_MDC_1 in the Trash TMDL monitoring plan
NSMBCW-RW2	-	Malibu Creek	Not currently monitored	Grab	TMDL	To be monitored by the North Santa Monica Bay Coastal Watersheds Group

Notes:

[1] Water quality samples at the Palo Comado and Lower Lindero Creeks were previously collected where the streams daylight from concrete box channels. To be more reflective of the receiving water quality of these reaches, these sites were relocated into natural channel sections several hundred feet downstream from the concrete outlet structures.

Monitoring at the bacteria TMDL monitoring sites is being performed under an approved coordinated monitoring plan. Agoura Hills is the lead agency for the bacteria TMDL monitoring under that TMDL monitoring plan.

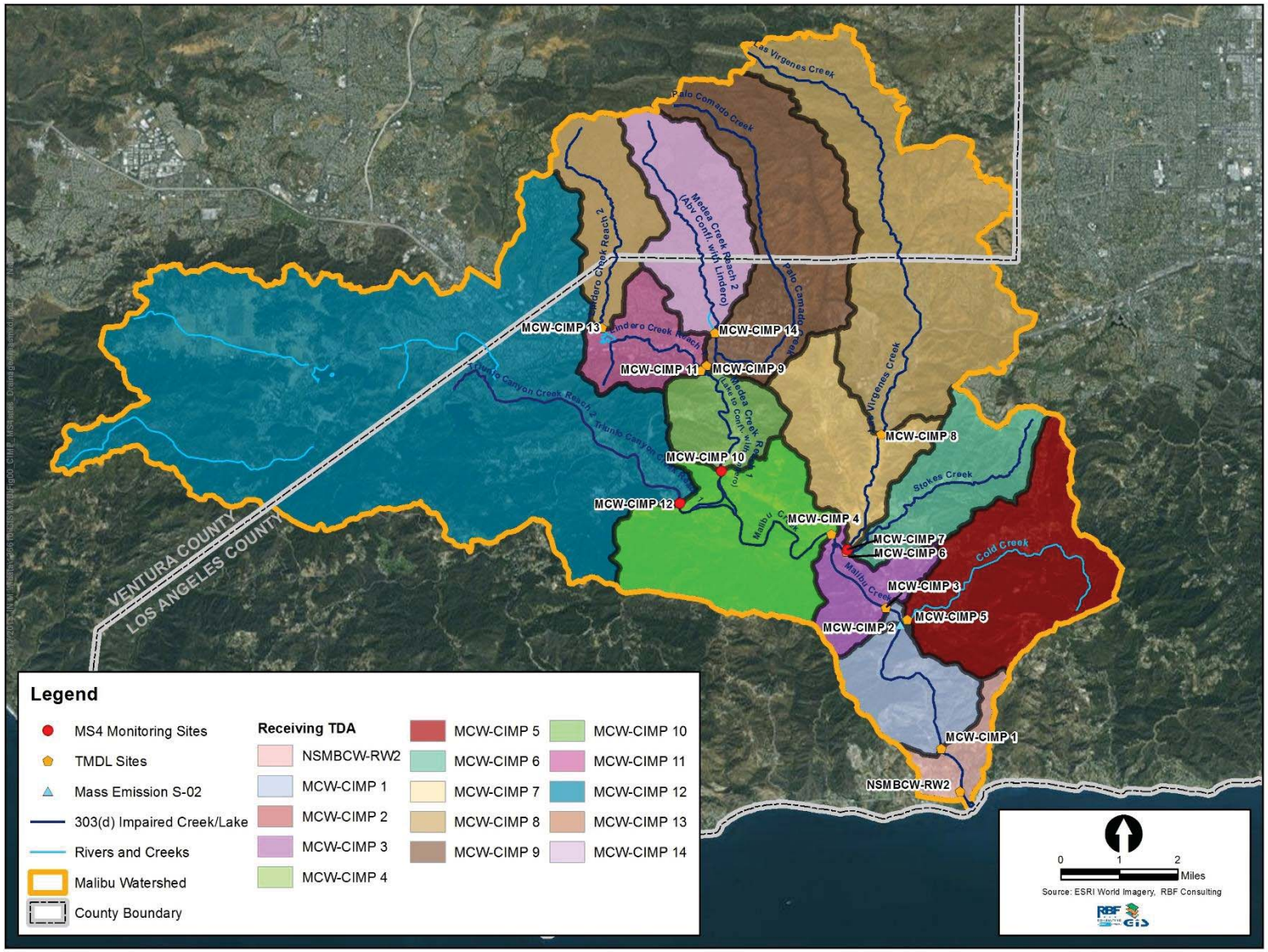
CMP – Coordinated Monitoring Plan

As listed in the table, monitoring will be performed at the mass emission station and at sites throughout the watershed as established in the monitoring plans for the Bacteria TMDL and Trash TMDL. The CIMP MS4 Stakeholders are coordinating with Ventura County for monitoring at Upper Lindero Creek and Upper Medea Creek.

Several sites are proposed for trash monitoring in addition to other constituents. However, the frequency of monitoring for trash and other constituents varies.

Figure 6 below shows the CIMP receiving water monitoring sites.

Figure 6: Proposed Receiving Water Monitoring Sites



4.1.1 Mass Emission Station

Mass Emission Station S-02 is an existing mass emission station with a robust existing dataset. The Los Angeles County Flood Control District (LACFCD) has been conducting monitoring at the site as part of its Core Monitoring Program. The goals of the mass emission system are to:

- Estimate the Mass Emission from the MS4
- Assess mass emission trends
- Determine whether the MS4 is contributing to exceedances of water quality standards by comparing results to applicable standards, including the Los Angeles Region Water Quality Control Plan (Basin Plan) and the California Toxics Rule (CTR).

The site is located on Malibu Creek just downstream from the confluence with Cold Creek and within the Cold Creek-Malibu Creek HUC-12 watershed. It is adjacent to Los Angeles County Stream Gage F130-9-R near Malibu Canyon Road, and south of Piuma Road. The tributary drainage area to the station is 104.9 square miles (of the 109.9 square miles that drains the entire Malibu Creek Watershed) (County of Los Angeles 2008). Because of the location of the site and the existing dataset, the site enables evaluation of long term temporal trends for a large portion of the upstream watershed. Monitoring continues at this location as a part of the CIMP.

The mass emission station in Malibu is equipped with an automatic sampler, including an integral flow meter for flow-composited sample collection. The LACFCD collects grab samples to test conventional pollutants and bacteria and composite samples for other pollutants.

Monitoring at the mass emission station will be conducted for the:

- TMDLs for bacteria, nutrients, and benthic community impacts;
- 303(d) parameters;
- Field parameters (flow, DO, conductivity, temperature, pH);
- Aquatic Toxicity; and
- Constituents from Table E-2 with Associated Minimum Levels (MLs).

A list of the TMDL monitoring constituents is presented in Table 8. For the TMDL regarding benthic community impacts, the monitoring at the mass emission station will include nutrients, dissolved oxygen, ammonia, chlorophyll *a*, TSS, and turbidity.

Table 8: TMDL Monitoring Constituents

Requirement	Monitoring Constituent
Bacteria TMDL	*E. coli* (Bacteria TMDL[1])
Trash TDML	Trash (Trash TMDL)
Nutrient TMDL	Total Phosphorus
	Total Nitrogen
	Nitrate as Nitrogen plus Nitrite as Nitrogen
Benthic Community Impairment TMDL	Dissolved oxygen
	Total Nitrogen
	Ammonia
	Total Phosphorus
	Chlorophyll *a*
	TSS
	Turbidity
	Benthic Algal Coverage[2]
	Benthic Community Diversity[2]
	Predictive Multi-Metric Index (pMMI) – SC-IBI[2]
	California Stream Condition Index (CSCI) – O/E[2]
SMB DDTs and PCBs	DDTs
	PCBs

Notes:

[1] Prior to the reconsideration amendment adopted in Resolution No. R12-009, fecal coliform was included as a numeric target for both geometric mean and single sample limits; however, the resolution states that fecal coliform is no longer a numeric target.

[2] Biological indices addressed as part of the SMC 5-year Regional Plan.

The 303(d) listed parameters that will be analyzed at the mass emission station include those that Malibu Creek is listed for in the 2010 303(d) list. The 303(d) monitoring constituents are listed in Table 9. 303(d) listed parameters will be monitored at three wet weather and two dry weather events per year. For the wet weather monitoring, the sites are monitored at the first significant storm event of the year and two additional storm events per season.

Table 9: 303 (d) Monitoring Constituents

Requirement	Monitoring Constituent
Other impairments identified on the CWA section 303(d) List for the receiving water or downstream receiving waters (Note: 303(d) listed pollutants are required to be monitored for the impaired and tributary water bodies)	Selenium (at Las Virgenes Creek, Lindero Creek Reach 1 and Reach 2, Malibu Creek, Madea Creek Reach 1, and Medea Creek Reach 2)
	Sulfates (at Malibu Creek)
	Lead (at Triunfo Canyon Creek Reach 1 & 2)
	Mercury (at Triunfo Canyon Creek Reach 1 & 2)
For wet weather, if the receiving water is listed on the CWA Section 303(d) list for sedimentation, siltation or turbidity:	TSS and SSC
For dry weather, when metals are monitored:	TSS
	Hardness (Lab Based)

Data collected at the site will enable estimates of pollutant loads from the entire portion of the watershed within the jurisdiction of the CIMP MS4 Stakeholders. The site will also be used to estimate loads from the Malibu Creek CIMP jurisdiction to downstream receiving water.

The data collected at Mass Emission Station S-02 will be compared to the applicable water standards, used to estimate pollutant loads and trends, and to evaluate the correlations between constituents of concern and TSS.

4.1.2 Permit Receiving Water Monitoring Program

As noted in Section 4.1, monitoring at each site is based on the permit requirements and TMDL and 303(d) impairments at each reach to meet all the objectives of the CIMP. To achieve the objectives of the CIMP and EWMP, MS4 receiving water monitoring locations were identified at the downstream ends of major reach segments. Three MS4 receiving water monitoring sites were identified at Medea Creek (MCW-CIMP 10), Triunfo Creek (MCW-CIMP 12), and Las Virgenes (MCW-CIMP 7). As noted previously, these locations include the impacts from upstream MS4 discharges and enable estimates of pollutant loads from the upstream drainage area, and thus analysis of compliance with TMDL WLAs. Therefore, constituents monitored will vary from site to site based on the aforementioned impairments. Sites designated as Permit receiving water monitoring sites include monitoring for constituents with MLs, aquatic toxicity, and other general constituents.

Permit receiving water monitoring sites will be monitored at three wet weather and two dry weather events per year for most constituents. Wet weather monitoring will occur at the first significant storm event of the year and two additional storm events per season. Dry weather monitoring will occur during the historically driest month and on one additional event. The constituents that will be monitored are shown in Table 10.

Table 10: Receiving Water Monitoring Constituents

Requirement	Monitoring Constituent
MS4 Permit (Wet and Dry Weather)	Flow, DO, pH, Specific Conductivity, Hardness and Temperature.
MS4 Permit (Dry Weather)	Hardness and TSS
SMB TMDLs (pollutants not included in Malibu TMDLs) at Mass Emission Station S-02)	DDTs (sediment)[2]
	PCBs (sediment)[2]
	Debris
TMDL monitoring for bacteria, trash, nutrients, and benthic community impairments conducted as part of the receiving water monitoring program	TMDL monitoring constituents listed in Table 8
Two storm events and one dry event (once during the first significant storm event of the year, and during the historically driest month of the year)	Aquatic Toxicity
One wet weather and one dry weather event. (once during the first significant storm event of the year, and during the historically driest month of the year)	Table E-2 Constituents
303(d) listed constituents conducted as part of the receiving water monitoring program	303(d) listed monitoring constituents listed in Table 9

Note:

[1] Flow will be measured where present. If no flow exists at the site during a monitoring event, photographs of the site and field notes will be collected.

[2] The CIMP MS4 Stakeholders will coordinate with the North Santa Monica Bay Coastal Watersheds Group to collect data on PCBs and DDTs for Malibu Creek.

4.1.3 Program Constituents with Associated Minimum Levels

Constituents with MLs will be monitored the first year of implementation during one wet weather and one dry weather event. Monitoring for these constituents will be conducted at the MS4 receiving water monitoring locations and is required during the first significant storm event and during August the historically driest month.

Where the parameter is not detected at the Method Detection Limit (MDL) for its respective test method or the result is below the lowest applicable water quality objective, it need not be further analyzed. If a parameter is detected exceeding the lowest applicable water quality objective during wet

weather then the parameter is analyzed for the remainder of the effective permit period during wet weather at the receiving water monitoring station where it was detected. If a parameter is detected exceeding the lowest applicable water quality objective during dry weather then the parameter will be analyzed for the remainder of the effective period of the permit during dry weather at the receiving water monitoring station where it was detected.

The constituents listed in Table E-2 of the MS4 permits with associated MLs are shown in Appendix I. The CIMP streamlines the analytes by incorporating analytes as allowed by the MS4 Permit and removing pollutants with associated MLs that have been monitored within the Malibu Creek Watershed but have not been historically detected.

4.2 TMDL Receiving Water Monitoring

The TMDL Monitoring Program includes monitoring to evaluate compliance with TMDL requirements for

- Bacterial indicators
- Trash monitoring
- Nutrient monitoring
- Monitoring for nutrient and sediment related to benthic community impairment
- DDTs and PCBs

This CIMP includes monitoring sites established in the monitoring plans for the bacteria and trash TMDLs. The frequency of monitoring for these two impairments is based on the TMDL monitoring plans. If the reaches are impaired for other TMDLs, samples will also be collected at these sites for those TMDLs. The frequency of monitoring for other TMDL impairments will be three wet weather and two dry weather events, with the exception of DDTs and PCBs, which will be three wet weather events.

4.2.1 Bacteria TMDL

All of the sites designated in the TMDL monitoring plan will continue to be monitored under this CIMP. As part of the preparation of the CIMP, historical data were reviewed. Data at several sites showed that there are very few exceedances at CIMP 1 (Lower Malibu Creek), CIMP 5 (Cold Creek), and CIMP 6 (Stokes Creek). Although existing monitoring shows that these sites had few exceedances of the TMDL targets, monitoring will be continued until sufficient data are collected to delist these reaches.

Two of the sites designated in the bacteria TMDL monitoring plan have been updated for the CIMP. Site MCW-CIMP 9 is located approximately 1,000 feet downstream of site MCW-10. MCW-CIMP 11 was moved 1,500 feet downstream of MCW-13. These sites are more representative of the reach segments that they are intended to characterize, Palo Comado Creek and Lower Lindero Creek, and resuspension of bed sediments at the previous monitoring site locations had been observed that may impact the monitoring data.

Monitoring for the bacteria TMDL will include analysis for *E. coli*. This is consistent with the most current requirements for the TMDL as updated during the reconsideration of the TMDL in 2012. The updates to the Bacteria TMDL were adopted by the LARWQCB through Resolution No. R12-009 (June 7, 2012). The resolution and reconsideration amendment revised the numeric targets of the TMDL at fresh waters designated for water contact recreation to be based on *E. coli* density. As a result, the TMDL no longer includes fecal coliform as a numeric target for compliance.

For bacteria TMDL sites, monitoring will be conducted on a weekly basis. When possible, the same day will be used for consistency (Tuesday has been used for previous analyses and may continue to be used

under the CIMP). The CIMP outfall monitoring plans are consistent with the revised Malibu Creek Bacteria TMDL requirements.

4.2.2 Trash TMDL

Trash monitoring data will be collected monthly or bimonthly at each site in accordance with the Trash Monitoring and Reporting Plan (TMRP) submitted to the LARWQCB on April 29, 2010. The TMRP is hereby incorporated into this CIMP as **Appendix G**.

The information collected during each monitoring event is based on the RTAP, and it will involve collecting information about the trash present along a 100-foot section of the stream. Trash monitoring will not be performed at areas deemed inaccessible due to limited access or safety concerns.

The CIMP MS4 Stakeholders are implementing full capture trash devices in the watershed. After implementation of the full capture devices in areas upstream of the designated trash monitoring sites, the stakeholders will continue to perform monitoring for trash at the designated monitoring sites for a period of two years. After this two year period, if trash is not found in deleterious amounts, monitoring will be discontinued, and the CIMP MS4 stakeholders will perform annual trash collection at the named receiving water monitoring sites for non-point sources of trash.

For each monitoring event, the field crew will walk the 100 foot section of the stream. As the field crew encounters trash, the items will be collected in trash bags using a trash collection device. During the trash collection, the crew will fill out a trash assessment worksheet to record the numbers of different types of trash items that are collected both in stream and on the banks of the stream. Additional information about the condition of the site and the monitoring event will be collected. After the monitoring event, the information about the trash will be estimated from the worksheet and the total weight of the trash collected will be estimated. In addition, the numbers and size of trash bags filled will be recorded.

4.2.3 Nutrient TMDL

Nutrient monitoring will be conducted at the following monitoring locations within the watershed: Malibu Creek (MES S-02), Lower Las Virgenes Creek (MCW-CIMP 7), Lower Medea Creek (MCW-CIMP 10), Lower Lindero Creek (MCW-CIMP 11), Upper Lindero Creek (MCW-CIMP 13), Triunfo Canyon Creek (MCWCIMP 12), Palo Comado Creek (MCW-CIMP 9) , Stokes Creek (MCWCIMP 6), and Cold Creek (MCW-CIMP 5). Monitoring for nutrient-related constituents of concern will be conducted during:

- Two dry weather events per year (the critical dry period and the following dry event)
- The first significant storm event of the year
- Two additional storm events per season

Analysis will be performed on samples for nutrients and other related parameters (including dissolved oxygen, percent algal cover, and chlorophyll *a*) as listed in Table 8.

4.2.4 Benthic Community Impairments

Monitoring for benthic community impairments will include monitoring for sediment and nutrient related constituents of concern and also bioassessment monitoring. The bioassessment monitoring program is described in the regional monitoring section of this CIMP. The monitoring for the chemical constituents of concern (including sediment and/or nutrients) will be conducted at reach monitoring locations within the watersheds for Malibu Creek, Lower Media Creek, Lower Las Virgenes Creek, Lower Lindero Creek, and Triunfo Canyon Creek. Monitoring for nutrients and sediment related constituents of concern will be conducted during:

- Two dry weather events per year (one summer dry event and one winter dry event);
- The first significant storm event of the year; and
- Two additional storm events per season.

Analysis will be performed on samples for sediment and nutrients and other related parameters (including dissolved oxygen, ammonia, nitrate, total nitrogen, and chlorophyll *a*) as listed in Table 8. Several of these parameters are related to parameters that will be monitored for the TMDL for nutrients. As part of the Regional Monitoring Program, which includes a bioassessment component, conditions of randomly selected sites will be assessed by scoring biological indicators using the appropriate indices (e.g., CSCI, D18 for benthic diatoms, S2 for soft algae, and California Rapid Assessment Method [CRAM] for riparian wetlands).

4.2.5 Santa Monica Bay TMDL for DDTs and PCBs

The CIMP MS4 stakeholders will collect stormwater at the mass emission station, and the laborabory will filter the samples and analyze the sediment for DDT and PCBs. High Resolution Mass Spectrometry (HRMS) will be used to analyze for DDTs (EPA method 1699) and PCBs (EPA method 1668). Concentrations of DDTs and PCBs and the estimated sediment load at the MES will be used to calculate the estimated loading of these constituents from the watershed. Stormwater waste load allocations will be evaluated based on a three year averaging period.

4.3 Monitoring Events

The constituents and frequencies for the receiving water monitoring sites are provided in Table 11. The frequency of monitoring at each site depends on the purpose of the monitoring at that site and the pollutants that are analyzed.

4.3.1 Wet Weather Monitoring

During the first year of monitoring, wet weather events will be initiated when there is a 70% chance of 0.25 inches of rain within a 24-hour period. Rainfall will be measured from Los Angeles County controlled rain gauges within the Malibu Creek Watershed. Because a significant storm event is based on predicted rainfall, it is recognized that this monitoring may be triggered without 0.25 inches of rainfall actually occurring. In this case, the monitoring event will still qualify as meeting this requirement provided that sufficient sample volume is collected to do all required laboratory analysis. Documentation will be provided showing the predicted rainfall amount. If a sufficient number of events are not collected early in the wet season, the CIMP MS4 Stakeholders will consider adjusting the threshold for initiation of monitoring.

Wet weather events will also have the additional requirement of increasing flow by 20% in the receiving waters (as proposed in the permit). This requirement is in response to the possible situation where rain events meeting the precipitation threshold do not produce sufficient runoff to sample. During wet weather events, rainfall amounts will be recorded, and the flow in reaches will be estimated. This information will be compared with the base flow to evaluate the relationship between rainfall and increases in flow (above base flow) at monitoring sites. The results will be included in the annual monitoring report for the first year of monitoring. After reviewing the data collected during the first year, the CIMP MS4 Stakeholders will consider adjusting the predicted rainfall needed to initiate monitoring. The consistency between sites (the flow increase at different sites will likely vary in response to a given amount of rainfall) and frequency of these events will be considered in the decision. Sampling events will be separated by a minimum of three days of dry conditions (less than 0.1 inches of rain each day).

During wet weather conditions, the CIMP MS4 Stakeholders conduct monitoring at the receiving water monitoring sites (Mass Emission Station, S-02, and the TMDL sites as shown in Table 11) during the first significant storm event of the year. In addition, two other storm events will be monitored during that same wet season. Aquatic toxicity is monitored twice per year during wet weather conditions at site S-02 (Mass Emission Station), CIMP 7, CIMP 10, and CIMP 12.

Receiving water monitoring activities are coordinated with outfall monitoring to the greatest extent practical. As described further below, CIMP outfall monitoring sites are coordinated with the nearest downstream receiving water monitoring site so that the potential impacts from MS4 discharges can be evaluated. When possible, downstream receiving water monitoring sites are monitored after the upstream outfall.

4.3.2 Dry Weather Monitoring

During dry weather conditions, the CIMP MS4 Stakeholders conduct monitoring at the receiving water monitoring sites and Mass Emission Station S02 at a minimum of two times per year. In addition, the agencies conduct monitoring at the sites shown in Table 11 at the frequency shown. At a minimum, one of the events at each site is monitored during the month with the historically lowest instream flows, or where instream flow data are not available, or during the historically driest month of August. Aquatic toxicity is monitored once per year during the critical dry weather condition.

Dry weather events are defined as periods with no rainfall above 0.1 inches within the 72 hours preceding the sample collection event, as measured from 50% or more of the Los Angeles County controlled rain gauges within the Malibu Creek watershed.

Table 11 shows the monitoring frequencies at the respective monitoring sites.

Table 11: Receiving Water Monitoring Sites with Constituents and Frequencies

Monitoring Site ID	MCW-CIMP 1	MASS EMISSION STATION S-02	MCW-CIMP 3	MCW-CIMP 4	MCW-CIMP 5	MCW-CIMP 6	MCW-CIMP 7	MCW-CIMP 8	MCW-CIMP 9	MCW-CIMP 10	MCW-CIMP 11	MCW-CIMP 12	MCW-CIMP 13	MCW-CIMP 14
Existing Site ID	MCW-2	Mass Emission S-02	MCW-3/ CMS_MC_1	MCW-4	MCW-5	MCW-6	MCW-7	CMS LVC 3	MCW-10 (Downstream)	MCW-11	MCW-13 (Downstream)/ CMS_LDC_2	MCW-16	CMS_LDC_1	CMS_MDC_1
Subwatershed	Lower Malibu Creek	Malibu Creek	Middle Malibu Creek	Upper Malibu Creek	Cold Creek	Stokes Creek	Lower Las Virgenes Creek	Lower Las Virgenes Creek	Palo Comado Creek	Lower Medea Creek	Lower Lindero Creek	Triunfo (Lower)	Upper Lindero (Reach 2)	Upper Medea (Reach 2)
Constituent	**Frequency**													
Bacteria TMDL														
E. coli	Weekly	3/2	Weekly	Weekly	Weekly	Weekly	Weekly		Weekly	Weekly	Weekly	Weekly		
Trash TMDL														
Trash	Conducted per Malibu Creek TMRP													
Nutrient TMDL														
Total Phosphorus		3/2			3/2	3/2	3/2		3/2	3/2	3/2	3/2	3/2	
Total Nitrogen		3/2			3/2	3/2	3/2		3/2	3/2	3/2	3/2	3/2	
Nitrate as Nitrogen plus Nitrite as Nitrogen		3/2			3/2	3/2	3/2		3/2	3/2	3/2	3/2	3/2	
Benthic Community Impairment TMDL [1]														
Total Phosphorus		3/2					3/2			3/2	3/2	3/2		
Total Nitrogen		3/2					3/2			3/2	3/2	3/2		
TSS		3/2					3/2			3/2	3/2	3/2		
Turbidity		3/2					3/2			3/2	3/2	3/2		
Dissolved Oxygen		3/2					3/2			3/2	3/2	3/2		
Ammonia		3/2					3/2			3/2	3/2	3/2		
Chlorophyll *a*		3/2					3/2			3/2	3/2	3/2		
SMB DDTs and PCBs TMDL														
DDTs and PCBs		3/0[3]												
303(d)														
TSS and SSC		3 [3]					3 [3]			3 [3]		3 [3]/2 [4]		
Hardness		3/2 [5]					3 [5]			3 [5]		3 [5]/2 [4]		
Selenium		3/2					3/2			3/2	3/2			
Sulfates		3/2												
Lead / Mercury												3/2		

MS4 Receiving Water														
Flow, DO, pH [5], Conductivity, Temperature		3/2					3/2			3/2		3/2		
Aquatic Toxicity		2/1					2/1			2/1		2/1		
Constituents with MLs[2]		1/1					1/1			1/1		1/1		

Notes:
Where the frequency is noted with two numbers (i.e., 3/2), the first number is the number of wet weather monitoring events and the second is the number of dry weather monitoring events within a monitoring year (July 1 through June 30). For example, Aquatic Toxicity at MCW-CIMP 2 will be monitored during two wet weather events and one dry weather event.

[1] Some of the Benthic Community Impairment TMDL biological indices, SC-IBI, SC-O/E, Benthic Algal Coverage, will be assessed by the SMC bioassessment program, which will randomly select 4 sites in the Santa Monica Bay Watershed (See Section 7.2). Total Phosphorus is included for both the Nutrient TMDL and the Benthic Community Impairment TMDL.
[2] During the first year of the monitoring program, the monitoring program includes analysis of the constituents with minimum levels (MLs) that are listed on Table E-2 of the MRP during the first significant storm and the critical dry event. These constituents are shown in Appendix I of this report. Subsequent years will include monitoring for pollutants tested above the ML.
[3] For the SMB DDTs and PCBs TMDL, DDT and PCBs will be monitored during wet weather; for the sedimentation/siltation 303(d) listing, TSS and SSC will be monitored during wet weather.
[4] For dry weather when metals are monitored, TSS and Hardness will be monitored.
[5] For 303(d) listing constituents, hardness and pH are required at receiving water monitoring sites during wet weather only; hardness and pH will be measured for wet and dry weather at Mass Emission Station S-02.

5 Stormwater Outfall Based Monitoring

The objectives of the stormwater outfall based monitoring program include the following:

a) Determine the quality of a Permittee's discharge relative to municipal action levels, as described in Attachment G of the Permit.
b) Determine whether a Permittee's discharge is in compliance with applicable stormwater WQBELs derived from TMDL WLAs.
c) Determine whether a Permittee's discharge causes or contributes to an exceedance of receiving water limitations.

5.1 Permit Requirements

The MS4 permit requires that the Permittees implement a stormwater outfall monitoring program during wet weather conditions. The permit details the following criteria that must be considered to select sites for the stormwater monitoring program:

1. The stormwater outfall based monitoring program must be representative of the CIMP MS4 Stakeholders' discharge with at least one major outfall per sub-watershed (HUC-12) drainage area.
2. The drainage(s) to the selected outfall(s) are representative of the land uses within the Permittees' jurisdiction.
3. The desktop survey must select outfalls with configurations that should facilitate accurate flow measurement and in consideration of safety of monitoring personnel.
4. The specific location of sample collection may be within the MS4 upstream of the actual outfall to the receiving water if field safety or accurate flow measurement require it.

5.2 Approach

A representative approach to characterize the stormwater discharge is employed. To accomplish this, one outfall is selected per HUC-12 with a tributary land use that is representative of the land uses within the HUC-12. Discharges will be sampled during three stormwater events each year to characterize the water quality discharged into the receiving waters. The timing of outfall monitoring will coincide with downstream receiving water monitoring. This approach is expected to work well in characterizing stormwater discharges and evaluating their impacts on receiving waters.

A desktop GIS exercise was conducted to determine the outfall sites within each of the HUC-12 sub-watersheds of the Malibu Creek Watershed to be sampled. Known stormwater outfalls (n=137) were overlayed on all available data within the Permittee(s) jurisdiction; this included:

- surface water bodies;
- HUC-12 boundaries;
- land use;
- impervious area (effective impervious area (EIA) is not currently available);
- jurisdictional boundaries;
- open channel pipes greater than 36 inches in diameter, and known underground pipes 18 inches diameter or greater (data does not exist in most areas for pipes 18 to 36 inches in diameter);
- dry weather diversions; and
- major outfall catchment areas.

The results of this study are shown in Figure 7 and summarized in Table 12.

Figure 7: CIMP Database Summary Map

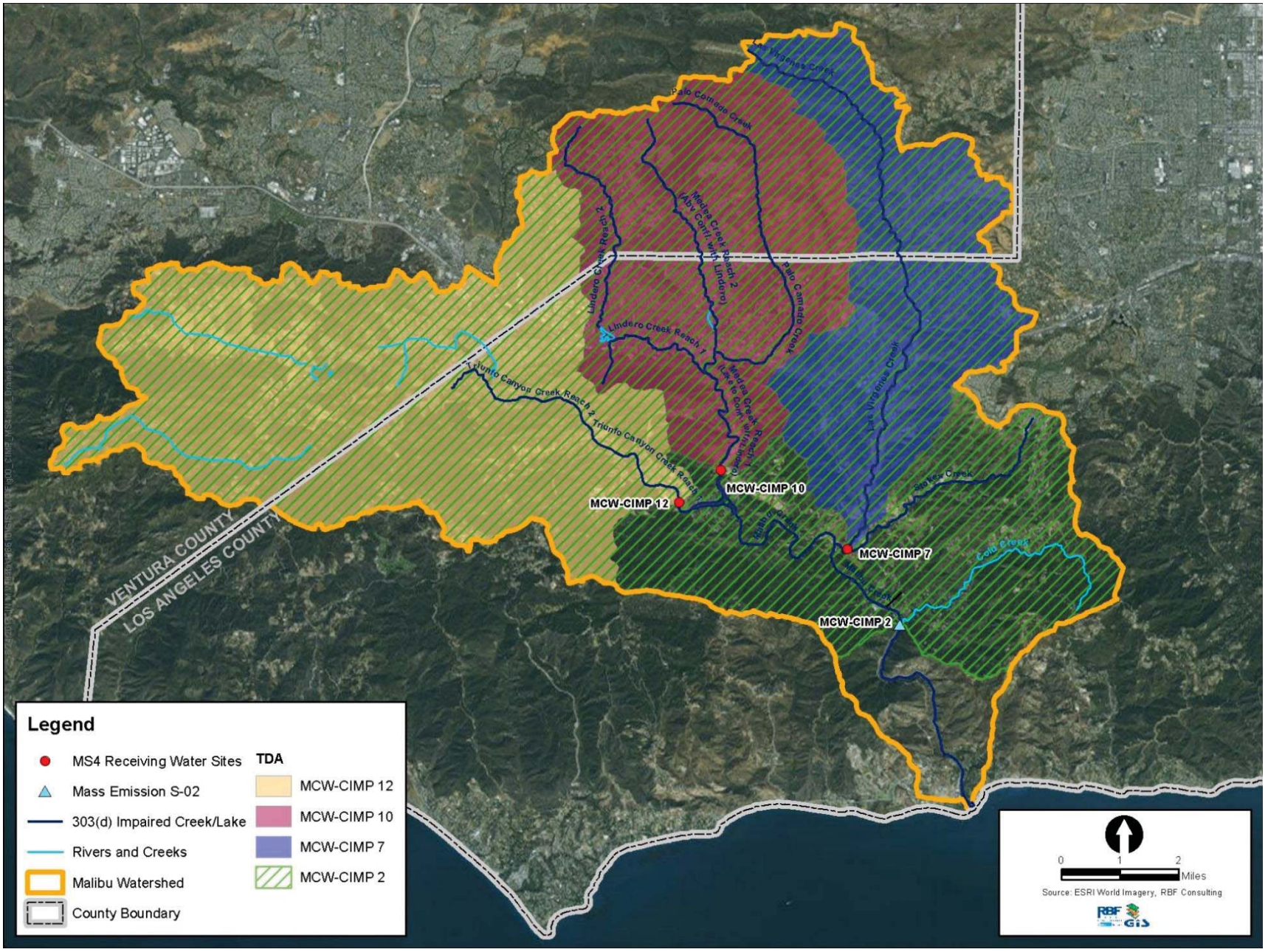


Table 12: HUC-12 Malibu Creek Sub-watershed Land Use Summary

Land Use (2008 SCAG)	Potrero Valley Creek (HUC-12 ID: 180701040101)		Medea Creek (HUC-12 ID: 180701040102)		Las Virgenes Creek (HUC-12 ID: 180701040103)		Cold Creek-Malibu Creek (HUC-12 ID: 180701040104)	
	Acres	%	Acres	%	Acres	%	Acres	%
Single Family Residential	760.5	9.9%	1,587.1	21.1%	1,008.2	9.6%	290.7	1.7%
Multi-Family Residential	111.0	1.4%	177.1	2.4%	156.9	1.5%	1.3	0.0%
Other Residential	265.9	3.5%	8.5	0.1%	62.0	0.6%	985.1	5.6%
General Office	137.7	1.8%	77.3	1.0%	127.3	1.2%	72.0	0.4%
Commercial and Services	107.5	1.4%	224.7	3.0%	36.5	0.3%	65.4	0.4%
Facilities	42.6	0.6%	138.7	1.8%	32.6	0.3%	89.4	0.5%
Education	35.7	0.5%	81.4	1.1%	181.3	1.7%	–	0.0%
Industrial	71.8	0.9%	139.9	1.9%	27.4	0.3%	151.6	0.9%
Transportation, Communications, & Utilities	25.1	0.3%	156.3	2.1%	461.9	4.4%	10.8	0.1%
Mixed Urban	–	0.0%	–	0.0%	2.5	0.0%	–	0.0%
Open Space and Recreation	197.2	2.6%	621.1	8.3%	78.6	0.8%	108.9	0.6%
Agriculture	120.0	1.6%	6.7	0.1%	43.6	0.4%	133.4	0.8%
Vacant	3,980.6	51.8%	2,932.1	39.1%	5,846.2	55.9 %	15,018.3	86.0%
Water	305.6	4.0%	15.1	0.2%	–	0.0%	0.3	0.0%
Under Construction	23.9	0.3%	5.4	0.1%	90.5	0.9%	51.1	0.3%
Undevelopable	1,130.9	14.7%	677.2	9.0%	1,786.6	17.1 %	108.7	0.6%
Unknown	364.4	4.7%	657.6	8.8%	511.8	4.9%	377.1	2.2%
Total	**7,680**	**100%**	**7,506**	**100%**	**10,454**	**100%**	**17,465**	**100%**

MS4 outfalls are typically found in developed areas of a watershed, and the Malibu Creek Watershed is largely undeveloped. As a result, the land uses tributary to the proposed stormwater outfall sites cannot be truly representative of the overall HUC-12 sub-watershed land use. However, since the objective of outfall monitoring is to evaluate the effects of MS4 discharges on receiving waters, selecting outfalls with tributary land use similar to the developed land uses within the HUC-12 is considered appropriate. Given this rationale, outfall sites were selected within each HUC-12 subwatershed based on land use characteristics that were representative of the developed portion of the HUC-12.

Field investigations were performed to evaluate access, safety, and any other potential restrictions. The sites that best met the criteria were identified. The chosen outfall monitoring site location, description, and permittee (owner) for each HUC-12 are listed in Table 13. The land use summary is reported in Table 14. Figure 8, Figure 9, Figure 10, and Figure 11 show the location of the outfall monitoring site in relation to the known outfalls in each HUC-12. Additional site information can be found in Appendix A.

The sites selected provide a best possible representation of the land uses in both the HUC-12 it represents as well as the watershed as a whole. As discussed earlier and shown in Table 12 the primary status of most of the land in the MCW is undeveloped / vacant with residential being the next major use. Other important but less prevalent sources include transportation / utilities, commercial, and industrial sources. Table 15 shows that there is a representative distribution of each of these sources in the four outfalls monitored and should individually provide understanding of sources in the HUC-12 but also cumulatively sources throughout the watershed.

Table 13: Malibu Creek Watershed Potential Monitoring Sites Summary

HUC-12 Name (HUC-12 ID / Total Outfall)	Permittee(s)	Monitoring Outfall ID (Latitude, Longitude)	Description
Potrero Valley Creek (180701040101 / 44)	Westlake Village	TRUNFOC-095A (34.132542, - 118.8219063)	27 inch RCP; northeast of Triunfo Canyon Creek and Lindero Canyon Rd.
Medea Creek (180701040102 / 39)	Agoura Hills	LNDRC-074 (34.155, -118.7912)	48 inch RCP; northwest of Lindero Creek and Thousand Oaks Blvd.
Las Virgenes Creek (180701040103 / 46)	Calabasas	LAVCR-054 (34.134801, -118.706786)	102 inch RCP ; northeast of Lost Hills Rd and Cold Springs St.
Cold Creek-Malibu Creek (180701040104 / 8)	Unincorporated	TRUNFOC-035 (34.11445, -118.779199)	36 inch RCP; northwest side of the bridge at the intersection of Troutdale and Mulholland Hwy.

Table 14: Outfall Monitoring Site Drainage Area Land Use Summary

Land Use (2008 SCAG)	Potrero Valley Creek (HUC-12 ID: 180701040101)		Medea Creek (HUC-12 ID: 180701040102)		Las Virgenes Creek (HUC-12 ID: 180701040103)		Cold Creek-Malibu Creek (HUC-12 ID: 180701040104)	
	Acres	%	Acres	%	Acres	%	Acres	%
Single Family Residential	1.52	5.3%	27.5	42.8%	74.40	12.0%	-	-
Multi-Family Residential	21.75	75.9%	-	-	-	-	-	-
Other Residential	-	-	-	-	-	-	7.71	43.0%
General Office	-	-	-	-	33.63	5.5%	0.31	1.7%
Commercial and Services	-	-	0.5	0.7%	8.78	1.4%	0.34	1.9%
Facilities	-	-	-	-	12.90	2.1%	-	-
Education	-	-	-	-	0.22	0.0%	-	-
Industrial	-	-	-	-	20.80	3.3%	-	-
Transportation, Communications, & Utilities	5.04	17.6%	10.4	16.1%	225.45	36.5%	3.14	17.5%
Mixed Urban	-	-	-	-	-	-	-	-
Open Space and Recreation	0.15	0.5%	1.4	2.2%	4.15	0.7 %	-	-
Agriculture	-	-	-	-	-	-	-	-
Vacant	-	-	-	-	216.94	35.1%	6.43	35.9%
Water	-	-	-	-	-	-	-	-
Under Construction	-	-	-	-	-	-	-	-
Undevelopable	0.18	0.6%	24.5	38.1	20.41	3.3%	-	-
Unknown	-	-	-	-	-	-	-	-
Total	**28.6**	**100%**	**64.4**	**100%**	**617.7**	**100%**	**17.9**	**100%**

Table 15: Outfall Monitoring Site Drainage Area Land Use Summary

Land Use	Potrero Valley Creek		Medea Creek		Las Virgenes Creek		Cold Creek-Malibu Creek	
	HUC-12	Outfall	HUC-12	Outfall	HUC-12	Outfall	HUC-12	Outfall
Residential	14.8%	81.2%	23.6%	42.8%	11.7%	12.0%	7.3%	43%
Commercial/ Industrial	5.2%	-	8.8%	0.7%	3.8%	12.3%	2.2%	3.6%
Undeveloped	73.4%	1.1%	56.7%	40.3%	74.8%	39.1%	87.5%	35.9%
Agriculture	1.6%	-	0.1%	-	0.4%		0.8%	
Transportation	0.3%	17.6%	2.1%	16.1%	4.4%	36.5%	0.1%	17.5%
Unknown	4.7%	-	8.7%	-	4.9%		2.1%	

Figure 8: Potrero Valley Creek Watershed Monitoring Map

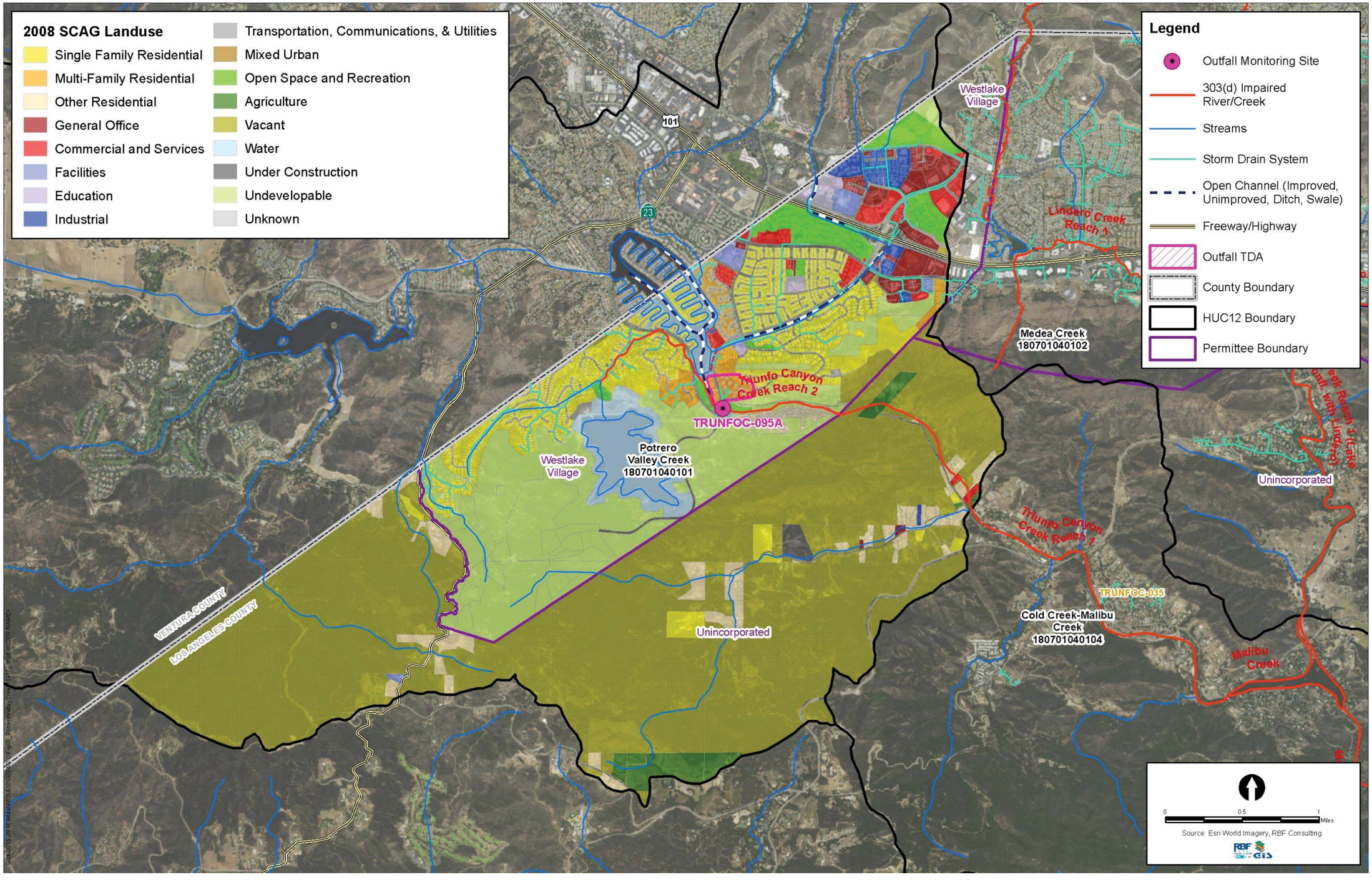


Figure 9: Madea Creek Watershed Monitoring Map

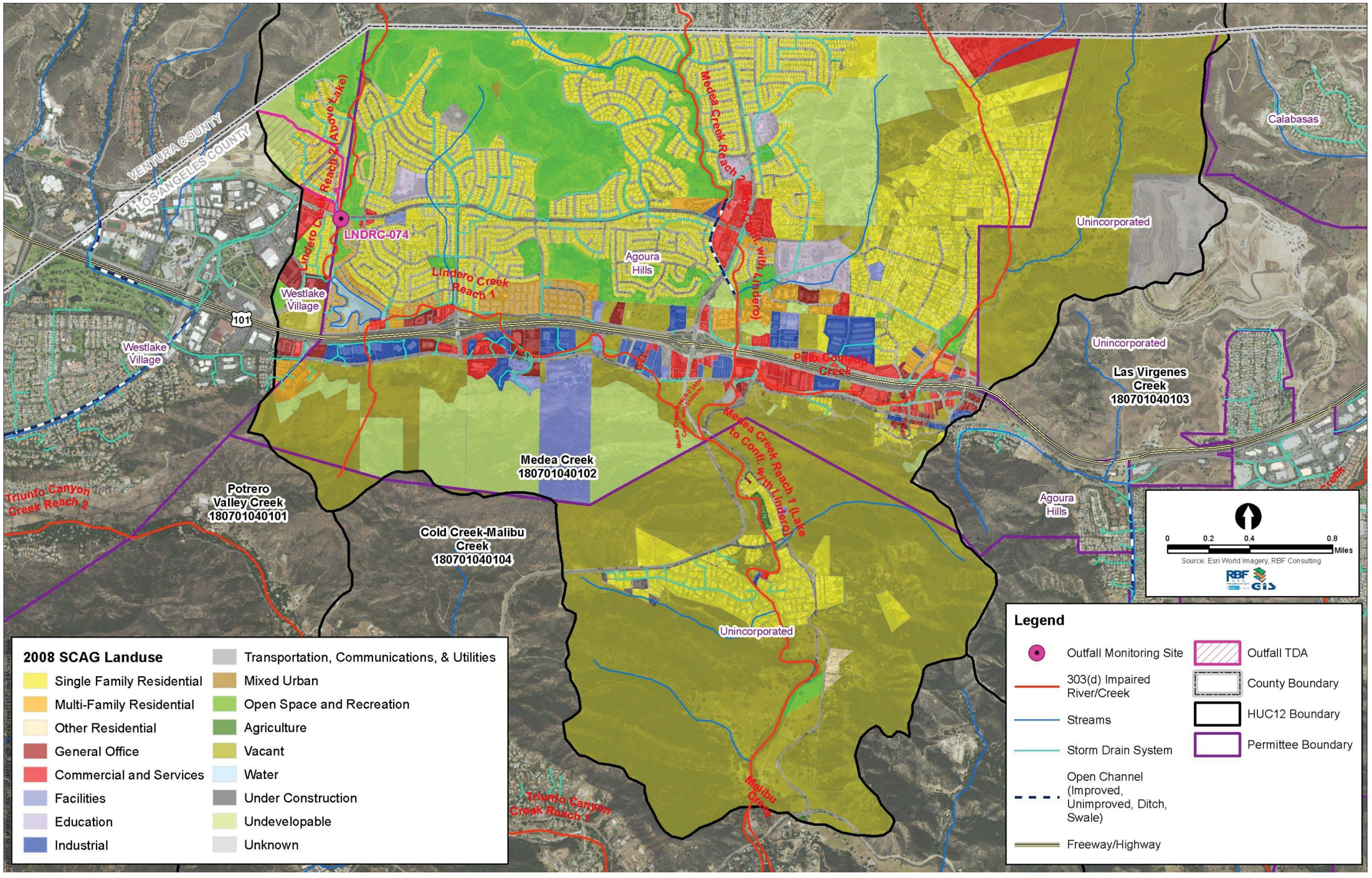


Figure 10: Las Virgenes Watershed Monitoring Map

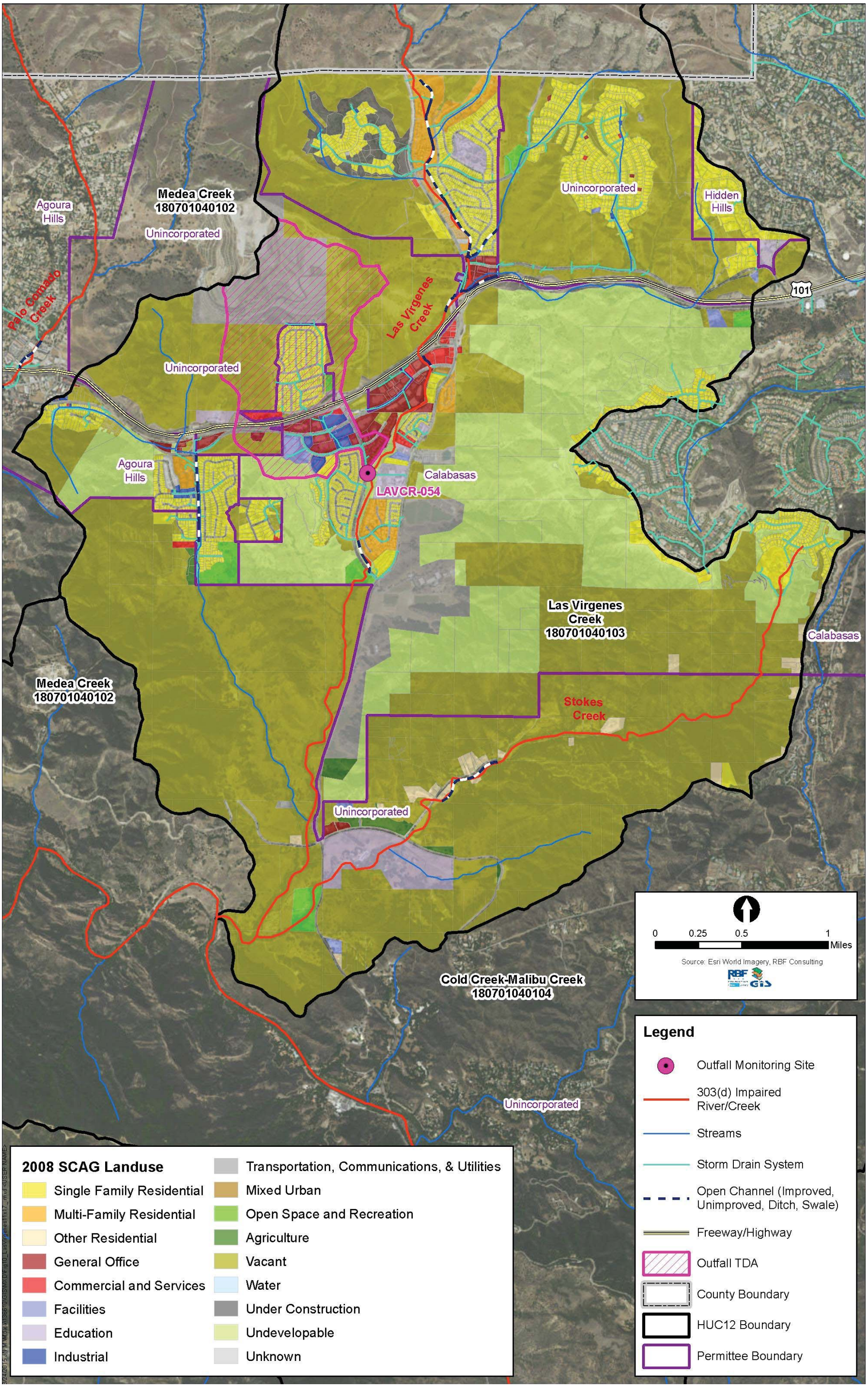
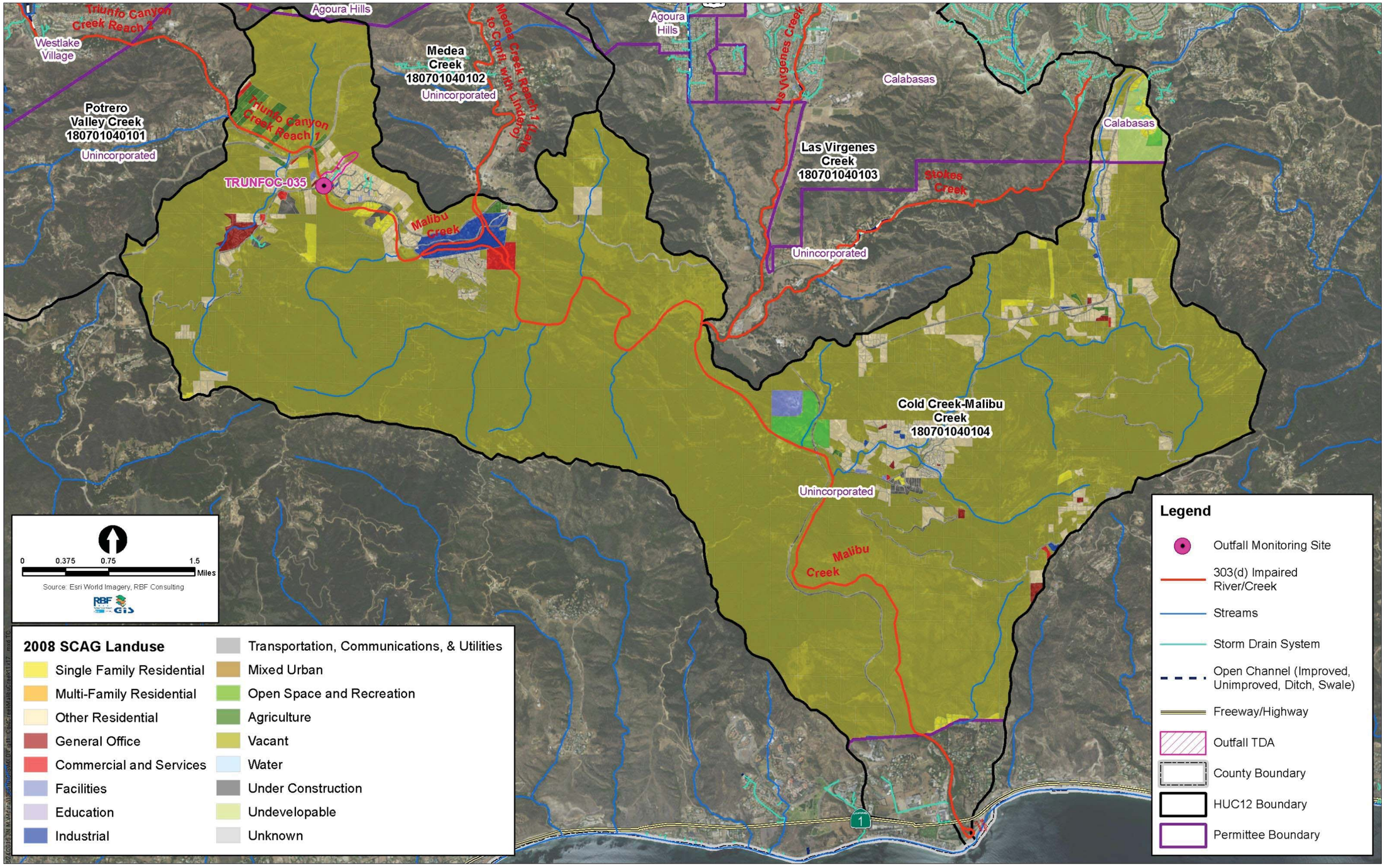


Figure 11: Cold Creek-Malibu Creek Watershed Monitoring Map



5.3 Monitoring Approach

Wet weather poses significant challenges for monitoring stormwater discharges from the MS4. Beyond safety concerns regarding outfalls and/or alternative access points; representative sampling and equipment security are major considerations. All of these restrictions have and will continue to be considered as monitoring activities commence. The selected outfalls will be monitored during wet weather conditions as follows:

1. Monitoring of stormwater discharges at the selected locations will occur during wet weather conditions resulting from the first rain event of the year, and at least two additional wet weather events within the same wet weather season. Permittees will target the first storm event of the storm year with a predicted rainfall of at least 0.25 inch at a 70% probability of rainfall at least 24 hours before the event start time. Because a significant storm event is based on predicted rainfall, it is recognized that this monitoring may be triggered without 0.25 inches of rainfall actually occurring. In this case, the monitoring event will still qualify as meeting this requirement provided that sufficient sample volume is collected to do all require d laboratory analysis. Documentation will be provided showing the predicted rainfall amount. Permittees will target subsequent storm events that forecast sufficient rainfall and runoff; however, the Permittees may adjust the criteria for monitoring events. Sampling events will be separated by a minimum of three days of dry conditions (less than 0.1 inch of rain each day).
2. At a minimum, the constituents in Section 5.3.1 will be monitored unless a surrogate pollutant has been approved by the Executive Officer of the Los Angeles Regional Water Quality Control Board (RWQCB).
3. Sampling sites will be outfitted with automatic samplers to collect a flow-weighted composite sample of the stormwater discharge over a 24-hour period or for the period of stormwater discharge if less than 24 hours.
4. The outfall sampling event will coincide with the receiving water monitoring activities.

Due to the temporal requirements and financial burden associated with installing auto-sampler stations at the outfall sites, a phased approach will be employed. Two outfall sampling sites will be installed each of the first two years of this monitoring program. The first complete wet season (2016-17 projected) sites TRUNFOC-035 and LAVCR-054 will be installed with LNDRC-074 and TRUNFOC-095A installed for the second complete wet season of monitoring. Sampling will not commence at each of the stations until the completion of the auto sampler installation.

5.3.1 Constituents

The requirements for the outfall monitoring program are outlined in section VI II of Attachment E of the permit. Constituents to be monitored at each outfall are based on the impairments previously identified at that reach and results from receiving water monitoring performed as part of this CIMP. These parameters include constituents with MLs (from Table E-2 of the permit), TMDL impairments, 303(d) listed impairments, or other exceedances of receiving water limitations. Monitoring of constituents identified in MLs (Table E-2 of the permit) will be performed for the first significant rain event of the first year of monitoring. Constituents exceeding the lowest applicable water quality objectives at the receiving water monitoring station sampled during the first significant rain event will be monitored for subsequent storm events. The constituents monitored at each of the stormwater outfall monitoring stations are outlined in Table 16.

Table 16: List of Parameters and Constituents required for Stormwater Outfall Monitoring

HUC-12	Potrero Valley	Medea Creek	Las Virgenes	Cold Creek-Malibu Creek
Bacteria TMDL *(E. coli)*				
E. coli	X	X	X	X
Trash TMDL				
Trash		X	X	X
Nutrient TMDL				
Total Phosphorus	X	X	X	X
Total Nitrogen	X	X	X	X
Nitrate as Nitrogen	X	X	X	X
Nitrate as Nitrogen + Nitrite as Nitrogen	X	X	X	X
Benthic Community Impairment TMDL				
Total Phosphorus			X	X
Total Nitrogen			X	X
TSS			X	X
Turbidity	X	X	X	X
Dissolved Oxygen			X	X
Ammonia			X	X
Chlorophyll *a*			X	X
Bioassessment Monitoring			X	X
Field Measurements				
Flow, DO, pH, Conductivity, Temperature	M	M	M	M
303(d) Listed Pollutants				
Sedimentation / Siltation – TSS and SSC	D	D	D	D
Benthic Community Impairment TMDL – Total Phosphorus, TSS, Turbidity, Total Nitrogen, Ammonia, Chlorophyl *a*	D	D		
Hardness & TSS	D	D	D	D
Selenium		D	D	D
Sulfates				D
Lead / Mercury	D			D
Aquatic Toxicity and Table E-2 Constituents (assigned MLs)				
Aquatic Toxicity	O	O	O	O
Constituents with MLs	E	E	E	E

[1] Hardness and TSS tests will be conducted in a lab.

M – Required during each event
X – Required to be monitored where downstream receiving waters have a WLA assigned in a TMDL.
D – Required to be monitored where downstream receiving waters are 303(d) listed for the specific pollutant of concern or constituents as addressed by a TMDLs.
O – To occur when triggered by recent receiving water toxicity monitoring. Refer to Section 6.3.
E – To be monitored at the outfalls in the following monitoring the year following detection in downstream receiving waters. Table E-2 constituents detected above relevant objectives in downstream receiving water and not otherwise addressed by TMDLs.

6 Non-Stormwater Outfall Based Monitoring

6.1 Permit Requirements

The non-stormwater outfall based monitoring plan identifies potential sources of pollutants during non-stormwater conditions. The objectives of the non-stormwater outfall based monitoring program include the following:

1. Determine whether a Permittee's discharge is in compliance with applicable non-stormwater WQBELs derived from TMDLs.
2. Determine whether a Permittee's discharge exceeds non-stormwater action levels, as described in Attachment G of this Order.
3. Determine whether a Permittee's discharge contributes to or causes an exceedance of receiving water limitations.
4. Assist a Permittee in identifying illicit discharges as described in Part VI.D.10 of the Permit.

The Non-Stormwater Outfall Screening Program is a multi-step process to identify and address non-stormwater discharges to the receiving waters. The following outfall screening and monitoring process is intended to meet the objectives of Part IX.A of the MRP:

1. Develop criteria or other means to ensure that all outfalls with significant non-stormwater discharges are identified and assessed during the Permit term.
2. For outfalls determined to have significant non-stormwater flow, determine whether flows are the result of illicit connections/illicit discharges (IC/IDs), authorized or conditionally exempt non-stormwater flows, natural flows, or from unknown sources.
3. Refer information related to identified IC/IDs to the IC/ID Elimination Program (Part VI.D.10 of the Permit) for appropriate action.
4. Based on existing screening or monitoring data or other institutional knowledge, assess the impact of non-stormwater discharges (other than identified IC/IDs) on the receiving water.
5. Prioritize monitoring of outfalls considering the potential threat to the receiving water and applicable TMDL compliance schedules.
6. Conduct monitoring or other investigations to identify the source of pollutants in non-stormwater discharges.
7. Use the results of the screening process to evaluate the conditionally exempt non-stormwater discharges identified in Parts III.A.2 and III.A.3 of the Permit and take appropriate actions pursuant to Part III.A.4.d of the Permit for those discharges that have been found to be a source of pollutants. Any future reclassification shall occur per the conditions in Parts III.A.2 or III.A.6 of the Permit.
8. Conduct monitoring or assess existing monitoring data to determine the impact of non-stormwater discharges on the receiving water.
9. Maximize the use of Permittee resources by integrating the screening and monitoring process into existing or planned CIMP efforts.

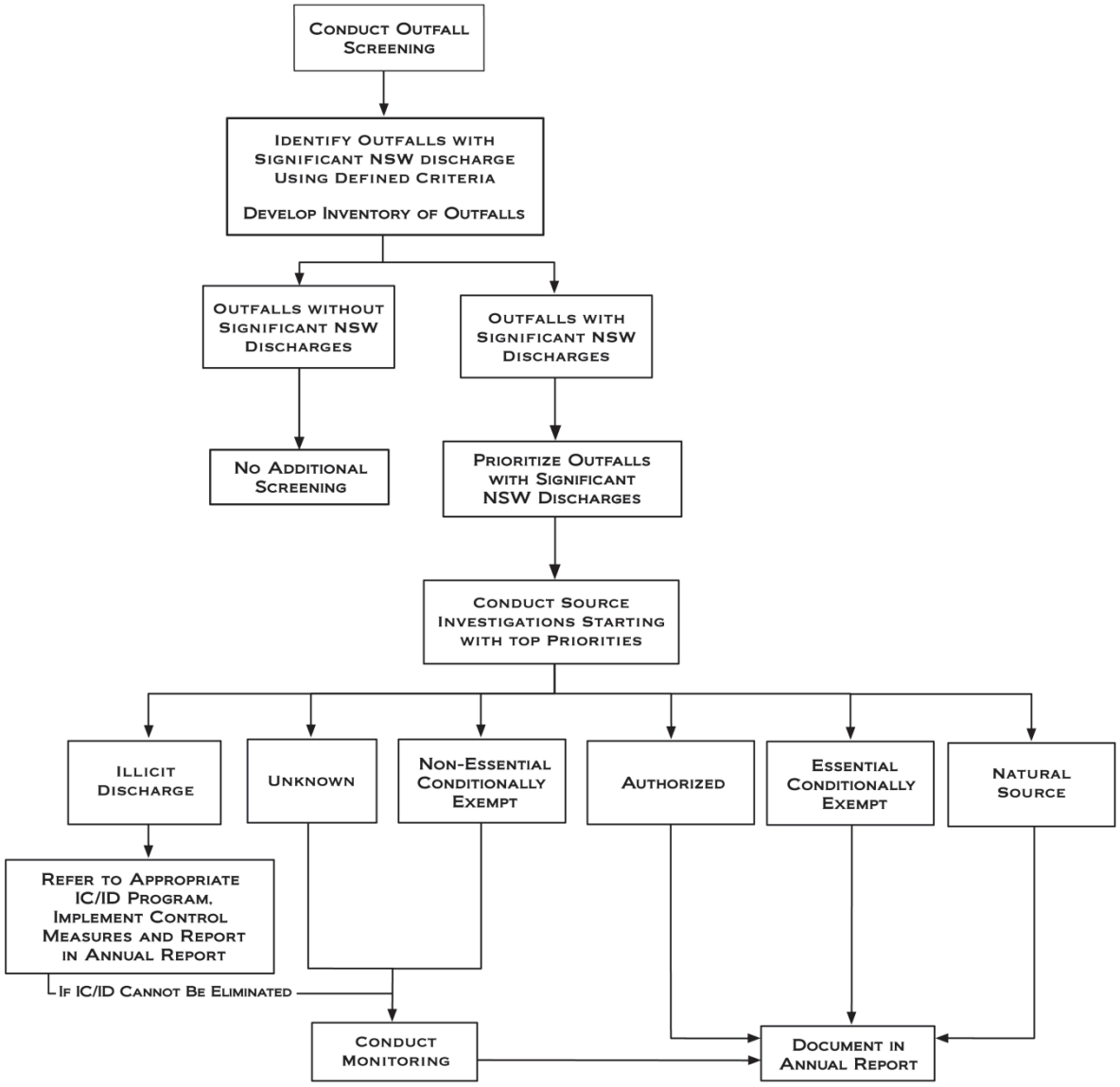
The non-stormwater screening process consists of the steps outlined in Table 17.

Table 17: Non-Stormwater Outfall Screening and Monitoring Program Summary

Element	Description
Develop MS4 outfall database	Develop a database of all major outfalls with descriptive information, linked to GIS.
Outfall screening	A screening process will be implemented to collect data for determining which outfalls exhibit significant NSW discharges.
Identification of outfalls with NSW discharge	Based on data collected during the Outfall Screening process, identify outfalls with NSW discharges.
Inventory of outfalls with significant NSW discharge	Develop an inventory of major MS4 outfalls with known significant NSW discharges and those requiring no further assessment.
Prioritize source investigation	Use the data collected during the screening process to prioritize significant outfalls for source investigations.
Identify sources of significant discharges	For outfalls exhibiting significant NSW discharges, perform source investigations per the prioritization schedule. If not exempt or unknown, determine abatement process.
Monitor discharges exceeding criteria	Monitor outfalls that have been determined to convey significant NSW discharges comprised of either unknown or non-essential conditionally exempt discharges, or continuing discharges attributed to illicit discharges must be monitored.

Figure 12 outlines the overall approach for this section in a flowchart highlighting the individual tasks to accomplish compliance on the above requirements.

Figure 12: Outline of the Non-Stormwater Outfall Program



6.2 Outfall Database

The non stormwater outfall screening program requires the development of an MS4 outfall database by the time that the CIMP is submitted. The objective of the MS4 database is to geographically link the characteristics of the outfalls within the EWMP area with watershed characteristics including: subwatershed, waterbody, land use, and effective impervious area. The database must contain the elements described in Section 6.3.3. The information will be compiled into geographic information systems (GIS) layers. Not all information was available at this time for submittal as part of the CIMP. Most items currently not available will be collected through implementation of the Non-Stormwater Outfall Screening Program as noted in the table footnotes. As the data becomes available, it will be entered into the database. Each year, the storm drains, channels, outfalls, and associated database will

be updated to incorporate the most recent characterization data for outfalls with significant non-stormwater discharge. The updates will be included as part of the annual reporting to the Regional Water Board.

6.3 Non-Stormwater Outfall Screening

6.3.1 Initial NSW Outfall Screening Process

The NSW outfall screening program will begin with a field check of all major outfalls as defined in the permit in the database to gather the necessary field information to populate the database. During the initial field screening, outfalls will be observed during dry weather, at least 72 hours after a rain event of 0.1 inches or greater and that period is not less than 72 hours after a rain event of 0.1 inch or greater. During the initial field screening, the following information will be gathered using the field inspection form in Attachment F or equivalent:

a. Date, Time, Weather
b. Photos of outfall and receiving water using a GPS-enabled camera
c. Coordinates of outfall
d. Physical descriptions of outfall, site condition, and accessibility
e. Discharge characteristics, such as odor and color
f. Presence of flow greater than trickle or no flow
g. Receiving water characteristics

After the initial event, all sites will be revisited for two more events. During the second and third screening events, all of the information listed above will be gathered. In addition, visual field estimates of flow will be gathered.

6.3.2 Identification of Outfalls with Significant Non-Stormwater Discharges

The three initial outfall screening events will be used to define the outfalls that require no further assessment and outfalls with significant non-stormwater discharges. Outfalls will be noted as requiring "No Further Assessment" in the outfall database if:

a. No flow is observed from the outfall.
b. The source is confirmed to be from NPDES permitted, categorically exempt essential flow or natural flow, or
c. Flow is categorized as not significant.

The MRP (Part IX.C.1) states that one or more of the following characteristics may determine significant non-stormwater discharges:

- Discharges from major outfalls subject to dry weather TMDLs.
- Discharges for which monitoring data exceeds non-stormwater action levels (NALs).
- Discharges that have caused or may cause overtopping of downstream diversions.
- Discharges exceeding a proposed threshold discharge rate as determined by the Group Members.
- Other characteristics as determined by the EWMP Group and incorporated within the screening program.

The data collected during the outfall screening process, along with other information about the outfall catchment area, will be used to determine which outfalls observed to be flowing during the screening

process will be categorized as having "significant discharge." Many factors will be taken into consideration when determining significant outfall discharges and will include the following criteria:

- Proximity of the outfall to the main stem of Malibu Creek where TMDLs apply.
- Outfall has persistent flows, meaning flow was observed on two or more of the three screenings at a rate "greater than a garden hose".
    - Flow will be categorized as follows:
        - No Flow/Wet (0 gpm)
        - Trickle (<2 gpm)
        - Garden Hose (2-10 gpm)
        - Greater than Garden Hose (>10 gpm)
- Characteristics of the catchment area, including but not limited to, presence of permitted discharges in the area, land use characteristics, and previous IC/ID results.

Outfalls with significant non-stormwater discharge will also be designated in an inventory to be included in the MS4 outfall database.

Reassessment of nonstormwater discharges will be conducted approximately 3 years following the completion of the outfall source identification. During these visits the CIMP non-stormwater screening will be conducted.

6.3.3 Inventory of MS4 Outfalls

An inventory of MS4 outfalls must be developed identifying those outfalls with known significant non-stormwater discharges and those requiring no further assessment (Part IX.D of the MRP). If the MS4 outfall requires no further assessment, the inventory must include the rationale for the determination of no further action required. The inventory will be included in the outfall database. Each year, the inventory will be updated to incorporate the most recent characterization data for outfalls with significant non-stormwater discharges.

The following physical attributes of outfalls with significant non-stormwater discharges must be included in the inventory. These characteristics will be collected as part of the screening process described in Section 6.3.2:

1. Date and time of last visual observation or inspection
2. Outfall alpha-numeric identifier
3. Description of outfall structure including size (e.g., diameter and shape)
4. Description of receiving water at the point of discharge (e.g., natural, soft-bottom with armored sides, trapezoidal, concrete channel)
5. Latitude/longitude coordinates
6. Nearest street address
7. Parking, access, and safety considerations
8. Photographs of outfall condition
9. Photographs of significant NSW discharge (or indicators of discharge) unless safety considerations preclude obtaining photographs. If unable to access the outfall to take a picture, consider finding an upstream manhole to check for flows and take a picture.
10. Estimation of discharge rate
11. All diversions either upstream or downstream of the outfall
12. Observations regarding discharge characteristics such as turbidity, odor, color, presence of debris, floatables, or characteristics that could aid in pollutant source identification.

13. Water flow condition in the receiving water at the point of discharge (dry, ponding, flowing, or tidal influence).

6.3.4 Outfall Source Identification

Once the major outfalls exhibiting significant NSW discharges have been identified through the screening process, the EWMP Group will prioritize the outfalls for further source investigations. The MRP identifies the following prioritization criteria for outfalls with significant NSW discharges:

1. Outfalls discharging directly to receiving waters with WQBELs or receiving water limitations in the TMDL provisions where final compliance deadlines have passed.
2. All major outfalls and other outfalls that discharge to a receiving water subject to a TMDL will be prioritized according to TMDL compliance schedules.
3. Outfalls for which monitoring data exist and indicate recurring exceedances of one or more of the Action Levels identified in Attachment G of the Permit.
4. All other major outfalls identified to have significant non-stormwater discharges.

The EWMP Group will additionally consider the following criteria to establish the prioritization schedule:

- Rate of discharge based on visual flow observations
- Size of outfall
- Discharges with odor, color, or cloudiness.
- Results of the field measurements of pH, temperature, DO, and EC
- Presence of flow in the receiving water

Once the prioritization is complete, a source identification schedule will be developed. The scheduling will focus on the outfalls with the highest priorities first. Unless the results of the field screening justify a modification to the schedule in the MRP, the schedule will ensure that source investigations are completed on no less than 25% of the outfalls with significant NSW discharges by December 28, 2015 and 100% by December 28, 2017.

6.3.5 Source Investigations

Source investigations will be conducted using site-specific procedures based on the characteristics of the NSW discharge and the techniques used by the EWMP members' IC/ID programs. Investigations may include:

1. Identifying permitted discharges within the catchment area.
2. Identifying if the flow is from a channelized stream or creek.
3. Compiling and reviewing available resources including past monitoring and investigation data, land use/MS4 maps, aerial photography, and property ownership information.
4. Following dry weather flows from the location where they are first observed in an upstream direction along the conveyance system.
5. Gathering field measurements to characterize the discharge.

Based on these results, permittees will classify the sources identified in the investigation into one of six categories defined below and conduct the required follow up action:

1. Authorized: If the source is determined to be an NPDES permitted discharge, the source must be documented and included in the annual report.
2. Essential Conditionally Exempt NSW discharges: If the source is determined to be a discharge subject to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),

or a conditionally exempt essential discharge, the Group Member must document the source and include in their annual report.

3. Natural flows: If the source is determined to be natural flows, the Group Member must document the source and include in their annual report.
4. IC/ID: If the source is determined to be an illicit discharge, the Group Member must implement procedures to eliminate the discharge consistent with IC/ID requirements and document actions. If attempts to terminate discharge are unsuccessful, document actions and conduct monitoring consistent with the MRP.
5. Non-essential Conditionally Exempt NSW discharges: For non-essential conditionally exempt discharges: conduct monitoring consistent with Part IX.G of the MRP to determine whether the discharge should remain conditionally exempt or be prohibited and document actions. Conduct monitoring consistent with the MRP.
6. Unknown sources: If the source is unknown, if attempts to terminate discharge are unsuccessful, document actions and conduct monitoring consistent with the MRP.

For outfalls with NSW flow determined to be authorized, natural, or essential conditionally exempt, the investigation will be concluded and the next highest priority outfall will be investigated and reported as part of the annual report. For sites where investigations determine that the source of the discharge is non-essential, conditionally exempt, an illicit discharge, or unknown, further investigation may be conducted to eliminate the discharge or demonstrate that it is not causing or contributing to receiving water impairments. If part of the investigation finds that any of the authorized or conditionally exempt essential non-storm water discharges identified in Parts III.A.1.a through III.A.1.c, III.A.2.a, or III.A.3 of the LA County MS4 permit is a source of pollutants that causes or contributes to an exceedance of applicable receiving water limitations and/or water quality-based effluent limitations, the Permittee shall notify the Regional Water Board within 30 days if the non-storm water discharge is an authorized discharge with coverage under a separate NPDES permit or authorized by USEPA under CERCLA in the manner provided in Part III.A.1.b above, or a conditionally exempt essential non-storm water discharge or emergency non-storm water discharge. In some cases this may require programmatic or structural BMPs to be implemented. Where Permittees determine that the NSW discharge will be addressed through modifications to programs or by structural BMP implementation, the Permittee will incorporate the approach into the implementation schedule developed in the EWMP. The outfall then can be lowered in priority for investigation, such that the next highest priority outfall can be addressed. All activities results should be maintained in the permittee's outfall database and summarized in the annual report.

6.4 Non-Stormwater Discharge Monitoring

If it is determined that an outfall has significant discharges comprised of either unknown or conditionally exempt non-stormwater discharges, continuing discharges must be monitored. The follow up monitoring will be coordinated with the dry weather receiving water monitoring schedule, so that the impacts of outfalls on receiving waters can be evaluated. As described in Section 4 of this report, dry weather receiving water monitoring will be conducted during two dry weather events. Monitoring will be conducted along with the following dry weather receiving water monitoring event and continue until the flow is satisfactorily resolved by:

- BMP treatment to stop the flow,
- the flow can be attributed to an allowable source, or
- the flow is proven to not contribute to any downstream impairment.

6.4.1 Monitoring Sites

The NSW outfall monitoring sites will be determined after source investigation of significant NSW discharges is concluded.

6.4.2 Monitored Parameters, Frequency, and Duration of Monitoring

The requirements for constituents to be monitored are outlined in Part VIII.G.1.a-e of the MRP. Outfalls will be monitored for all required constituents except toxicity. Non-stormwater outfall monitoring will include pollutants identified in a toxicity identification evaluation (TIE) conducted in response to observed aquatic toxicity during dry weather at the nearest downstream receiving water monitoring station during the last sample event, or will include aquatic toxicity if the TIE on the observed receiving water toxicity test was inconclusive. An overview of the constituents required to be monitored in the MRP at each NSW outfall monitoring site is listed in Table 18.

Table 18: Summary of Non-Stormwater Outfall Monitoring Parameters

Classification Identified in Permit	Preliminary List of Parameter(s)
General	Flow, hardness, pH, DO, temperature, SEC, and TSS
Pollutants assigned TMDL WLAs	See Table 16 for impairments at receiving waters
Pollutants identified for 303(d)-Listed receiving waters	See Table 16 for impairments at receiving waters
Toxicity	To be determined based on the results of TIE process as described in Appendix H
Parameters in Table E-2 of the MRP if they are identified as exceeding applicable water quality objectives	To be determined based on the results of the MRP screening as discussed in Section 6.1

[1] Dioxin measured and assessed as 2,3,7,8-TCDD only.

The MRP specifies the following monitoring frequency for NSW outfall monitoring as:

- For outfalls subject to a dry weather TMDL, the monitoring frequency shall be per the approved TMDL monitoring plan or as otherwise specified in the TMDL or as specified in an approved CIMP.
- For outfalls not subject to dry weather TMDLs, approximately quarterly for first year.
- Monitoring can be eliminated or reduced to twice per year, beginning in the second year of monitoring if pollutant concentrations measured during the first year do not exceed WQBELs, NALs or water quality standards for pollutants identified on the 303(d) List.

While a monitoring frequency of four times per year is specified in the Permit, it is inconsistent with the dry weather receiving water monitoring requirements. The receiving water monitoring requires two dry weather monitoring events per year. Additionally, during the term of the current Permit, outfalls are required to be screened at least once and those with significant NSW discharges will be subject to a source investigation. As a result, the EWMP Group will perform NSW outfall monitoring events twice per year. The NSW outfall monitoring events will be coordinated with the dry weather receiving water monitoring events to allow for an evaluation of whether the NSW discharges are causing or contributing to an observed exceedance of water quality objectives in the receiving water.

Since many of the NSW sources are intermittent, it is not expected that flow will exist during all sampling events. In these instances, no sample will be collected. Grab samples will be collected at sites with NSW flow as per the attached SOPs. Example QA/QC protocol and field measurement and chain of custody forms are provided in Appendix E. The constituents measured at each outfall will be dictated by the same criteria as stormwater outfall Section 5 and outlined in Table 16 based on the HUC-12 watershed where they are located and the downstream impairments.

6.4.3 Adaptive Monitoring

Monitoring for NSW discharges will be more dynamic than either the receiving water or SW outfall monitoring. As NSW discharges are addressed, monitoring at the outfall will cease. Additionally, if monitoring demonstrates that discharges do not exceed any WQBELs, NALs, or water quality standards for pollutants identified on the 303(d) list, a written request may be submitted to the Executive Officer of the Regional Water Board following one year of monitoring to reduce or eliminate monitoring of specified pollutants based on an evaluation of monitoring data. In addition, if monitoring at a particular outfall will cease or the location of outfall monitoring will be changed, a written request to the Executive Officer of the Regional Water Board is required. Thus, the number and location of outfalls monitored has the potential to change on an annual basis.

6.5 Non-Stormwater Outfall Monitoring Summary

NSW outfall monitoring sites will be determined after the screening events are completed and significant discharges are identified. Parameters that will be monitored at each NSW outfall site will depend upon the receiving water to which the NSW outfall monitoring site discharges.

7 Regional Studies

The permit requires that the responsible agencies perform regional studies to characterize the impact of the MS4 discharges on the beneficial uses of the receiving waters. TMDL special studies, SMC monitoring, and background monitoring were considered in this CIMP.

7.1 Special Studies

The TMDLs in the Malibu Creek Watershed do not require special studies to be conducted by the CIMP MS4 Stakeholders. The Nutrient TMDL for the Malibu Creek Watershed includes recommendations for special studies that are being considered as part of the EWMP. This section also presents potential special studies that could provide benefit to understand the potential sources for water quality impairments in the watershed.

7.1.1 Bacteria TMDL

The Malibu Bacteria TMDL does not require that the CIMP MS4 Stakeholders conduct special studies. However, several studies on the sources and dynamics of bacterial indicators and pathogens in the watershed have been conducted or are in progress in Malibu and Southern California. These studies aid in understanding the impact of natural sources of indicator bacteria and build a better understanding of sources at reference sites and within the Malibu Creek Watershed.

The County of Los Angeles has initiated a microbial source tracking study (MST) to determine whether the sources of bacteria are of anthropogenic or non-anthropogenic origin. If the sources are determined to be anthropogenic, the study will track the sources to their origin and identify the land uses and drainage areas that contribute to the problematic tributaries. The study includes ten sites proposed for sample collection in the CIMP. In addition, the study includes an outfall monitoring program. The findings of the source tracking study provide valuable information to identify potential sources of discharge that may be contributing loads to the MS4 and help improve efforts to reduce and eliminate the loads. Where possible monitoring data from the Microbial Source Tracking Study will be used to guide bacteria monitoring performed under the CIMP.

The Bacteria TMDL also requires that the State Parks conduct a study of bacteria loadings from birds in the Malibu Lagoon. The results from the State Parks study could help the agencies contributing to the CIMP characterize natural loads to impaired waters. Little information has been released from the State Parks about the plan and schedule for the study, but the CIMP MS4 Stakeholders continue to follow the progress, review the findings when they are made available, and adjust the CIMP as necessary.

The US Geological Survey conducted a study in cooperation with the City of Malibu to identify potential sources of bacteria at Malibu Lagoon and Surfrider Beach. They found that bacterial indicators from wastewater treatment systems are often absent in samples from wells. The report suggests that these are impacted by filtration, sorption, death, and predation between the sources and receiving waters. The study included additional research into potential sources of the bacterial indicators. Natural sources such as birds have been suggested, and high levels of bacterial indicators were identified in kelp washed up on the beach (USGS 2011).

The ongoing and recent studies on fecal bacterial indicators in the Malibu Creek Watershed are anticipated to provide valuable information to better understand sources and loads. The CIMP includes analysis of the results. These study results are coordinated with the EWMP implementation actions.

7.1.2 Nutrient TMDL

The Nutrient TMDL (USEPA TMDL) does not require special studies.

The CIMP MS4 Stakeholders will collect nutrient information through the monitoring program that can be used to analyze the impact of upstream reductions on receiving waters. The CIMP MS4 Stakeholders will continue to coordinate with other stakeholders who are conducting monitoring in the watershed to evaluate the impact of nutrients on water quality in the lagoon.

7.2 SMC Regional Monitoring (Bioassessment)

The SMC Regional Watershed Monitoring Program was initiated in 2008 to coordinate in-stream monitoring efforts and add consistency for the design, frequency and indicators. This program is conducted in collaboration with the Southern California Coastal Water Research Project (SCCWRP), State Water Board's Surface Water Ambient Monitoring Program, three Southern California Regional Water Quality Control Boards (Los Angeles, Santa Ana, and San Diego) and the Counties of Los Angeles, Ventura, Orange, Riverside, San Bernardino and San Diego. SCCWRP acts as the facilitator to organize the program and completes data analysis and report preparation.

The SMC monitoring program is intended to coordinate and leverage existing monitoring efforts to produce regional estimates of water quality condition, improve comparability and quality assurance between data sets, maximize data availability, and reduce monitoring expenditures.

Sampling occurs in 15 coastal southern California watersheds. Sites are sampled randomly across three land use types (open space, urban and agriculture). Six sites are sampled per year for each watershed. The Permittees support monitoring at the sites within watershed management areas that overlap with their jurisdictional area. Six random sites are assessed annually in the Santa Monica Bay Watershed Management area (LARWQCB, 2012a).

The LACFCD will continue to participate in the Regional Watershed Monitoring Program (Biosassessment Program) being managed by the Southern California Stormwater Monitoring Coalition (SMC). The LACFCD will contribute necessary resources to implement the bioassessment monitoring requirement of the MS4 permit on behalf of all permittees in Los Angeles County during the current permit cycle. Initiated in 2008, the SMC's Regional Bioassessment Program is designed to run over a five-year cycle. Monitoring under the first cycle concluded in 2013, with reporting of findings and additional special studies planned to occur in 2014. SMC, including LACFCD, has developed the bioassessment monitoring program for the next five-year cycle, which is scheduled to run from 2015 to 2019.

For the 2015 to 2019 bioassessment program, monitoring will be conducted at a total of 15 sites: four in the Santa Monica Bay watershed, three in the Santa Clara River watershed, four in the San Gabriel River watershed, and four in the Los Angeles River watershed. The SMC Program sites are randomly selected each year: approximately 70% of these samples will be from a new sample draw, while approximately 30% of the samples will be revisits to previously sampled probabilistic sites. Monitoring activities include, but is not limited to benthic macroinvertebrate sampling, water quality sampling, and physical habitat assessments conducted once a year. For the 2015 program, 2 sites are monitored in the Malibu Creek Watershed.

8 New Development and Re-Development Tracking Requirements in the NPDES Permit

Participating agencies have developed mechanisms for tracking new development/re-development projects that have been conditioned for post-construction BMPs pursuant to MS4 Permit Part VI.D.7. Agencies also have developed mechanisms for tracking the effectiveness of these BMPs pursuant to MS4 Permit Attachment E.X.

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Appendix A – Site Descriptions

Table A-1: Receiving Water Monitoring Sites

Name	Previous Site ID(s)	Latitude, Longitude	Notes	Pictures
MCW-CIMP 1	MCW-2	N 34° 02.825' W 118° 41.371'	Inside Serra Canyon Community at 23500 Palm Canyon. This site is located three miles below Tapia. This site is accessed through a private community off of PCH called Serra.	
MASS EMISSION STATION S-02	Mass Emission S-02	N 34°4'39.248" W 118°42'6.7"	The Malibu Creek monitoring station is located in the creek at the existing stream gauge station (i.e., Stream Gauge F130-9-R) near Malibu Canyon Road, south of Piuma Road. The tributary watershed to Malibu Creek at this location is 104.9 square miles, and the entire Malibu Creek Watershed is 109.9 square miles. This station can also be found in the Thomas Guide, page 628, H-1.	

Name	Previous Site ID(s)	Latitude, Longitude	Notes	Pictures
MCW-CIMP 3	CMS_MC_1	N 34° 4'56.85" W 118° 42'25.25"	Site located on the west bank immediately upstream of the Malibu Creek Canyon Road crossing and downstream of the Tapia WWTP facility.	 
MCW-CIMP 4	MCW-4	N 34° 06.001' W 118° 43.364'	This site is located at Malibu Creek in Los Angeles County unincorporated area, above the confluence with Las Virgenes Creek.	

Name	Previous Site ID(s)	Latitude, Longitude	Notes	Pictures
MCW-CIMP 5	MCW-5	N 34° 04.739' W 118° 41.996'	From 101 Freeway, go south on Las Virgenes Road. Make a left on Piuma Road. Off of Piuma Road, between Crater Camp Drive and Live Oak Circle Drive.	
MCW-CIMP 6	MCW-6	N 34° 05.889' W 118° 42.748'	This site is located in Malibu Creek State Park. Once you enter Malibu Creek State Park from the Las Virgenes Road entrance, pass the booth and make an immediate left onto the gravel road. Continue down the road until you reach the tan and green building. Access to the creek is located behind the tan and green building.	
MCW-CIMP 7	MCW-7	N 34° 05.769' W 118° 43.072'	This site is located in Malibu Creek State Park. It is off a bridge near the Las Virgenes Road entrance. Site is located directly above area that is used for recreation so the results are not skewed by contributions of bacteria from recreational users.	

Name	Previous Site ID(s)	Latitude, Longitude	Notes	Pictures
MCW-CIMP 8	CMS_LVC_3	N 34° 7'34.01" W 118° 42'24.61"	Site located in the concrete channel just downstream of the Lost Hills Road crossing	
MCW-CIMP 9	Downstream of MCW-10	N 34°8'29.44 W 118°45'36.81"	From the 101 Freeway, exit Kanan Road and go south. The site is located approximately 1,000 feet downstream of site MCW-10. The site is accessible from the shoulder of Cornell Road.	
MCW-CIMP 10	MCW-11	N 34°06.921' W 118°45.339'	This site is situated in Paramount Ranch (Santa Monica Mountains National Recreation Area) at the Cornell Road entrance at the bridge at the edge of the parking lot.	

Name	Previous Site ID(s)	Latitude, Longitude	Notes	Pictures
MCW-CIMP 11	MCW-13; CMS_LDC_2	N 34° 8'24.41" W 118° 45' 41.72"	Site located downstream of the Agoura Road crossing. The site is located approximately 1,500 feet downstream of MCW-13. The site is accessible from a pull-out along Kanan Road.	
MCW-CIMP 12	MCW-16	N 34°6'26.28" W 118°46'4.368"	Site is located northwest of the intersection of Lake Vista Drive and Green River Ranch. Site is accessed by turning from Lake Vista Drive onto Green River Ranch and going approximately 250 feet up Green River Ranch and then walking 50 feet north toward Triufo Creek. .	
MCW-CIMP 13	CMS_LDC_1	N 34° 9'20.26" W 118°47'27.41"	Site located in the concrete channel just upstream of Thousand Oaks Boulevard crossing and just downstream of the golf facility driving range	

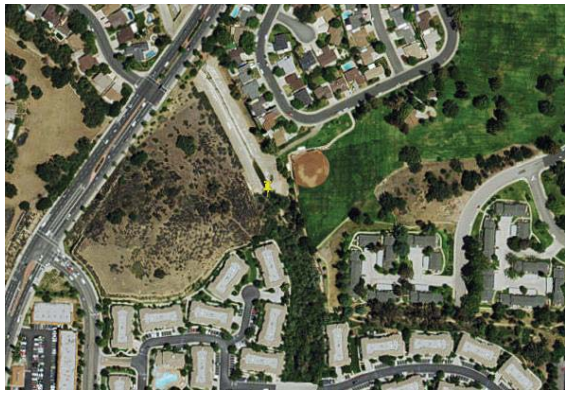
Name	Previous Site ID(s)	Latitude, Longitude	Notes	Pictures
MCW-CIMP 14	CMS_MDC_1	N 34°8'58.686" W 118°45'28.055"	From the 101 Freeway, exit Kanan Road and go North approximately 0.3 miles. The site is located in the concrete channel on the south side and approximately 500 feet downstream of Kanan Road.	

Table A-2: Malibu Creek Watershed Outfall Monitoring Sites

HUC-12 Name (HUC-12 ID/ Total Outfall)	Permittee(s)	Monitoring Outfall ID (Latitude, Longitude)	Notes	Pictures
Potrero Valley Creek (180701040101/ 44)	Westlake Village	TRUNFOC-095A (34.132542, -118.8219063)	The sampling site (the outfall) is located east of Lindero Canyon Road. The outfall is just below the northernmost light pole located on the bridge. From Lindero Canyon Road, the outfall is approximately 90 feet. The site can also be accessed from Ridgeford drive on the north side of the outfall. There is a dirt slope to be traversed to get down to outfall for sampling. Samples will be collected directly from the outfall.	 
Medea Creek (180701040102/ 39)	Agoura Hills	LNDRC-074 (34.155, -118.7912)	The sampling site (the outfall) is located north of E Thousand Oaks Blvd, on the west side of the creek. The site can be accessed from E. Thousand Oaks Blvd just east of Sienna Way, but west of Lake Lindero Drive. Samples will be collected directly from the outfall.	 

HUC-12 Name (HUC-12 ID/ Total Outfall)	Permittee(s)	Monitoring Outfall ID (Latitude, Longitude)	Notes	Pictures
Las Virgenes Creek (180701040103/ 46)	Calabasas	LAVCR-054 (34.134801, -118.706786)	The sampling site (the outfall) is located on the north side of the bridge on the Lost Hills Road side of the stream bank. The site can be accessed from Lost Hills Road. If traveling north, the site is just past Cold Springs Street. There is a pedestrian bridge crossing over the stream; The outfall can be accessed from the top by way of a grouted rip rap slope or from the side along a vegetated path. Samples will be collected directly from the outfall.	 
Cold Creek-Malibu Creek (180701040104/ 8)	Los Angeles County	TRUNFOC-035 (34.11445, -118.779199)	The sampling site (outfall location) is on the northwest side of the bridge near the intersection of Troutdale Drive and Mulholland Highway. The site can be accessed from north of the intersection of Mulholland Hwy and Waring Drive. Vehicular access is available through an existing Los Angeles County Public Work fence; or the site can be accessed from the walkway just east of the gate. Site is also accessible through the Peter Strauss Ranch/Santa Monica Mountains National Recreation Area.	 

Appendix B – Quality Assurance/Quality Control

(Adapted from the Los Angeles County 2012-2013 Annual Monitoring Report and Caltrans Guidance Manual: Stormwater Monitoring Protocols – July 2000)

Quality assurance/quality control (QA/QC) is an essential component of the monitoring program. Valuation of Analytes and QA/QC Specifications for Monitoring Program (Woodward-Clyde, 1996) describes the procedures used for bottle labeling, chain-of-custody (COC) tracking, sampler equipment checkout and setup, sample collection, field blanks to assess field contamination, field duplicate samples, and transportation to the laboratory. An important part of the QA/QC plan is the continued education of field personnel. Field personnel will be trained from the onset and will be informed regarding new or revised stormwater sampling techniques on a continual basis. Field personnel also will evaluate the field activities required by the QA/QC plan, and the plan updated if necessary. Accurate data will be obtained by proper monitoring station setup, water sample collection, sample transport, and laboratory analyses.

QA/QC for sampling processes included proper collection of the samples to minimize the possibility of contamination. Samples will be collected in clean sample bottles, sterilized by the laboratory. Sampling personnel will be trained according to the field sampling standard operating procedures (SOPs). Additionally, the field staff will be made aware of the significance of the project's detection limits and the requirement to avoid contamination of samples.

Field Setup Procedures

Automated field sampling sites will be at fixed locations, with the sampler placed on a public road or flood control right-of-way or other acceptable location. Following the initial sample collection, field staff will prepare the sampler to collect subsequent samples (dry weather mode) until the entire set has been completed for that station. Manual samples may be collected by field staff at the time they pre-programmed the auto sampler to begin collecting at each station. Inspection of visible hoses and cables will be performed to ensure proper working conditions according to the station design. Inspection of the intake tube, pressure transducer, and auxiliary pump was performed during daylight hours in normal (i.e., non-storm) conditions. The automated samplers will be checked at the beginning of the storm (i.e., during grab sample collection) to ensure proper working condition and to determine whether flow composite samples will be collected properly. Dry weather collection techniques will be similarly performed for both grab samples and 24-hour composite samples. When a complete set of samples had been collected for a given event, the bottles will be removed from the sampler and packed with ice and foam insulation inside individually marked ice chests. COC forms will be completed by field staff before transporting the samples to the laboratory. Under no circumstances will samples be removed from the ice chest during transportation from the field to the laboratory.

Grab Sampling Techniques

Where practical, all grab samples will be collected by direct submersion at mid-stream, mid-depth using the following procedures:

- Follow the standard sampling procedures.
- Remove the lid, submerge the container to mid-stream/mid-depth, let the container fill and secure the lid. In the case of mercury samples, remove the lid underwater to reduce the potential for contamination from the air.
- Place the sample on ice.
- Collect the remaining samples including quality control samples, if required, using the same protocols described above.

Bottle Preparation

A minimum of three sets of bottles will be prepared for each monitoring station so that change-outs can be made quickly between closely occurring storms. Bottle labels included the following information:

- LACFCD's Field Sample Identification (FSID) number (Mass Emission Station) or other Sample ID Number.
- Station (site) number.
- Station (site) name.
- Laboratory analysis requested.
- Date (written at time of sampling).

Bottles will be cleaned at the laboratory prior to use, labeled, and stored in sets. Each station will be provided with the same number, type, and size bottles for each rotation, unless special grab samples will be required. Clean composite sample bottles with sterile stoppers will be placed in the automated sampler when samples will be collected. This practice ensured readiness for the next storm event. All bottles not in use at the time of sampling will be stored in clean dry conditions for later use. Composite sample bottles will be limited to a maximum of 2.5 gallons each, to ensure ease of handling.

Chain-of-Custody Procedure

COC procedures (Woodward-Clyde, 1996) will be used for all samples throughout the collection, transport, and analytical process. Samples will be considered to be in custody if they were: (1) in the custodian's possession or view (2) retained in a secured place (under lock) with restricted access, or (3) placed in a container and secured with an official seal to prevent the sample from being reached without breaking the seal. COC records, field logbooks, and field tracking forms will be the principal documents used to identify samples and to document possession. The COC procedures will be initiated during sample collection. A COC record will be provided with each sample or group of samples. Each person with sample custody signed the form and ensured the samples will not be left unattended unless properly secured. Documentation of sample handling and custody included the following:

- Bottle label information (i.e., the LACFCD FSID number, station (site) number, station (site) name, laboratory analysis requested, and date (written at time of sampling)).
- Time (written at time of sampling).
- Number of bottles.
- Temperature of sample.
- Sampler(s), laboratory and sampler/courier signatures, and time(s) sample(s) changed possession (completed upon sample transfer(s)).

New Zealand Mud Snails

Due to concern about the spread of New Zealand Mud Snails, additional decontamination of monitoring equipment between Malibu MES and tributary monitoring stations was conducted. A designated set of sampling equipment (exclusive of temperature and pH field meters) will be used for each of the stations in the Malibu watershed (Malibu MES and tributary stations), and decontaminated before and after each event. Decontamination procedures as described by the California Department of Fish and Game (Hosea and Finlayson, 2005) will be employed and include immersion of sampling equipment in Sparquat 256.

Field meters use sensitive osmotic membranes for use in measurement of pH. Therefore, the use of freezing or Sparquat 256 as a decontamination method was not employed. Field meters will be visually inspected after use at each location; and all snails, mud, algae, and debris will be removed. The meters will be then thoroughly rinsed on-site with tap water and allowed to dry completely. Visual inspection of the field meters was completed prior to departure from the station and before use at the next monitoring location.

Laboratory QA/QC

All data reported by the analytical laboratory must be carefully reviewed to determine whether the project's data quality acceptability limits or objectives (DQOs) have been met. This section describes a process for evaluation of all laboratory data, including the results of all QA/QC sample analysis.

Before any results are reported by the laboratory, the deliverable requirements should be clearly communicated to the laboratory, as described in the "Laboratory Data Package Deliverables" discussion on Page B-4.

The current section discusses QA/QC data evaluation in the following two parts:

A. Initial Data Quality Screening
B. Data Quality Evaluation

The initial data quality screening identifies problems with laboratory reporting while they may still be corrected. When the data reports are received, they should be immediately checked for conformity to chain of custody requests to ensure that all requested analyses have been reported. The data are then evaluated for conformity to holding time requirements, conformity to reporting limit requests, analytical precision, analytical accuracy, and possible contamination during sampling and analysis. The data evaluation results in rejection, qualification, and narrative discussion of data points or the data as a whole. Qualification of data, other than rejection, does not necessary exclude use of the data for all applications. It is the decision of the data user, based on specifics of the data application, whether or not to include qualified data points.

INITIAL DATA QUALITY SCREENING

The initial screening process identifies and corrects, when possible, inadvertent documentation or process errors introduced by the field crew or the laboratory. The initial data quality control screening should be applied using the following three-step process:

1. Verification check between sampling and analysis plan (SAP), chain of custody forms, and laboratory data reports

Chain of custody records should be compared with field logbooks and laboratory data reports to verify the accuracy of all sample identification and to ensure that all samples submitted for analysis have a value reported for each parameter requested. Any deviation from the SAP that has not yet been documented in the field notes or project records should be recorded and corrected, if possible.

Sample representativeness should also be assessed in this step. The minimum acceptable storm capture parameters (number of aliquots and percent storm capture) per amount of rainfall are specified in Section 10. Samples not meeting these criteria are generally not analyzed; however, selected analyses can be run at the stakeholder's discretion. If samples not meeting the minimum sample representativeness criteria are analyzed, the resulting data should be rejected ("R") or qualified as estimated ("J"), depending upon whether the analyses will be approved. Grab samples should be taken according to the timing protocols specified in the SAP.

Deviations from the protocols will result in the rejection of the data for these samples or qualification of the data as estimated. The decision to reject a sample based on sample representativeness should be made prior to the submission of the sample to the laboratory, to avoid unnecessary analytical costs.

2. Check of laboratory data report completeness.

As discussed in Section 12, the end product of the laboratory analysis is a data report that should include a number of QA/QC results along with the environmental results. QA/QC sample results reported by the lab should include both analyses requested by the field crew (field blanks, field duplicates, lab duplicates and MS/MSD analysis), as well as internal laboratory QA/QC results (method blanks and laboratory control samples).

There are often differences among laboratories in terms of style and format of reporting. The data reviewer should verify that the laboratory data package includes the following items:

- A narrative that outlines any problems, corrections, anomalies, and conclusions.
- Sample identification numbers.
- Sample extraction and analysis dates.
- Reporting limits for all analyses reported.
- Results of method blanks.
- Results of matrix spike and matrix spike duplicate analyses, including calculation of percent recovered and relative percent differences.
- Results of laboratory control sample analyses.
- Results of external reference standard analyses.
- Surrogate spike and blank spike analysis results for organic constituents.
- A summary of acceptable QA/QC criteria (RPD, spike recovery) used by the laboratory.

Items missing from this list should be requested from the laboratory.

3. Check for typographical errors and apparent incongruities.

The laboratory reports should be reviewed to identify results that are outside the range of normally observed values. Any type of suspect result or apparent typographical error should be verified with the laboratory. An example of a unique value would be if a dissolved iron concentration has been reported lower than 500 mg/L for every storm event monitored at one location and then a value of 2500 mg/L is reported in a later event. This reported concentration of 2500 mg/L should be verified with the laboratory for correctness.

Besides apparent out-of-range values, the indicators of potential laboratory reporting problems include:

- Significant lack of agreement between analytical results reported for laboratory duplicates or field duplicates.
- Consistent reporting of dissolved metals results higher than total or total recoverable metals.
- Unusual numbers of detected values reported for blank sample analyses.
- Inconsistency in sample identification/labeling.

If the laboratory confirms a problem with the reported concentration, the corrected or recalculated result should be issued in an amended report, or if necessary the sample should be re-analyzed. If laboratory results are changed or other corrections are made by the laboratory, an amended laboratory report should be issued to update the project records.

Data Quality Evaluation

The data quality evaluation process is structured to provide systematic checks to ensure that the reported data accurately represent the concentrations of constituents actually present in stormwater. Data evaluation can often identify sources of contamination in the sampling and analytical processes, as well as detect deficiencies in the laboratory analyses or errors in data reporting. Data quality evaluation allows monitoring data to be used in the proper context with the appropriate level of confidence.

QA/QC parameters that should be reviewed are classified into the following categories:

- Reporting limits
- Holding times
- Contamination check results (method, field, trip, and equipment blanks)
- Precision analysis results (laboratory, field, and matrix spike duplicates)
- Accuracy analysis results (matrix spikes, surrogate spikes, laboratory control samples, and external reference standards)

Each of these QA/QC parameters should be compared to data quality acceptability criteria, and is also known as the project's data quality objectives (DQOs). The key steps that should be adhered to in the analysis of each of these QA/QC parameters are:

1. Compile a complete set of the QA/QC results for the parameter being analyzed.
2. Compare the laboratory QA/QC results to accepted criteria (DQOs).
3. Compile any out-of-range values and report them to the laboratory for verification.
4. Prepare a report that tabulates the success rate for each QA/QC parameter analyzed.

This process should be applied to each of the QA/QC parameters as discussed below.

Reporting Limits

Stormwater quality monitoring program DQOs should contain a list of acceptable reporting limits that the lab is contractually obligated to adhere to, except in special cases of insufficient sample volume or matrix interference problems. The reporting limits used should ensure a high probability of detection. Table 12-1 provides recommended reporting limits for selected parameters.

Holding Times

Holding time represents the elapsed time between sample collection time and sample analysis time. Calculate the elapsed time between the sampling time and start of analysis, and compare this to the required holding time. For composite samples that are collected within 24-hours or less, the time of the final sample aliquot is considered the "sample collection time" for determining sample holding time. For analytes with critical holding times (≤48 hours), composite samples lasting longer than 24-hours require multiple bottle composite samples. Each of these composite samples should represent less than 24 hours of monitored flow, and subsamples from the composites should have been poured off and analyzed by the laboratory for those constituents with critical holding times (see Section 12). It is important to review sample holding times to ensure that analyses occurred within the time period that is generally accepted to maintain stable parameter concentrations. Table 12-1 contains the holding times for selected parameters. If holding times are exceeded, inaccurate concentrations or false negative results may be reported.

Samples that exceed their holding time prior to analysis are qualified as "estimated", or may be rejected depending on the circumstances.

Contamination

Blank samples are used to identify the presence and potential source of sample contamination and are typically one of four types:

1. Method blanks are prepared and analyzed by the laboratory to identify laboratory contamination.
2. Field blanks are prepared by the field crew during sampling events and submitted to the laboratory to identify contamination occurring during the collection or the transport of environmental samples.
3. Equipment blanks are prepared by the field crew or laboratory prior to the monitoring season and used to identify contamination coming from sampling equipment (tubing, pumps, bailers, etc.).
4. Trip blanks are prepared by the laboratory, carried in the field, and then submitted to the laboratory to identify contamination in the transport and handling of volatile organics samples.
5. Filter blanks are prepared by field crew or lab technicians performing the sample filtration. Blank water is filtered in the same manner and at the same time as other environmental samples. Filter blanks are used to identify contamination from the filter or filtering process.

If no contamination is present, all blanks should be reported as "not detected" or "nondetect" (e.g., constituent concentrations should not be detected above the reporting limit). Blanks reporting detected concentrations ("hits") should be noted in the written QA/QC data summary prepared by the data reviewer. In the event that the laboratory reports hits on method blanks, a detailed review of raw laboratory data and procedures should be requested from the laboratory to identify any data reporting errors or contamination sources. When other types of blanks are reported above the reporting limit, a

similar review should be requested along with a complete review of field procedures and sample handling. Often-times it will also be necessary to refer to historical equipment blank results, corresponding method blank results, and field notes to identify contamination sources. This is a corrective and documentative step that should be done as soon as the hits are reported.

If the blank concentration exceeds the laboratory reporting limit, values reported for each associated environmental sample must be evaluated according to USEPA guidelines for data evaluations of organics and metals (USEPA, 1991; USEPA, 1995) as indicated in Table B-1.

Table B-1: USEPA Guidelines for Data Evaluation

Step	*Environmental Sample*	*Phthalates and other common contaminants*	*Other Organics*	*Metals*
1.	Sample > 10X blank concentration	No action	No action	No action
2.	Sample < 10X blank concentration	Report associated environmental results as "non-detect" at the reported environmental concentration.	No action	Results considered an "upper limit" of the true concentration (note contamination in data quality evaluation narrative).
3.	Sample < 5X blank concentration	Report associated environmental results as "non-detect" at the reported environmental concentration.	Report associated environmental results as "non-detect" at the reported environmental concentration.	Report associated environmental results as "non-detect" at the reported environmental concentration.

Specifically, if the concentration in the environmental sample is less than five times the concentration in the associated blank, the environmental sample result is considered, for reporting purposes, "not-detected" at the environmental sample result concentration (phthalate and other common contaminant results are considered non-detect if the environmental sample result is less than ten times the blank concentration). The laboratory reports are not altered in any way. The qualifications resulting from the data evaluation are made to the evaluator's data set for reporting and analysis purposes to account for the apparent contamination problem. For example, if dissolved copper is reported by the laboratory at 4 mg/L and an associated blank concentration for dissolved copper is reported at 1 mg/L, data qualification would be necessary. In the data reporting field of the database (see Section 14), the dissolved copper result would be reported as 4 mg/L), the numerical qualifier would be reported as "<", the reporting limit would be left as reported by the laboratory, and the value qualifier would be reported as "U" ("not detected above the reported environmental concentration").

When reported environmental concentrations are greater than five times (ten times for phthalates) the reported blank "hit" concentration, the environmental result is reported unqualified at the laboratory-reported concentration. For example, if dissolved copper is reported at 11 mg/L and an associated blank concentration for dissolved copper is reported at 1 mg/L, the dissolved copper result would still be reported as 11 mg/L.

Precision

Duplicate samples provide a measure of the data precision (reproducibility) attributable to sampling and analytical procedures. Precision can be calculated as the relative percent difference (RPD) in the following manner:

$$RPDi = 2 * |Oi - Di|/(Oi + Di) * 100\%$$

where:

RPDi = Relative percent difference for compound i

Oi = Value of compound i in original sample

Di = Value of compound i in duplicate sample

The resultant RPDs should be compared to the criteria specified in the project's DQOs. The DQO criteria shown in Table B-2 below are based on the analytical method specifications and laboratory-supplied values. Project-specific DQOs should be developed with consideration to the analytical laboratory, the analytical method specifications, and the project objective. Table B-2 should be used as a reference point as the least stringent set of criteria for monitoring projects.

Laboratory and Field Duplicates

Laboratory duplicates are samples that are split by the laboratory. Each half of the split sample is then analyzed and reported by the laboratory. A pair of field duplicates is two samples taken at the same time, in the same manner into two unique containers. Subsampling duplicates are two unique, ostensibly identical, samples taken from one composite bottle. Laboratory duplicate results provide information regarding the variability inherent in the analytical process, and the reproducibility of analytical results. Field duplicate analysis measures both field and laboratory precision, therefore, it is expected that field duplicate results would exhibit greater variability than lab duplicate results. Subsampling duplicates are used as a substitute for field duplicates in some situations and are also an indicator of the variability introduced by the splitting process.

The RPDs resulting from analysis of both laboratory and field duplicates should be reviewed during data evaluation. Deviations from the specified limits, and the effect on reported data, should be noted and commented upon by the data reviewer. Laboratories typically have their own set of maximum allowable RPDs for laboratory duplicates based on their analytical history. In most cases these values are more stringent than those listed in Table B-2. Note that the laboratory will only apply these maximum allowable RPDs to laboratory duplicates. In most cases field duplicates are submitted "blind" (with pseudonyms) to the laboratory.

Environmental samples associated with laboratory duplicate results greater than the maximum allowable RPD (when the numerical difference is greater than the reporting limit) are qualified as "J" (estimated). When the numerical difference is less than the RL, no qualification is necessary. Field duplicate RPDs are compared against the maximum allowable RPDs used for laboratory duplicates to identify any pattern of problems with reproducibility of results. Any significant pattern of RPD exceedances for field duplicates should be noted in the data report narrative.

Corrective action should be taken to address field or laboratory procedures that are introducing the imprecision of results. The data reviewer can apply "J" (estimated) qualifiers to any data points if there is clear evidence of a field or laboratory bias issue that is not related to contamination. (Qualification based on contamination is assessed with blank samples.)

Laboratories should provide justification for any laboratory duplicate samples with RPDs greater than the maximum allowable value. In some cases, the laboratory will track and document such exceedances, however; in most cases it is the job of the data reviewer to locate these out-of-range RPDs. When asked to justify excessive RPD values for field duplicates, laboratories most often will cite sample splitting problems in the field. Irregularities should be included in the data reviewer's summary, and the

laboratory's response should be retained to document laboratory performance, and to track poten tial chronic problems with laboratory analysis and reporting.

Accuracy

Accuracy is defined as the degree of agreement of a measurement to an accepted reference or true value. Accuracy is measured as the percent recovery (%R) of spike compound(s).

Percent recovery of spikes is calculated in the following manner:

$$\%R = 100\% * [(Cs - C) / S]$$

where:

%R = percent recovery

Cs = spiked sample concentration

C = sample concentration for spiked matrices

S = concentration equivalent of spike added

Accuracy (%R) criteria for spike recoveries should be compared with the limits specified in the project DQOs. A list of typical acceptable recoveries is shown in Table B-2. As in the case of maximum allowable RPDs, laboratories develop acceptable criteria for an allowable range of recovery percentages that may differ from the values listed in Table B-2.

Percent recoveries should be reviewed during data evaluation, and deviations from the specified limits should be noted in the data reviewer's summary. Justification for out of range recoveries should be provided by the laboratory along with the laboratory reports, or in response to the data reviewer's summary.

Laboratory Matrix Spike and Matrix Spike Duplicate Samples

Evaluation of analytical accuracy and precision in environmental sample matrices is obtained through the analysis of laboratory matrix spike (MS) and matrix spike duplicate (MSD) samples. A matrix spike is an environmental sample that is spiked with a known amount of the constituent being analyzed. A percent recovery can be calculated from the results of the spike analysis. A MSD is a duplicate of this analysis that is performed as a check on matrix recovery precision. MS and MSD results are used together to calculate RPD as with the duplicate samples. When MS/MSD results (%R and RPD) are outside the project specifications, as listed in Table B-2, the associated environmental samples are qualified as "estimates due to matrix interference". Surrogate standards are added to all environmental and QC samples tested by gas chromatography (GC) or gas chromatography-mass spectroscopy (GC-MS). Surrogates are non-target compounds that are analytically similar to the analytes of interest. The surrogate compounds are spiked into the sample prior to the extraction or analysis. Surr ogate recoveries are evaluated with respect to the laboratory acceptance criteria to provide information on the extraction efficiency of every sample.

External Reference Standards

External reference standards (ERS) are artificial certified standards prepared by an external agency and added to a batch of samples. ERS's are not required for every batch of samples, and are often only run quarterly by laboratories. Some laboratories use ERS's in place of laboratory control spikes with every batch of samples. ERS results are assessed the same as laboratory control spikes for qualification purposes (see below). The external reference standards are evaluated in terms of accuracy, expressed as the percent recovery (comparison of the laboratory results with the certi fied concentrations). The laboratory should report all out-of-range values along with the environmental sample results. ERS values are qualified as biased high" when the ERS recovery exceeds the acceptable recovery range and "biased low" when the ERS recovery is smaller than the recovery range.

Laboratory Control Samples

LCS analysis is another batch check of recovery of a known standard solution that is used to assess the accuracy of the entire recovery process. LCSs are much like ERS's except that a certified standard is not necessarily used with LCSs, and the sample is prepared internally by the laboratory so the cost associated with preparing a LCS sample is much lower than the cost of ERS preparation. LCSs are reviewed for percent recovery within control limits provided by the laboratory. LCS out-of-range values are treated in the same manner as ERS out-of-range values. Because LCS and ERS analysis both check the entire recovery process, any irregularity in these results supersedes other accuracy-related qualification. Data are rejected due to low LCS recoveries when the associated environmental result is below the reporting limit.

A flow chart of the data evaluation process, presented on the following pages as Figures B-1 (lab-initiated QA/QC samples) and B-2 (field-initiated QA/QC), can be used as a general guideline for data evaluation. Boxes shaded black in Figures B-1 and B-2 designate final results of the QA/QC evaluation.

Table B-2: Quality Control Requirements

Quality Control Sample Type	QA Parameter	Frequency[1]	Acceptance Limits	Corrective Action
Quality Control Requirements – Field				
Equipment Blanks	Contamination	5% of all samples[2]	<MDL	Identify equipment contamination source. Qualify data as needed.
Field Blank	Contamination	5% of all samples	<MDL	Examine field log. Identify contamination source. Qualify data as needed.
Field Duplicate	Precision	5% of all samples	RPD < 25% if |Difference| > RL	Reanalyze both samples if possible. Identify variability source. Qualify data as needed.
Quality Control Requirements – Laboratory				
Method Blank	Contamination	1 per analytical batch	< MDL	Identify contamination source. Reanalyze method blank and all samples in batch. Qualify data as needed.
Lab Duplicate	Precision	1 per analytical batch	RPD < 25% if |Difference| > RL	Recalibrate and reanalyze.
Matrix Spike	Accuracy	1 per analytical batch	80-120% recovery for GWQC 75-125% for Metals 50-150% Recovery for Pesticides [3]	Check LCS/CRM recovery. Attempt to correct matrix problem and reanalyze samples. Qualify data as needed.
Matrix Spike Duplicate	Precision	1 per analytical batch	RPD < 30% if |Difference| > RL	Check lab duplicate RPD. Attempt to correct matrix interference and reanalyze samples. Qualify data as needed.
Laboratory Control Sample (or CRM or Blank Spike)	Accuracy	1 per analytical batch	80-120% Recovery for GWQC 75-125% for Metals 50-150% Recovery for Pesticides [3]	Recalibrate and reanalyze LCS/ CRM and samples.
Blank Spike Duplicate	Precision	1 per analytical batch	RPD < 25% if |Difference| > RL	Check lab duplicate RPD. Attempt to correct matrix problem and reanalyze samples. Qualify data as needed.
Surrogate Spike (Organics Only)	Accuracy	Each environmental and lab QC sample	30-150% Recovery3	Check surrogate recovery in LCS. Attempt to correct matrix problem and reanalyze sample. Qualify data as needed.

MDL = Method Detection Limit RL = Reporting Limit RPD = Relative Percent Difference

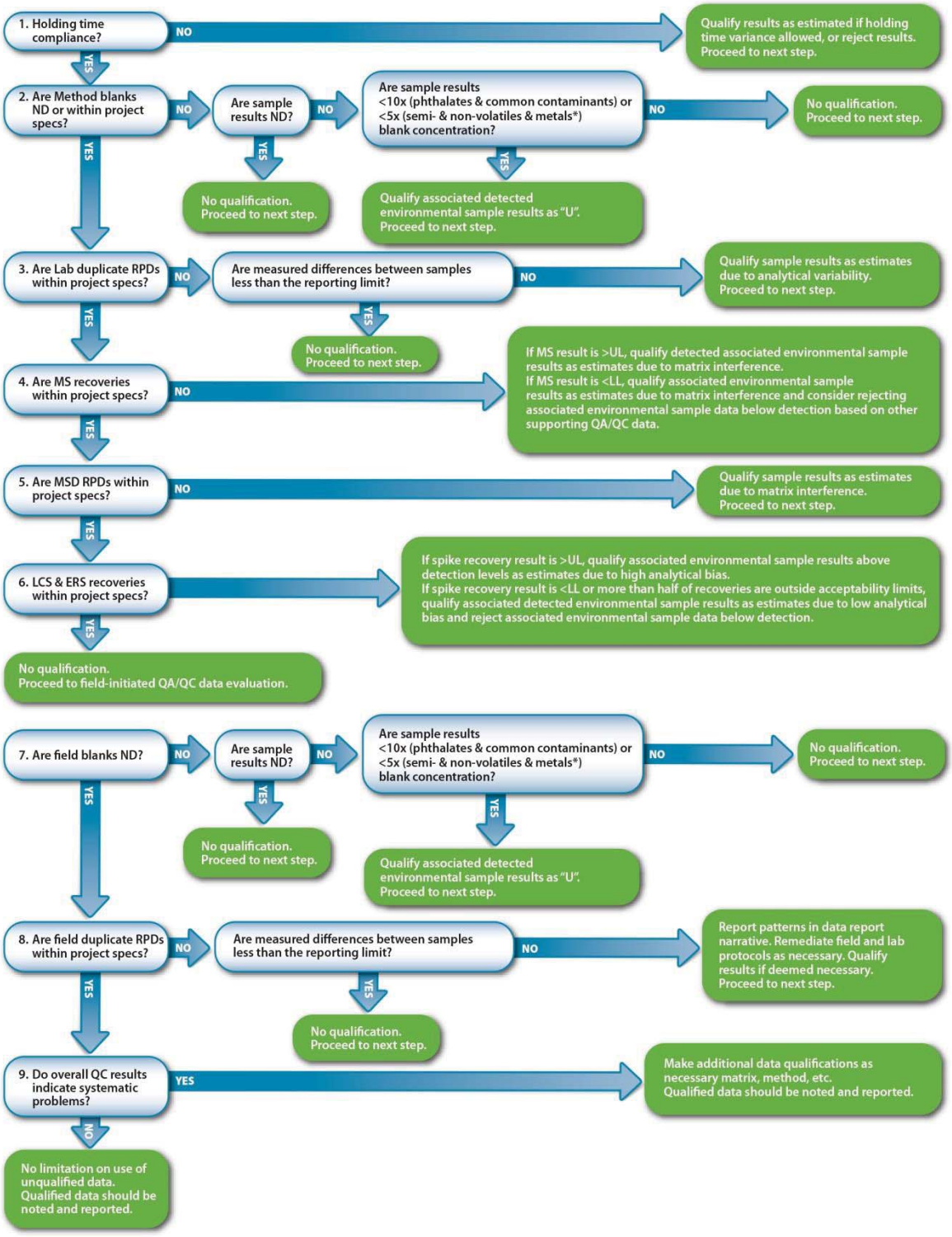
LCS = Laboratory Control Sample/Standard CRM = Certified/Standard Reference Material

GWQC = General Water Quality Constituents

"Analytical batch" refers to a number of samples (not to exceed 20 environmental samples plus the associated quality control samples) that are similar in matrix type and processed/prepared together under the same conditions and same reagents (equivalent to preparation batch).

Equipment blanks will be collected by the field crew before using the equipment to collect sample.

Or control limits set at +3 standard deviations based on actual laboratory data.



*Environmental results between 5x and 10x the blank concentration are qualified as "an upper limit on the true concentration" and the data user should be cautioned.

Figure B-1: Technical Data Evaluation for Lab- and Field-Initiated QA/QC Samples

Appendix C – Analytical Method Requirements and Water Quality Objectives for Constituents

Table C-1: Analytical Method Requirements and Water Quality Objectives for Constituents

(Listed in MRP Table E-2)

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
CONVENTIONAL POLLUTANTS								
Oil and Grease	5	mg/L	EPA 1664A SM 5520 B	28 d	G / Cool, ≤ 6 °C, HCl, H_2SO_4, or H_3PO_4 to pH < 2	Basin Plan	Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.	
Total Phenols	100	µg/L	EPA 420.1 SM 5530 D	28 d	G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	CTR Human Health Protection (Sources of Drinking water)	21,000	µg/L
Cyanide (Total)	5	µg/L	SM 4500 CN F ASTM D7511	14 d	P, FP, G / Cool, ≤ 6 °C, NaOH to pH > 10, reducing agent if oxidizer present	NSWAL[5] Malibu Creek WMA[6] Average Monthly	4.3	µg/L
						NSWAL Malibu Creek WMA Daily Maximum	8.3	µg/L
						Basin Plan	200	µg/L
						CTR Freshwater (1 hr avg.)	22	µg/L

[4] "P" is for polyethylene; "FP" is fluoropolymer (polytetrafluoroethylene (PTFE); Teflon®), or other fluoropolymer, "G" is glass; "PA" is any plastic that is made of a sterilizable material (polypropylene or other autoclavable plastic); "LDPE" is low density polyethylene.
[5] NSWAL: Non-Storm Water Action Level as defined by Los Angeles County Permit Order No. R4-2012-0175 Attachment G.
[6] WMA = Watershed Management Area

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
						CTR Freshwater (4 day avg.)	5.2	µg/L
pH	0 - 14	N/A	Field (EPA 150.2) SM 4500 H B	Field (15 m)	P, FP, G / Cool, ≤ 6 °C	MS4 MAL[7]	7.7	pH
						Basin Plan	The pH of inland surface waters shall not be depressed below 6. 5 or raised above 8. 5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0. 5 units from natural conditions as a result of waste discharge. The pH of bays or estuaries shall not be depressed below 6. 5 or raised above 8. 5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0. 2 units from natural conditions as a result of waste discharge.	
Temperature	None	°F	SM 2550 B	Field (15 minutes)	P, FP, G / None	Basin Plan	The natural receiving water temperature of all regional waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. Alterations that are allowed must meet the requirements below . For waters designated WARM, water temperature shall not be altered by more than 5 °F above the natural temperature. At no time shall these WARM designated waters be raised above 80 °F as a result of waste discharges. For waters designated COLD, water temperature shall not be altered by more than 5 °F above the natural temperature.	

[7] MAL = Municipal Action Level as defined by Los Angeles County Permit Order No. R4-2012-0175 Attachment G.

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
Dissolved Oxygen	Sensitivity to 5 mg/L	mg/L	Field SM 4500 O G	Field (15 m)	G, Bottle and top / None	Basin Plan	At a minimum (see specifics below), the mean annual dissolved oxygen concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations. The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges. The dissolved oxygen content of all surface waters designated as COLD shall not be depressed below 6 mg/L as a result of waste discharges. The dissolved oxygen content of all surface waters designated as both COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.	
BACTERIA (single sample limits)								
Fecal coliform (fresh waters)	20	MPN/100 ml	SM 9221 C E	8 h	PA, G / Cool < 10 °C, 0.0008% $Na_2S_2O_3$	SMB Beaches and Malibu Creek & Lagoon TMDL (daily maximum)	400	MPN/100mL
						SMB Beaches and Malibu Creek & Lagoon TMDL (geometric mean)	200	MPN/100mL
						Basin Plan (Total Coliform over 7 day period)	1.1	MPN/100mL
E. coli (fresh waters)	1	MPN/100 ml	SM 9221 F	8 h	PA, G / Cool < 10 °C, 0.0008% $Na_2S_2O_3$	NSWAL Malibu Creek WMA, Malibu Creek TMDL (daily maximum)	235	MPN/100mL
						NSWAL Malibu Creek WMA (geometric mean)	126	MPN/100mL

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
GENERAL CONSTITUENTS								
Dissolved Phosphorus[8]	0.05	mg/L	EPA 365.3	28 d	P / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	Basin Plan	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	
Total Phosphorus	0.05	mg/L	SM 3120 B EPA 365.1	28d	G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	MS4 MAL	0.80	mg/L
						Malibu Creek & Lagoon TMDL WLA[9] (summer)	0.1	mg/L
						Malibu Creek & Lagoon TMDL WLA (winter)	0.2	mg/L
						Malibu Creek Watershed Nutrients TMDL RWL (Summer daily maximum)	0.8 (based on 0.1 numeric target)	lbs/day
Turbidity	0.1	NTU	EPA 180.1 SM 2130 B	48 h	P, FP, G / Cool, ≤ 6 °C	Basin Plan	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%. Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%. Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific Waste Discharge Requirements.	
Total Suspended Solids (TSS)	2	mg/L	SM 2540 D	7 d	P, FP, G / Cool, ≤ 6 °C	Basin Plan	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	

[8] All dissolved constituents must be filtered upon arrival at analysis laboratory as the official US EPA holding time is 15 minutes.

[9] WLA = Waste Load Allocation

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
						MS4 MAL	264.1	mg/L
Suspended Sediment Concentration (SSC) – For Malibu Creek Only (TMDL)	0.5	mg/L	ASTM D-3977-97	7 d	P, G / Cool to ≤6° C, store in the dark	Basin Plan	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	
Total Dissolved Solids (TDS)	2	mg/L	SM 2540 C	7 d	P, FP, G / Cool, ≤ 6 °C	Basin Plan – Malibu Creek Watershed (Table 3-8)	2,000	mg/L
						USEPA Secondary MCL	500	mg/L
						CA Dept. Public Health Recommended Upper Level	1,000	mg/L
						CA Dept. Public Health Recommended Short-term Level	1,500	mg/L
Volatile Suspended Solids (VSS)	2	mg/L	SM 2540 E EPA 160.4	7 d	P, FP, G / Cool, ≤ 6 °C	Basin Plan	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.	
Sulfate	0.50	mg/L	EPA 300.0	28 d	P, FP, G / Cool, ≤ 6 °C	Basin Plan – Malibu Creek (Table 3-8)	500	mg/L
Total Organic Carbon (TOC)	1	mg/L	SM 5310C	28 d	P, FP, G / Cool, ≤ 6 °C, HCl, H_2SO_4, or H_3PO_4 to pH < 2	None	None	N/A
Total Petroleum Hydrocarbons (extractable fraction, i.e., diesel and motor oil range hydrocarbons)	5	mg/L	EPA 8015B	14 d to ext. / 40 d to analyze	G / Cool, ≤ 6 °C	None	None	none
Biochemical Oxygen Demand	2	mg/L	5210 B	48 h	P, FP, G / Cool, ≤ 6 °C	Basin Plan	Waters shall be free of substances that result in increases in the BOD which adversely affect beneficial uses.	
Chemical Oxygen Demand	20-900	mg/L	EPA 410.4 SM 5220 D	28 d	P, FP, G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	MAL	247.5	mg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
Total Ammonia-Nitrogen (NH_3-N)	0.1	mg/L	EPA 350.1	28 d	P, FP, G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	Basin Plan	Varies based on pH and temperature for Cold waters and Warm Waters (Table 3-1 to 3-4 of Basin Plan)	
Total Kjeldahl Nitrogen (TKN)	0.1	mg/L	EPA 351.2	28 d	P, FP, G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	MS4 MAL	4.59	mg/L
Nitrate+Nitrite (NO_2+NO_3 as N)	0.1	mg/L	EPA 300.0	28 d	P, FP, G / Cool, ≤ 6 °C, H_2SO_4 to pH < 2	MS4 MAL	1.85	mg/L
						Basin Plan	10 as NO_3-N + NO_2-N	mg/L
						Basin Plan – Malibu Creek	10 as NO_3-N + NO_2-N	mg/L
						Malibu Creek Watershed Nutrients TMDL (summer daily maximum)	8 (based on 1.0 mg/L numeric target)	lbs/day
						Malibu Creek Watershed Nutrients TMDL (winter daily maximum)	8	mg/L
Total Nitrogen (TKN+ NO_2-N+NO_3-N)	N/A		Sum of TKN, Nitrate, and Nitrite	N/A	N/A	Malibu Creek & Lagoon Benthic TMDL (summer)	0.65	mg/L
						Malibu Creek & Lagoon Benthic TMDL (winter)	4.0	mg/L
Alkalinity	2	mg/L	EPA 310.2 SM 2320B	14 d	P, FP, G / Cool, ≤ 6 °C	USEPA National Recommended Water Quality Criteria (Freshwater)	20,000	ug/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
Specific Conductance	1	umho/cm	EPA 120.1 SM 2510B	Field (15 min) Lab 28 d	P, FP, G / Cool, ≤ 6 °C	CA Dept. Public Health Secondary MCL	900	µmhos/cm
Total Hardness (as $CaCO_3$)	2	mg/L	EPA 130.1	6 mo	HNO_3 to pH < 2	None	None	N/A
Methylene Blue Active Substances (MBAS)	500	µg/L	SM 5540 C	48 h	P, FP, G / Cool, ≤ 6 °C	CA Dept. Public Health Secondary MCL	500	µg/L
						Basin Plan Federal MCL	500	µg/L
Chloride	2	mg/L	EPA 300.0 SM 4110B	28 d	P, FP, G / None	Basin Plan – Malibu Creek	500	mg/L
Fluoride	100	µg/L	EPA 300.0 SM 4110B	28 d	P / None	CA Dept. Public Health MCL (drinking water)	2,000	µg/L
						Basin Plan	Varies with Temperature (Table 3-6)	µg/L
Methyl tertiary butyl ether (MTBE)	1000	µg/L	EPA 624	7	G, FP-lined septum / Cool ≤ 6 °C, 0.008% $Na_2S_2O_3$	CA Dept. Public Health MCL (drinking water)	13	µg/L
						CA Dept. Public Health Secondary MCL	5	µg/L
Perchlorate	4	µg/L	EPA 314.0	28	P / None	CA Dept. Public Health MCL (drinking water)	6	µg/L
METALS (TOTAL & DISSOLVED[10] FRACTIONS)			EPA 200.8 SM 3125B	6 mo	P, FP, G / HNO_3 to pH < 2, or at least 24 hours prior to analysis			
Aluminum	100	µg/L	--	--	--	Basin Plan MCL	1,000	µg/L

[10] All dissolved constituents must be filtered upon arrival at analysis laboratory. The official US EPA holding time is 15 minutes.

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
						USDFG[11] (4 d)	87	µg/L
						USDFG (1 hr)	750	µg/L
Antimony	0.5	µg/L	--	--	--	Basin Plan MCL	6	µg/L
Arsenic	1	µg/L	--	--	--	Basin Plan MCL	50	µg/L
						CTR Freshwater (1 hr avg.) dissolved	340	µg/L
						CTR Freshwater (4 day avg.) dissolved	150	µg/L
Beryllium	0.5	µg/L	--	--	--	Basin Plan MCL	4	µg/L
Cadmium	0.25	µg/L	--	--	--	MS4 MAL	2.52	µg/L
						Basin Plan MCL	5	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(1.128*LN(Hardness)-3.6867))	µg/L
						CTR Freshwater (1 hr avg.) dissolved	=(EXP(1.128*LN(Hardness)-3.6867)) *(1.136672-(LN(Hardness)*0.041838))	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(0.7852*LN(Hardness)-2.715))	µg/L
						CTR Freshwater (4 day avg.) dissolved	=(EXP(0.7852*LN(Hardness)-2.715)) * (1.101672-(LN(Hardness)*0.041838))	µg/L
Chromium	0.5	µg/L	--	--	--	MS4 MAL	20.20	µg/L
						Basin Plan MCL	50	µg/L

[11] US Department of Fish and Game

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
Chromium (Hexavalent)	5	µg/L	EPA 218.6	28 d	P, FP, G / Cool, ≤ 6 °C, $(NH_4)_2SO_4$ / NH_4OH, pH = 9.3-9.7	CTR Freshwater (1 hr avg.) dissolved	16	µg/L
						CTR Freshwater (4 day avg.) dissolved	11	µg/L
Copper	0.5	µg/L	--	--	--	MS4 MAL (Total Fraction)	71.12	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(0.9422*LN(Hardness)-1.7))	µg/L
						CTR Freshwater (1 hr avg.) dissolved	=(EXP(0.9422*LN(Hardness)-1.7))*(0.96)	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(0.8545*LN(Hardness)-1.702))	µg/L
						CTR Freshwater (4 day avg.) dissolved	=(EXP(0.8545*LN(Hardness)-1.702))*(0.96)	µg/L
Iron	100,	µg/L	--	--	--	CA Dept. Public Health Secondary MCL	300	µg/L
Lead	0.5	µg/L	--	--	--	MS4 MAL	102.00	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(1.273*LN(Hardness)-1.46))	µg/L
						CTR Freshwater (1 hr avg.) dissolved	=(EXP(1.273*LN(Hardness)-1.46))*(1.46203-(LN(Hardness)*0.145712))	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(1.273*LN(Hardness)-4.705))	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
						CTR Freshwater (4 day avg.) dissolved	=(EXP(1.273*LN(Hardness)-4.705))*(1.46203-(LN(Hardness)*0.145712))	µg/L
Nickel	1	µg/L	--	--	--	MS4 MAL	27.43	µg/L
						Basin Plan MCL	100	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(0.846*LN(Hardness)+2.255))	µg/L
						CTR Freshwater (1 hr avg.) dissolved	=(EXP(0.846*LN(Hardness)+2.255))*(0.998)	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(0.846*LN(Hardness)+0.0584))	µg/L
						CTR Freshwater (4 day avg.) dissolved	=(EXP(0.846*LN(Hardness)+0.0584))*(0.997)	µg/L
Selenium	1	µg/L	--	--	--	NSWAL Malibu Creek WMA Daily Maximum	8.2	µg/L
						NSWAL Malibu Creek WMA Average Monthly	4.1	µg/L
						Basin Plan MCL	50	µg/L
						CTR Freshwater (1 hr avg.) total	20	µg/L
						CTR Freshwater (4 day avg.) total	5.0	µg/L
Silver	0.25	µg/L	--	--	--	CTR Freshwater (max instant.) (total silver)	=(EXP(1.72*LN(Hardness)-6.59))	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
Thallium	1	µg/L	--	--	--	Basin Plan MCL	2	µg/L
Zinc	1	µg/L	--	--	--	MS4 MAL	641.3	µg/L
						CTR Freshwater (1 hr avg.) total	=(EXP(0.8473*LN(Hardness)+0.884))	µg/L
						CTR Freshwater (1 hr avg.) dissolved	=(EXP(0.8473*LN(Hardness)+0.884))*(0.978)	µg/L
						CTR Freshwater (4 day avg.) total	=(EXP(0.8473*LN(Hardness)+0.884))	µg/L
						CTR Freshwater (4 day avg.) dissolved	=(EXP(0.8473*LN(Hardness)+0.884))*(0.986)	µg/L
Total & Dissolved[12] Mercury	0.5	µg/L	EPA Method 245.7 or 1631E	90 d	FP, G, and FP-lined cap / 5 mL/L 12N HCl or 5 mL/L BrCl	NSWAL	0.051	µg/L
						MS4 MAL	0.32	µg/L
						Basin Plan MCL	2	µg/L
						CTR Human Health Protection (30-d avg; fish consumption only)	0.051	µg/L
VOLATILE ORGANIC COMPOUNDS								
2-Chloroethyl vinyl ether[13]	1	µg/L	624[2]	7 d	G, FP-lined septum / Cool ≤ 6 °C, 0.008% $Na_2S_2O_3$	None	None	µg/L

[12] All dissolved constituents must be filtered upon arrival at analysis laboratory. The official US EPA holding time is 15 minutes.

[13] Permit MRP Table E-2 lists 2-Chloroethyl vinyl ether as a base/neutral semi-volatile organic compound.

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
SEMIVOLATILE ORGANIC COMPOUNDS			EPA 625 SM 6410 B	7 d to ext. / 40 d to analyze	G, FP-lined cap / Cool ≤ 6 °C, 0.008% $Na_2S_2O_3$			
ACID COMPOUNDS								
2-Chlorophenol	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	120	µg/L
4-Chloro-3-methylphenol	1	µg/L	--	--	--	USEPA National Recommended Water Quality Criteria (Taste & Odor)	3,000	µg/L
2,4-Dichlorophenol	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	93	µg/L
2,4-Dimethylphenol	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	540	µg/L
2,4-Dinitrophenol	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	70	µg/L
2-Nitrophenol	10	µg/L	--	--	--	None	None	N/A
4-Nitrophenol	5	µg/L	--	--	--	None	None	N/A
Pentachlorophenol	2	µg/L	--	--	--	CTR Fresh Water (4 day avg.)	=EXP(1.005*pH-5.134)	µg/L
						CTR Freshwater (1 hr avg.)	=EXP(1.005*pH-4.869)	µg/L
Phenol	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	21,000	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
2,4,6-Trichlorophenol	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	2.1	µg/L
BASE/NEUTRAL COMPOUNDS								
Acenaphthene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1,200	µg/L
Acenaphthylene	2	µg/L	--	--	--	None	None	N/A
Anthracene	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	9,600	µg/L
Benzidine	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.00012	µg/L
1,2 Benzanthracene	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L
Benzo(a)pyrene	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L
						Basin Plan Federal MCL	0.2	µg/L
Benzo(g,h,i)perylene	5	µg/L	--	--	--	None	None	N/A
3,4 Benzoflouranthene	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
Benzo(k)flouranthene	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	0.0044	µg/L
Bis(2-Chloroethoxy) methane	5	µg/L	--	--	--	None	None	N/A
Bis(2-Chloroisopropyl) ether	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	1,400	µg/L
Bis(2-Chloroethyl) ether	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	0.031	µg/L
Bis(2-Ethylhexl) phthalate	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	1.8	µg/L
4-Bromophenyl phenyl ether	5	µg/L	--	--	--	None	None	N/A
Butyl benzyl phthalate	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	3,000	µg/L
2-Chloronaphthalene	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	1700	µg/L
4-Chlorophenyl phenyl ether	5	µg/L	--	--	--	None	None	N/A
Chrysene	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	0.0044	µg/L
Dibenzo(a,h)anthracene	0.1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	0.0044	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
1,3-Dichlorobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	400	µg/L
1,4-Dichlorobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	400	µg/L
						Basin Plan Federal MCL	5	µg/L
1,2-Dichlorobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	2,700	µg/L
						Basin Plan Federal MCL	600	µg/L
3,3-Dichlorobenzidine	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.04	µg/L
Diethyl phthalate	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	23,000	µg/L
Dimethyl phthalate	2	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	313,000	µg/L
Di-n-Butyl phthalate	10	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	2,700	µg/L
2,4-Dinitrotoluene	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.11	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
2,6-Dinitrotoluene	5	µg/L	--	--	--	USEPA Toxicity LOEL	330 (acute) 230 (chronic)	µg/L
4,6 Dinitro-2-methylphenol	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	13.4	µg/L
1,2-Diphenylhydrazine	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.04	µg/L
Di-n-Octyl phthalate	10	µg/L	--	--	--	USEPA Toxicity LOEL	940 acute 3 chronic	µg/L
Fluoranthene	0.05	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	300	µg/L
Fluorene	0.1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1,300	µg/L
Hexachlorobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.00075	µg/L
						Basin Plan Federal MCL	1	µg/L
Hexachlorobutadiene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.44	µg/L
Hexachloro-cyclopentadiene	5	µg/L	--	--	--	CA Dept. Public Health MCL (drinking water)	50	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
						CTR Human Health Protection (Sources of Drinking water)	240	µg/L
						Basin Plan Federal MCL	50	µg/L
Hexachloroethane	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	1.9	µg/L
Indeno(1,2,3-cd)pyrene	0.05	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0044	µg/L
Isophorone	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	8.4	µg/L
Naphthalene	0.2	µg/L	--	--	--	USEPA Toxicity LOEL	2300 acute 620 chronic	µg/L
Nitrobenzene	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	17	µg/L
N-Nitroso-dimethyl amine	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.00069	µg/L
N-Nitroso-diphenyl amine	1	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	5.0	µg/L
N-Nitroso-di-n-propyl amine	5	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.005	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
Phenanthrene	0.05	µg/L	--	--	--	None	None	N/A
Pyrene	0.05	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	960	µg/L
1,2,4-Trichlorobenzene	1	µg/L	--	--	--	CA Dept. Public Health MCL (drinking water)	5	µg/L
						Basin Plan Federal MCL	70	µg/L
CHLORINATED PESTICIDES			EPA 608	7 d to ext. / 40 d to analyze	G, FP-lined cap / Cool ≤ 6 °C, pH 5-9, 0.008% $Na_2S_2O_3$			
Aldrin	0.005	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.00013	µg/L
alpha-BHC	0.01	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.0039	µg/L
beta-BHC	0.005	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking water)	0.014	µg/L
delta-BHC	0.005	µg/L	--	--	--	None	None	N/A
gamma-BHC (lindane)	0.02	µg/L	--	--	--	CTR Freshwater (1 hr avg.)	0.95	µg/L
						Basin Plan Federal MCL	0.2	µg/L
alpha-chlordane	0.1	µg/L	--	--	--	Basin Plan Federal MCL	0.1	µg/L
gamma-chlordane	0.1	µg/L	--	--	--	Basin Plan Federal MCL	0.1	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
4,4'-DDD	0.05	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	0.00083	µg/L
4,4'-DDE	0.05	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	0.00059	µg/L
4,4'-DDT	0.01	µg/L	--	--	--	CTR Freshw ater (4 day avg.)	0.001	µg/L
						CTR Freshw ater (1 hr avg.)	1.1	
Dieldrin	0.01	µg/L	--	--	--	CTR Freshw ater (4 day avg.)	0.056	µg/L
						CTR Freshw ater (1 hr avg.)	0.24	µg/L
alpha-Endosulfan	0.02	µg/L	--	--	--	CTR Freshw ater (4 day avg.)	0.056	µg/L
						CTR Freshw ater (max instant.)	0.22	µg/L
beta-Endosulfan	0.01	µg/L	--	--	--	CTR Freshw ater (4 day avg.)	0.056	µg/L
						CTR Fresh Water (max instant.)	0.22	µg/L
Endosulfan sulfate	0.05	µg/L	--	--	--	USEPA 24 hr avg	0.056	µg/L
Endrin	0.01	µg/L	--	--	--	CTR Freshw ater (4 day avg.)	0.036	µg/L
						CTR Freshw ater (1 hr avg.)	0.086	µg/L

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
						Basin Plan Federal MCL	2	µg/L
Endrin aldehyde	0.01	µg/L	--	--	--	CTR Human Health Protection (Sources of Drinking w ater)	0.76	µg/L
Heptachlor	0.01	µg/L	--	--	--	CTR Freshw ater (4 day avg.)	0.0038	µg/L
						CTR Fresh Water (max instant.)	0.52	µg/L
						Basin Plan Federal MCL	.01	µg/L
Heptachlor epoxide	0.01	µg/L	--	--	--	CTR Freshw ater (4 day avg.)	0.0038	µg/L
						CTR Freshw ater (max instant.)	0.52	µg/L
						Basin Plan Federal MCL	.01	µg/L
Toxaphene	0.5	µg/L	--	--	--	CTR Freshw ater (4 day avg.)	0.0002	µg/L
						CTR Freshw ater (1 hr avg.)	0.73	µg/L
						Basin Plan Federal MCL	3	µg/L
POLYCHLORINATED BIPHENYLS								

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
Aqueous PCBs summation of a minimum of 40 (and preferably at least 50) congeners and Aroclors as specified in Table E-2 of the MS4 Permit	0.2	ng/g	EPA Methods 8270 or 1668C (as appropriate), and High Resolution Mass Spectrometry[14]			SWAMP Quality Assurance Program Plan	0.2	ng/L
SUSPENDED SEDIMENT								
DDTs	--	--	EPA Method 1699	--	--	SMB DDT/PCB TMDL Max Allowable WLA	112	g/yr
						SMB DDT/PCB TMDL Allowable WLA	0.76	g/yr
PCBs	--	--	EPA Method 1668c	--	--	SMB DDT/PCB TMDL Max Allowable WLA	34	g/yr
						SMB DDT/PCB TMDL Allowable WLA	3.9	g/yr
ORGANOPHOSPHATE PESTICIDES			EPA 525.2	7 d to ext. / 40 d to analyze	G, FP-lined cap / Cool ≤ 6 °C, pH 5-9			
Atrazine	2	µg/L	--	--	--	CA Dept. Public Health MCL (drinking water)	1	µg/L
						Basin Plan Federal MCL	3	µg/L
Chlorpyrifos	0.05	µg/L	--	--	--	CADFG Freshwater Aquatic Life (4 day Avg)	0.014	µg/L

[14] If results after year 1 indicate that a less sensitive method will provide definitive and interpretable PCB results under each condition (wet and dry), a less costly method may be used for subsequent sample events. Notification of a change in analytical methods will be provided to the Regional Water Board in advance.

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
						CADFG Freshwater Aquatic Life (1 hr maximum)	0.02	µg/L
Cyanazine	2	µg/L	EPA 629 / 507	--	--	None	None	N/A
Diazinon	0.01	µg/L	--	--	--	CADFG Freshwater Aquatic Life (4 day Avg)	0.05	µg/L
						CADFG Freshwater Aquatic Life (1 hr maximum)	0.08	µg/L
Malathion	1	µg/L	--	--	--	USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life (max instant.)	0.1	µg/L
Prometryn	2	µg/L	--	--	--	None	None	N/A
Simazine	2	µg/L	--	--	--	CA Dept. Public Health MCL (drinking water)	4	µg/L
						Basin Plan Federal MCL	4	µg/L
						USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life (max instant.)	10	µg/L
HERBICIDES				7 d to ext. / 40 d to analyze	G, FP-lined cap **/** Cool ≤ 6 °C, pH 5-9			

Constituent	Minimum Level (Permit Table E-2)		Analytical Methods	Analysis Holding Time (Max)	Container Type[4] / Preservative	Reference Thresholds		
	Value	Units				Source	Value	Units
2,4-D	10	µg/L	EPA 615 SM 6640B	--	--	CA Dept. Public Health MCL (drinking water)	70	µg/L
						Basin Plan Federal MCL	70	µg/L
Glyphosate	5	µg/L	EPA 547	--	--	CA Dept. Public Health MCL (drinking water)	700	µg/L
2,4,5-TP-SILVEX	0.5	µg/L	EPA 615 SM 6640B	--	--	USEPA National Recommended Water Quality Criteria for Human Health	10	µg/L
						Basin Plan Federal MCL	50	µg/L

Data Sources:

Los Angeles County Permit Order No. R4-2012-0175

USEPA Santa Monica Bay TMDL for DDTs and PCBs (March 2012)

Los Angeles Region Basin Plan CH. 3 Water Quality Objectives (1994)

State Water Resources Control Board Online Water Quality Goals Database: (http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/search.shtml)

USEPA Federal Register Vol. 77, No. 97, Part II. Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures (May 2012)

Quality Assurance Program Plan (QAPP), The State of California's Surface Water Ambient Monitoring Program (SWAMP) (September 2008

Appendix D – Trash Monitoring Worksheets

Malibu Creek Watershed Trash Assessment Worksheet

Watershed/Stream:	**Date:**	**Start Time:**
Monitoring Staff:	**Site ID:**	**End Time:**
Total Pieces In Stream:	**Total Pieces On Banks:**	**Grand Total Trash:**
Volume (# trash bags):	**Weight (lbs): In Stream- On Banks-**	**Total Weight Outside Site (lbs):**
Width Right Bank (ft):	**Width Left Bank (ft):**	**Photo #'s (from camera)**
Dumped %	**Hazardous Waste Log (Y/N)**	**Intractable Trash Log (Y/N)**

Plastic/ Styrofoam:	**# in Stream:**	**# on Banks:**		**Source I.D.**	**% Algae**	**Wear & Tear**
Specific Description of Items Found:						
Other Observations:						

Paper Products/ Biodegradable:	**# in Stream:**	**# on Banks:**		**Source I.D.**	**% Algae**	**Wear & Tear**
Specific Description of Items Found:						
Other Observations:						

Household Items	**# in Stream:**	**# on Banks:**		**Source I.D.**	**% Algae**	**Wear & Tear**
Specific Description of Items Found:						
Other Observations:						

Landscape Materials	**# in Stream:**	**# on Banks:**		**Source I.D.**	**% Algae**	**Wear & Tear**
Specific Description of Items Found:						
Other Observations:						

Aluminum/Metal:	# in Stream:	# on Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Automotive:	# in Stream:	# on Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Toxic/ Hazardous Material:	# in Stream:	# on Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Glass:	# in Stream:	# on Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Bio/Hazardous:	# in Stream:	# on Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Personal Effects:	# in Stream:	# on Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Sports Equipment:	# in Stream:	# on Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Miscellaneous:	# in Stream:	# on Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Appendix E – Sample Field Forms

Chain of Custody Collection Date:_____ Client/Project:_____

Sampled By Organization: Samplers:					Analyze (container size & type / preservation & filtration)						
Destination Lab: Address: Phone:											
Sample ID	**Sampling Location**	**Sample Time**	**Sample Matrix**	**Collection Temp °C**							Notes/ Observations:
Observations / Weather / last rain / Comments / etc.:											

Delivery Method / Notes:	Arrival Condition, Time/Date, Temp, Notes:
Relinquished by: _____ _____ _____ (Signature) Date Time _____ _____ _____ (Signature) Date Time	Received by: _____ _____ _____ (Signature) Date Time _____ _____ _____ (Signature) Date Time

Data Review (Initials/Date) _____

Sampled by
Organization:
Samplers:

Field Measurements

Instrumentation used for measurements:
Date/time of calibration:

Analysis Type	Depth	Temperature	Temperature	pH	Dissolved Oxygen	Dissolved Oxygen	Conductivity	pH 7.0 check
Analysis Results Units	(m)	air (°C)	water (°C)	(SU)	(mg/L)	(%/L)	(uS/cm)	(SU)
Sample Site ID								
Sample Location								
Lab Sample ID								
Sampling Date								
Sampling Time								
Sample Site ID								
Sample Location								
Lab Sample ID								
Sampling Date								
Sampling Time								
Sample Site ID								
Sample Location								
Lab Sample ID								
Sampling Date								
Sampling Time								

Sample Site ID									
Sample Location									
Lab Sample ID									
Sampling Date									
Sampling Time									

Sample Site ID									
Sample Location									
Lab Sample ID									
Sampling Date									
Sampling Time									

Analyst: _____ Approved by: _____ Date: _____

Quality Control Officer

Field Log Collection Date:_____ Client/Project:_____

Sampled By Organization: Samplers:	Site ID / Description /Location:
Observations / Weather / Qualitative Water Quality / Comments / etc.:	
Flow Measurements: Velocity Meter:	
Delivery Method / Notes:	Arrival Condition, Time/Date, Temp, Notes:
Sampler 1: _____ _____ _____ (Signature) Date Time	Sampler 2: _____ _____ _____ (Signature) Date Time

_____

Data Review (Initials/Date) _____

Appendix F – LACFCD Background Information

In 1915, the Los Angeles County Flood Control Act established the LACFCD and empowered it to manage flood risk and conserve stormwater for groundwater recharge. In coordination with the United States Army Corps of Engineers the LACFCD developed and constructed a comprehensive system that provides for the regulation and control of flood waters through the use of reservoirs and flood channels. The system also controls debris, collects surface storm water from streets, and replenishes groundwater with storm water and imported and recycled waters. The LACFCD covers the 2,753 square-mile portion of Los Angeles County south of the east-west projection of Avenue S, excluding Catalina Island. It is a special district governed by the County of Los Angeles Board of Supervisors, and its functions are carried out by the Los Angeles County Department of Public Works. The LACFCD service area is shown in Figure F- 1.

Unlike cities and counties, the LACFCD does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The LACFCD operates and maintains storm drains and other appurtenant drainage infrastructure within its service area. The LACFCD has no planning, zoning, development permitting, or other land use authority within its service area. The permittees that have such land use authority are responsible under the Permit for inspecting and controlling pollutants from industrial and commercial facilities, development projects, and development construction sites. (Permit, Part II.E, p. 17.)

The MS4 Permit language clarifies the unique role of the LACFCD in storm water management programs: "[g]iven the LACFCD's limited land use authority, it is appropriate for the LACFCD to have a separate and uniquely-tailored storm water management program. Accordingly, the storm water management program minimum control measures imposed on the LACFCD in Part VI.D of this Order differ in some ways from the minimum control measures imposed on other Permittees. Namely, aside from its own properties and facilities, the LACFCD is not subject to the Industrial/Commercial Facilities Program, the Planning and Land Development Program, and the Development Construction Program. However, as a discharger of storm and non-storm water, the LACFCD remains subject to the Public Information and Participation Program and the Illicit Connections and Illicit Discharges Elimination Program. Further, as the owner and operator of certain properties, facilities and infrastructure, the LACFCD remains subject to requirements of a Public Agency Activities Program." (Permit, Part II.F, p. 18.)

Consistent with the role and responsibilities of the LACFCD under the Permit, the [E]WMPs and CIMPs reflect the opportunities that are available for the LACFCD to collaborate with permittees having land use authority over the subject watershed area. In some instances, the opportunities are minimal, however the LACFCD remains responsible for compliance with certain aspects of the MS4 permit as discussed above.

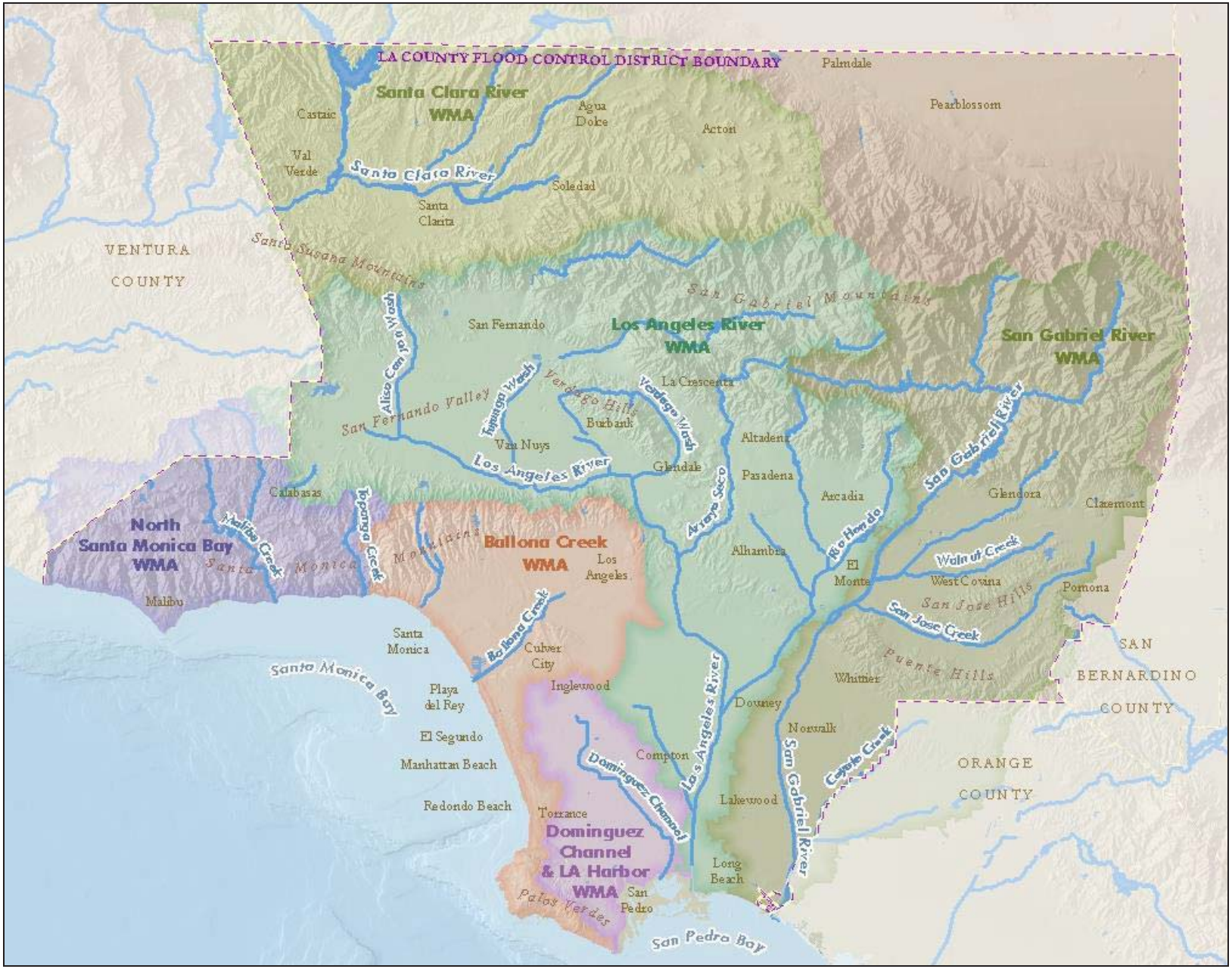


Figure F-1: Los Angeles County Flood Control District Service Area

Appendix G – Malibu Creek Watershed Trash Monitoring and Reporting Plan

APRIL 2010

Malibu Creek Watershed Trash Monitoring and Reporting Plan (TMRP)

Provided for the:

CITIES OF CALABASAS, MALIBU, WESTLAKE VILLAGE, AGOURA HILLS, AND HIDDEN HILLS, AND COUNTY OF LOS ANGELES

LARRY WALKER ASSOCIATES

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Appendices

Appendix A. Trash Assessment Worksheet

Appendix B. Trash Worksheet - Hazardous Material/Intractable Waste Log

List of Acronyms

BMP	Best Management Program
BPA	Basin Plan Amendment
CMS	Compliance Monitoring Site
FCS	Full Capture System
GAS	General Assessment Site
HACCP	Hazard Analysis and Critical Control Points
HOA	Home Owner's Association
LA	Load Allocation
MFAC	Minimum Frequency of Assessment and Collection Program
NGO	Non-Government Organization
PCS	Partial Capture System
RTAP	Rapid Trash Assessment Protocol
SWAMP	Surface Water Ambient Monitoring Program
TMDL	Total Maximum Daily Load
TMRP	Trash Monitoring and Reporting Program
WLA	Waste Load Allocation

PARTICPATING RESPONSIBLE PARTIES

The purpose of this document is to meet the requirements of the Malibu Creek Watershed Trash Total Maximum Daily Load (TMDL) (Order No. R4-2008-007) for the following implementation action items:

- Trash Monitoring and Reporting Plan (TMRP); and
- Minimum Frequency of Assessment and Collection Program (MFAC)/Best Management Practices (BMP) Program

As outlined in the Los Angeles Regional Water Quality Control Board (herein referred to as "Regional Board") letter to stakeholders and responsible jurisdictions dated October 30, 2009, the effective date of the TMDL was revised July 7, 2009. The letter includes the provision that the TMRP must be submitted to the Regional Board for review and approval on or before April 30, 2010, which is 6 months after the date of notification of the effective date of the TMDL. Otherwise the Regional Board Executive Officer (EO) will establish an appropriate TMRP. By submitting this TMRP prior to the April deadline, the participants in this plan will have met this first regulatory milestone.

This TMRP is written with the intent that the responsible parties, as identified in Table 1, have jointly participated in the development and completion of this TMRP document and will follow the standard procedures as the mechanism for compliance with TMDL requirements.

Table 1. Responsible Parties Participating in This TMRP and MFAC/BMP Program

Responsible Party	Point Source	Nonpoint Source[1]
City of Agoura Hills	X	X
City of Calabasas	X	X
City of Hidden Hills	X	X
City of Malibu	X	X
City of Westlake Village	X	X
County of Los Angeles	X	X

1. These responsible parties are submitting the MFAC/BMP program for consideration by the EO of the Regional Board as their proposed implementation mechanism for meeting the requirements of the Nonpoint Source component of the TMDL.

The TMDL Basin Plan Amendment (BPA) lists numerous responsible parties who are not participating in this TMRP effort and are not covered by any component of this TMRP. Some of these non-participatory responsible parties are listed below:

- County of Ventura
- Ventura County Watershed Protection District
- City of Thousand Oaks
- National Park Service
- California Department of Parks and Recreation
- Santa Monica Mountains Conservancy
- CALTRANS
- Adjacent Land Owners[1]

The above listed non-participating responsible parties are solely responsible for their individual TMDL requirements, including all required monitoring for point and nonpoint sources, reporting efforts, and meeting compliance deadlines as outlined in the BPA.

It should be noted that the County of Ventura, Ventura County Watershed Protection District, and City of Thousand Oaks, while not participants in or covered by this TMRP, are submitting a similar plan with similar approaches and procedures. Both Ventura County and Thousand Oaks worked with the members of this TMRP development group to establish a watershed wide consistent monitoring strategy that will complement efforts and best utilize limited resources.

Outreach to other responsible parties, including State and National Parks was conducted at the onset of the TMRP development process, but no commitment materialized. The group is assuming the non-participating responsible parties will be implementing their own plan and the Regional Board will enforce all requirements associated with BPA milestones and requirements in an equitable manner to ensure that the trash impairments are addressed in all listed areas.

IMPLEMENTATION

The TMDL and BPA assign equal responsibility to all named responsible parties in the BPA. No one responsible party is listed in this TMDL as having any more or less responsibility for compliance with the TMRP and MFAC than the others[2]. Neither does the TMDL assign any lead role to any of the six responsible parties participating in this TMRP – each is considered equally responsible for ensuring program compliance.

The responsible parties listed in Table 1 are currently submitting this TMRP for the first year effort. At this time, no agreement to implement monitoring efforts as a group has been formalized. This TMRP will allow for a single responsible party to conduct monitoring on their own and/or responsible parties to collaborate on monitoring initiatives.

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[1] The participating agencies covered by this TMRP consider the "Land owners in the vicinity of the waterbodies…" includes entities such as school districts, Home Owners Associations (HOAs), private golf courses, and other private land owners that own or operate point sources in the Watershed. The monitoring outlined in this plan will not address privately owned or operated drains nor will address any regulatory requirement for these privately owned facilities.

[2] WLAs and LAs may be assigned to additional responsible jurisdictions in the future under Phase 2 of the USEPA Stormwater Permitting Program, or other regulatory programs.

This TMRP was developed to allow for flexibility in the various monitoring components and procedures, but ensures that a participating responsible party (either implementing on their own or in a group) meets all TMDL and BPA requirements. A structure has been developed that assigns jurisdictions specific responsibility for TMRP and MFAC elements and sites described in this TMRP. Each responsible party has been assigned one or more Compliance Monitoring Sites (CMS) as shown in Table 2. If any of the responsible parties decides to collaborate on monitoring efforts, then the participants will identify the CMS that are being addressed by the group. Details on the collection locations and collection frequencies are provided in the Assessment Site Locations and Assessment Frequency Approach sections, respectively.

Table 2. Compliance Monitoring Site(s) per Responsible Party for Implementing the TMRP and MFAC/BMP Program

Participating Responsible Party	CMS
City of Agoura Hills	CMS_MDC_1, CMS_LDC_2
City of Calabasas	CMS_LVC_1, CMS_LVC_3
City of Hidden Hills	CMS_LVC_2
City of Malibu	CMS_ML_1
City of Westlake Village	CMS_LDC_1
County of Los Angeles	CMS_MC_1

TMRP Requirements

This document addresses all TMRP requirements as listed in the BPA including:

1. Establishment of Monitoring Requirements
2. Establishment of a Baseline Waste Load Allocation (WLA)
3. Definition of Critical Conditions
4. Development of First-year Monitoring Procedures
    a. Identification of Collection Locations
    b. Identification of Collection Frequencies
5. Establishment of Reporting Requirements
6. Prioritization for Full Capture System (FCS) or Partial Capture System (PCS)/BMP program implementation
    a. Identification of High Trash Generating Areas
    b. Implementation of PCS/BMP Effectiveness Program

In addition, this document will serve as the monitoring guidelines and procedures that will be used for the MFAC/BMP program effort. Any changes and revisions to the described procedures will be included with the annual monitoring report. The MFAC program, as defined in the BPA, is "established at an interval that prevents trash from accumulating in deleterious amounts that cause nuisance or adversely affect beneficial use between collections."

The following lists the procedures used to meet TMDL requirements as listed in the BPA:

1. Conduct initial TMRP monitoring to meet the following goals:
    a. Determine WLA Baseline for Point Sources
    b. Identify Sources
    c. Identify High Trash Generation Areas
    d. Prioritize High Trash Generation Areas for Full Capture System (FCS) installation or PCS/BMP program implementation
2. Concurrently conduct MFAC collection at the defined sites included in this report and at the frequency prescribed in this report.
3. Prepare a monitoring report one year from the start of the required monitoring[3] and each year thereafter that provides the following information:
    a. WLA Baseline for Point Sources
    b. Plan for FCS and/or PCS/BMP program implementation for point sources that may include the following:
        i. First year proposed locations

[3] The start of the required monitoring program will be based upon receipt of the Regional Board EO's approval letter.

ii. Possible areas of interest for future investigation

c. Plan for implementing BMPs for nonpoint sources that may include the following:
    i. Current trash BMPs
    ii. Proposed trash BMPs
d. Tentative schedule of BMPs, PCSs and/or FCSs installation
e. Results of all monitoring efforts
f. Discussion of effectiveness of the MFAC program
g. Proposed revisions to the MFAC program including;
    i. General Assessment Site revisions
    ii. Frequency revisions

This proposed structure is a tentative list of component/elements that may be modified after the monitoring efforts begin. Any major deviations will require Regional Board notification. The first monitoring report will incorporate all monitoring results into one final report and certain components and/or elements may be added as deemed fit by the participating responsible party or parties reporting. Responsible parties, unless participating in a joint effort, will only include information that pertains to their respective jurisdiction. Final reports will not include nor cover any monitoring results or required information outside of their jurisdiction.

Monitoring and Assessment Approach

As described in the Overview section of this report, the TMRP needs to include a number of elements and meet several requirements. To achieve those goals, an assessment approach was developed that utilizes a similar approach to other Regional Board approved TMRPs currently being implemented in Ventura County. For this TMRP, MFAC sites are identified for each impaired Reach that falls under the jurisdiction of the participating agencies. This approach has been developed to ensure that the MFAC program requirements are being completely met at the approved locations and frequencies outlined in this document, and subsequently utilize MFAC data and information to the greatest extent possible to meet TMRP requirements. This approach will ensure that limited resources are used in the most efficient manner and duplicative efforts are minimized.

ASSESSMENT SITE LOCATION APPROACH

The impaired Reaches listed in the BPA include a number of broadly defined locations in the Malibu Creek Watershed. The Malibu Creek Watershed poses unique challenges due to the topography of the land with steep ravines and densely vegetated riparian corridors which creates many dangerous and inaccessible areas that cannot be safely monitored. In addition, there are private properties requiring permission to access some areas of the impaired Reaches in the watershed. This document will discuss these unique challenges and how the stakeholders propose to address them to achieve compliance with the BPA requirements.

The proposed approach for meeting both the MFAC and TMRP requirements will include the use of two types of monitoring sites:

- Compliance Monitoring Sites (CMS); and
- General Assessment Sites (GAS)

The CMS are specific locations within impaired waterbodies within the Watershed that will be representative of the defined Reach described in the BPA. The CMS will be considered a component of the MFAC program and will be considered the points of compliance for all TMDL milestones and reductions. The CMS will also serve to fulfill TMRP requirements, including the development of the trash baseline allocation and identification of sources via the detailed collection taking place at the site.

The GAS will be utilized to further identify high trash generating areas upstream of CMS locations, site specific BMP effectiveness monitoring, site specific conditions prior to BMP implementation (both full and partial capture systems), specific land use characterization, and other applications as deemed necessary by the participating responsible parties. The GAS will not be utilized as points of compliance for TMDL milestones and reductions, but supplement the information gathered at the CMS.

COMPLIANCE MONITORING SITES

CMS will serve the following purposes under this TMRP:

- CMS are set locations that allow for repeatable monitoring efforts and comparable data analysis for the duration of the first year effort and future efforts.
- CMS will be utilized to measure compliance with TMDL trash reduction goals.

- CMS will be utilized to establish baseline conditions and allocations.

The CMS were chosen for their safety and accessibility as well as their representation of their respective impaired Reaches. Each CMS will provide a representative assessment of the waterbodies listed in the BPA, provide locations for long-term assessment, and be representative of participating jurisdictions covered by this TMRP. In certain circumstances, there is more than one CMS per impaired Reach and/or jurisdiction.

Detailed monitoring of up to 100-foot sections of stream length in the impaired reach will be conducted at each CMS. Monitoring procedures are described in the Assessment Procedures section of this report. The CMS will also be used to assess the impact of seasonal variations and critical conditions (major wind and rain events) in the Watershed. CMS will also be monitored per special conditions such as during high visitation times (i.e., summer/dry season) in the Malibu Lagoon area. Specific details pertaining to each site sampled will be included in subsequent annual monitoring reports.

GENERAL ASSESSMENT SITES

GAS may be utilized to provide assessment for areas within the Watershed and may assist in fulfilling the remaining TMRP requirements. The general assessment sites may serve the following purpose(s):

- Characterize and/or locate high trash generating areas. This will be performed in two methods:
    - Locating sites below or near discharge locations known to be areas of interest identified in previous studies or information, including non-government organization (NGO) data reports, previous monitoring efforts for other TMDL efforts, or jurisdictional/municipality information.
    - Locating sites below or near discharge locations of interest that may be significant trash sources, yet information on the location has not been previously collected.

      This information would be utilized to target and/or prioritize areas for FCS, PCS, or BMP programs. This data may also be utilized as supporting information for a request to incorporate non-listed entities as potential responsible parties contributing to the trash impairment.
- Prior to the installation of any BMP, a responsible agency may locate a GAS below or near a discharge location to gather trash data for “pre-installation” conditions. After installation, data gathered at that location may be utilized to assess “post-installation” conditions showing BMP effectiveness.
- Characterize land use loadings and/or general sources of trash accumulation.
- Characterize locations of the impaired Reaches that are not significant sources of trash and considered low priority for any trash BMPs.
- General assessment of any location within the impaired Reaches that any participating responsible party deems necessary to gather trash data that may assist in BMP implementation.

As this effort moves forward, the utilization of GAS may be modified as deemed necessary under the discretion of the responsible party or parties. This modification may involve ceasing assessment

activities at one particular site, moving of sites to different locations, or adding sites to further supplement data needs.

Overall, the GAS are meant to provide supplemental information. The GAS will not be used as points of compliance for trash reduction goals or milestones in this first year effort or subsequent efforts.

GAS will be up to 100-foot segments similar to the CMS. GAS monitoring will not be conducted at the same level of effort or frequency as the CMS. Monitoring procedures conducted at the GAS may include categorizing, article counting, photo evidence, and weighing all trash that is collected. Monitoring procedures are described in the Assessment Procedures section of this report. No specific source identification data will be collected and the specific amount of information collected per GAS may vary based on feasibility, necessity of information, and accessibility of the site. Similar to the CMS, GAS will not be located in areas deemed unsafe, inaccessible or on private property where access has not been granted.

TMRP COVERAGE

Figures 1 through 4 detail the overall area covered by this TMRP in the Malibu Creek Watershed and within each impaired sub-watershed. Other responsible parties not participating in this TMRP effort (as listed previously, the County of Ventura, the City of Thousand Oaks, State and National Parks, Caltrans, and private land owners) will be fully responsible for submitting monitoring plans and reporting compliance for the areas not addressed by this TMRP. The participating responsible parties to this TMRP will not be held responsible for any monitoring not conducted in the areas defined as being outside the boundaries characterized in Figures 1 through 4.

Locations that are specifically listed in the BPA Implementation Element - Nonpoint Source section for collection activities that are not covered by this TMRP include the following:

- State Park Areas within Malibu Creek (from Lagoon to Malibou Lake)
- State Park Areas within Malibu Lagoon
- Malibou Lake
- National Park Areas within Medea Creek Reach 1
- Areas within Medea Creek Reach 2 located in Ventura County
- Areas within Lindero Creek Reach 2 located in Ventura County
- Lake Lindero
- State Park Areas within Las Virgenes Creek
- Areas within Las Virgenes Creek located in Ventura County

INACCESSIBLE AREAS

Areas of the Watershed that are deemed inaccessible due to safety concerns or limited access will not be assessed by this effort. Specifics on areas deemed inaccessible and fall under the jurisdiction of the responsible parties will be included in the annual monitoring reports.

ASSESSMENT PROCEDURE APPROACH

Trash assessment for the TMRP requires the collection of trash in a specified manner that allows for the generation of reproducible results that can be compared over time. Additionally, the assessment procedure needs to define the metric that will be used to measure the trash collected. The standard procedures per each type of site (CMS vs. GAS) also vary, with a more detailed approach at the CMS. The Standard Operating Procedures (SOPs) for the assessment can be found in the Assessment Procedures section of this document.

The assessment procedure approach that has been selected for this TMRP is a modified version of the Rapid Trash Assessment Protocol (RTAP), California Regional Water Quality Control Board, San Francisco Bay Region, November 15, 2004 (Developed by members of the San Francisco Bay Regional Board's Surface Water Ambient Monitoring Program [SWAMP]) combined with elements from the Oxnard City Corps Stormdrain Keeper Program. The RTAP has been modified in some ways to better suit to the goals of this TMRP and MFAC program. The modifications include the addition of several metrics to allow a variety of options for defining the baseline and a removal of the "scoring" portion of the RTAP. The scoring portion of the RTAP is a subjective analysis that is more appropriate for assessing the "hazard" level of the trash. These procedures are not necessary for meeting the goals of the TMRP and MFAC. The additional metrics to be assessed include the number of trash bags, weight of trash collected, and total trash collection time per site.

Assessment Site Locations and Monitoring Frequencies

ASSESSMENT SITE LOCATIONS

Compliance Monitoring Site Locations

Figures 2 through 4 present the locations of CMS in the Malibu Creek Watershed. The following is a summary of the sites presented:

Malibu Lagoon

CMS_ML_1 - Site located just upstream of the Pacific Coast Highway (PCH) crossing, on the left bank upstream from the bridge.

Malibu Creek

CMS_MC_1 (Upper Malibu Creek) - Site located on the west bank immediately upstream of the Malibu Creek Canyon Road crossing and downstream of the Tapia WWTP facility.

Las Virgenes Creek

CMS_LVC_1 - Site located in the concrete flood control channel, upstream of the Parkmor Road crossing.

CMS_LVC_2 - Site located in the restored stream channel, just upstream of the Rondell Street crossing and downstream of the Hwy 101 freeway crossing.

CMS_LVC_3 - Site located in the concrete channel just downstream of the Lost Hills Road crossing.

Medea Creek

CMS_MDC_1 - Site located in the concrete channel upstream of the confluence with Cheseboro Creek and just downstream of the Agoura Road crossing.

Lindero Creek

CMS_LDC_1 - Site located in the concrete channel just upstream of the Thousand Oaks Boulevard crossing and just downstream of the golf facility driving range.

CMS_LDC_2 - Site located in the engineered channel just downstream of the Agoura Road crossing.

The frequency of collection per site is listed in Table 3 and assessment procedure details are listed in the Assessment Procedures section of this report.

General Assessment Site Locations

No GAS have been located at the time of development of this document. As stated previously, the GAS are not required for this effort but can be utilized to gather further information as deemed necessary. A list of any GAS utilized during this effort and a summary of findings by site will be included in the annual monitoring report.

ASSESSMENT FREQUENCY APPROACH

The frequency of assessment per the impaired Reaches listed in the BPA varies greatly, from a frequency of twice a week to monthly. To better utilize resources and have a more compatible first

year data set, the frequencies of monitoring at the listed waterbodies have been modified. By modifying frequencies for collection events, the participating responsible agencies will better utilize limited resources for this first year effort. As listed in the BPA, after the first year effort, collection frequencies can be revised pending review of the data collected through this program.

For CMS, the following frequencies listed in Table 3 per individual site will be adhered to until noted as otherwise in subsequent monitoring reports.

Table 3. Frequency of Assessment at Compliance Monitoring Sites

Impaired Subwatershed	Compliance Monitoring Site(s)	Site Description in BPA[1]	Assessment Frequency
Malibu Creek (From Malibu Lagoon to Malibou Lake)	CMS_MC_1	***Within the County of Los Angeles & in the State Parks***	**Monthly**
Malibu Lagoon	CMS_ML_1	***The waterbody, shorelines, beach & areas adjacent to Malibu Lagoon***	**Bimonthly**
Medea Creek Reach 2 (Above Confluence)	CMS_MDC_1	***Waterbody, shorelines & the adjacent areas from the confluence w/ Lindero Creek to the intersection w/ Thousand Oaks Blvd***	**Bimonthly**
Lindero Creek Reach 1 (Confluence with Medea Creek to Lake Lindero)	CMS_LDC_2	Lindero Creek Reach 1 including the waterbody, shorelines & the adjacent areas	**Bimonthly**
Lindero Creek Reach 2 (Above Lake Lindero)	CMS_LDC_1	***Lindero Creek Reach 2 including the waterbody, shorelines & the adjacent areas***	**Monthly**
Las Virgenes Creek	CMS_LVC_3	***Waterbody, shorelines & adjacent areas between Mulholland Highway & Juan Bautista De Anza Park at Los Hills Road in the City of Calabasas***	**Bimonthly**
	CMS_LVC_1 CMS_LVC_2	Waterbody, shorelines & the adjacent areas for the rest of the City of Calabasas	**Bimonthly**

1. ***Bold and Italicized*** Site Descriptions include areas where there is an overlap of responsibility with National Parks, State Parks, privately owned land with restricted access, and/or Ventura County responsible parties.

For the GAS, a monthly assessment will be conducted for the first year of this effort. The frequency of assessment at general assessment sites may be modified upon review of the data gathered.

The responsible parties participating in the development of this program intend to initiate monitoring based upon the receipt of a letter of approval from the Regional Board EO. Until formal notification from the EO, no monitoring activities will take place. If there are any delays in the initiation of the monitoring program, immediate notification will be given to the Regional Board staff, including a narrative description of the cause of the delay and corrective actions taken to overcome the delay.

Seasonal Variations/Critical Conditions

SEASONAL VARIATIONS

The BPA requires that responsible parties account for both seasonal and weather related influences during the TMRP/MFAC monitoring effort. Results of the required monitoring data will be analyzed to identify any trends that may be attributed to seasonal variations and a discussion will be included in the annual monitoring report.

CRITICAL CONDITIONS (WIND AND RAIN)

To evaluate both high wind and rain events, the collection of trash during "pre-" and "post-" critical condition events will be analyzed at CMS only, in a similar approach to procedures being conducted in the Ventura County Trash TMDL TMRP efforts. Like the Ventura County efforts, responsible parties will attempt to sample three wind and three rain events per year.

Due to the sheer size and geographic variation of the Malibu Creek Watershed - where conditions can change significantly between the upper Watershed in the Santa Monica Mountains and the coastal region, for example - one set standard or trigger for critical conditions will not be adopted. In lieu of defining the critical condition triggers in this document, responsible parties will initiate collection when conditions are deemed favorable for a "pre-" collection event. Specifics of the event (total rainfall, wind speed, relevant National Weather Service [NWS] warnings) will be recorded. When conditions are deemed safe (following procedures outlined in the Health and Safety Plan), crews will conduct a "post-" collection event.

The results of the critical conditions collection events will be included in the annual monitoring report.

Collection Event Preparation

Collection events should only be conducted during full daylight hours under safe weather and environmental conditions. Safe weather conditions are defined as no forecasted weather (wind or rain) events for the day of collection. The weather forecast should be checked immediately prior to each collection event. Precipitation events within the Watershed can cause water to rise rapidly and create unsafe conditions. Crews should also check with the local and state agencies to ensure that no wildfire events are taking place in the Watershed. Crews are not allowed in the Watershed during any wildfire events. If at any time during a collection event field personnel feel that site conditions are unsafe for any reason, the event should be abandoned and the project manager notified of the situation. Prior to mobilization for each collection event, field personnel should prepare the equipment necessary to conduct the trash collection event. Required equipment is listed in Table 4.

Table 4. Equipment Checklist

Required Trash Assessment Items	
☐ First Aid Kit	☐ Hip Boots
☐ Cellular Telephone	☐ Large Trash Bags (Glad Lawn & Leaf Bags: 33" x 41" x 1.1 mil (39 gallon)
☐ MCW TMRP	☐ Work Gloves
☐ Trash Assessment Worksheets	☐ Trash Grabber
☐ Clipboard	☐ Metal Kitchen Tongs
☐ Notebook	☐ Tape Measure
☐ Pens/Pencils	☐ Maps and Aerial Photos
☐ GPS Unit	☐ Digital Camera
☐ Sharps Container	☐ Poison Oak Protective Lotion/Calamine Lotion
☐ Ziploc Bags	☐ Hand Sanitizer

Additionally, any necessary permits required to access flood control channels for trash removal will be obtained prior to the collection event.

SITE DEFINITION

All CMS locations have been identified as listed in the Assessment Site Location section of this report. At each of the selected monitoring locations, shown in Figures 1 through 4, monitoring will take place at the section of the stream that is identified as the “monitoring site”. All subsequent collection events will take place within the same identified site. If for any reason the location of a site is modified during an assessment event, the field crews will need to note the change and contact the project manager.

Stream Length

Prior to or during the first collection event, the site to be sampled will be accurately measured and include documentation of the sinuosity of the channel. The length should be measured as the actual stream length (including curves), not in a straight line. Where possible, the upstream and

downstream boundaries of each site should be identified by clearly visible landmarks, such as large trees or boulders. If possible, the boundaries should be flagged or marked to serve as reference for subsequent events, thus saving valuable monitoring time. In addition, GPS coordinates should be recorded for the boundaries of each site during the first event. Again, if a section of the length is blocked or deemed inaccessible, the site can be moved upstream or downstream to a more accessible location, if available. Any change will be noted and the project manager notified upon completion of the event.

Upper Boundary of Banks

Prior to or during the first collection event, the field team will document the upper boundary of the banks to be surveyed. This boundary represents the boundary within which trash can be carried to the waterbody by wind or water (e.g., an upper terrace in the stream bank) and will be assessed during a trash collection event. This boundary may also be defined by a physical structure, such as the fence or a roadway. Upper boundaries for each monitoring site (compliance and/or general) will be documented in the field notes and with digital photographs. Subsequent assessment events should follow similar procedures and monitoring within the same general locations. If unable to resample previous areas, field crews will have to note the change in the assessment worksheets.

Assessment Procedures

For the required collection events, trash will be collected following standard operation procedures as outlined in this document. The amount of effort per event will vary based upon the types of sites being assessed for that specific event. However, procedures outlined in this document are still required to be followed. During each collection event the amount and type of trash will be recorded. The amount of trash will be determined using three metrics: pieces of trash, number of trash bags filled, and weight of trash.

TRASH COLLECTION PROCEDURES

During each collection event at each site, two-person monitoring crews will walk through the entire monitoring site, picking up every piece of trash found. For this TMRP, all items greater than five millimeters (mm) in size within the monitored site should be picked up (or accounted for if too large to collect). Picking up all trash items will allow the site to be revisited and re-assessed for impairment and usage patterns.

COMPLIANCE MONITORING SITE COLLECTION PROCEDURES

For the CMS, the following procedures must be followed.

While collecting the trash, the field crew will fill out a trash assessment worksheet (attached in Appendix A). Trash collection will be conducted using the following procedures:

1. Begin the survey at the downstream end of the site so that trash can be seen in the undisturbed stream. On the assessment worksheet, mark down the starting location of the trash assessment.

2. One team member begins walking along the bank or in the stream along the water's edge. That team member looks for trash on the bank up to the upper bank boundary, and above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either in stream or on the bank. The person will also code the source of the trash using the key on the trash assessment worksheet.

3. The second team member walks in the streambed and/or bank where feasible picking up and calling out specific trash items found in the water body and on the opposite bank both above and below the high water line. The information will be recorded by the first team member and coded appropriately on the trash assessment worksheet.

4. If available, multiple individuals can collect trash in the stream or on the bank, **but only one individual is to be recording/tallying information** on one trash assessment worksheet (i.e., multiple records are not allowed due to possible confusion, data recording duplication mistakes, and possible errors in transposing information from worksheet to worksheet).

5. All team members must take caution when walking the site and only collect in areas that are safe and accessible. If a bank or section of the site is in-accessible the area should be noted on the assessment worksheet.

6. To avoid injury while picking up trash, all team members should always wear gloves and avoid touching trash with unprotected hands.

The person tallying the trash will indicate on the worksheet whether the trash was found above the high water line on the bank, or below the high water line (either on the bank or in the stream). This can be done by recording a dot (•) for above high water line and a tally line (|) for below the high water line. If it is evident that items have been littered, dumped, or accumulated via downstream transport, a note should be included at the bottom of the worksheet. If the monitoring crew identifies a more efficient and/or modified method to record this information, the method must be approved prior to initiating a collection event by the project manager.

Trash that is collected must be identified using the key provided on the last page of the trash assessment worksheet. Identifying the source of the trash, if possible, may support development of targeted BMPs. Use the two letter ID in the provided space on the worksheet for recording the source.

Another method to help identify the original source location of trash will include a visual analysis to determine the amount of algae growth present, "wear and tear" on the item, and location of item within the streambed. A range is given on the trash assessment worksheet as to quantify the extent of these three potential indicators of trash age. The percentage of algae growth on the item's surface may indicate the amount of time the trash has been in the water, though only items with 50% algae growth or greater should be recorded. The classification of "wear and tear" will include noting any significant wearing off of print/coloring and noting dents or anything broken on the object. Lastly, the location of the item of trash in the streambed will be noted (i.e. in-stream, on bank). These will all serve as guidance in identifying how much trash and which types of trash may potentially drift downstream from an upstream location (i.e., did not originate at the location collected).

A trash grabber, metal kitchen tongs, or a similar tool should be used to help pick up trash. It is important to look under bushes, logs and other vegetation to see if trash has accumulated underneath. The ground and substrate should be inspected to ensure that small items such as cigarette butts and pieces of broken glass or expanded polystyrene are picked up and counted.

All collected trash shall be placed in 39-gallon trash bags. To the extent possible, trash bags should be filled to approximately ¾ full so that all bags represent approximately the same volume of trash.

To account for items which are too heavy to be lifted or are embedded in the streambed (referred to as *Intractable Trash*), specific notes will be written on the Hazardous Materials/Intractable Waste Log (attached in Appendix B) along with digital photographs and GPS coordinates as to not count the same items during the next collection event. Intractable trash items will need to be removed by qualified individuals (possibly with heavy equipment which may require special permits) and the monitoring crew shall not try to remove these items themselves. Information on who to contact to remove such items is listed in the contact sheet and after the first collection event, the contractor or monitoring crew will immediately contact the project manager to notify the appropriate individuals to address intractable trash items.

Prior to deployment, the monitoring crew shall be informed or trained as to what hazardous materials they may encounter. If a potentially hazardous item is found during the collection, the crew will be advised not to touch or move the item but shall inform the lead field technician. If the lead field technician determines that the item cannot be safely removed, then the location of the item will be documented (along with photographs and GPS coordinates) on the Waste Log. The appropriate

authorities will be contacted immediately for removal of the hazardous item(s) if proper training or collection materials are not available to the monitoring crew.

Hazardous material identification and removal is further defined in the Health and Safety Plan along with a list of items considered "hazardous" and banned from disposal in the trash. More information can be found on the Calrecycle Website (http://www.calrecycle.ca.gov/HomeHazWaste/info/).

Compliance Monitoring Site Completion

Following the completion of the assessment worksheet, the team should use the worksheet margins to count up two totals for each trash item line, one total for items found above the high water line (on bank), and one total for items found below the high water line (in-stream). Additionally, the team should sum the totals for each trash category and write the results in the provided spaces just to the right of the category name. The start time, end time, and total time elapsed for the collection event should be noted on the worksheet. Total weight of trash collected for each site will be completed prior to leaving[4], and included on the worksheet. It is important to complete the worksheets before leaving the site in order to guarantee accuracy.

Observations about the condition of the site, locations of trash found, potential contributing sources, and other observations should be recorded in the appropriate spaces on the trash assessment worksheet.

Additionally, the number of trash bags collected at the site and the type and size of trash bags filled should be recorded on the trash assessment worksheet in the space provided.

GENERAL ASSESSMENT SITE COLLECTION PROCEDURES

The effort for the GAS monitoring, which is generally similar to the CMS monitoring effort, will be as follows:

1. Similar to the CMS, the survey will begin at the downstream end of the site so that trash can be seen in the undisturbed stream. On the assessment worksheet, mark down the starting location of the trash assessment.

2. One team member begins walking along the bank or in the stream along the water's edge. That team member looks for trash on the bank up to the upper bank boundary, and above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either in stream or on the bank, and into a general category as listed in the worksheet. Source ID information will not be required.

3. The second team member walks in the streambed picking up and calling out specific trash items found in the water body and on the opposite bank both above and below the high water line. The information will be recorded by the first team member and coded appropriately on the trash assessment worksheet.

[4] If total weight cannot be completed at the site, crews will need to ensure that the trash for that site is kept separate from other trash collected at other sites (if sampling multiple sites in one day) and weighed separately and recorded on the appropriate site worksheet.

4. In areas where large amounts of trash are accumulating, it will be noted on the trash assessment worksheet the location of the accumulation, and general descriptive notes to better identify the area (including if the location is a drain, general geographical location information, and nearest street or road crossings including approximate length from crossings either upstream or downstream).

5. If large items are identified or hazardous materials are found, the team will fill out a Hazardous Materials/Intractable Waste Log (see CMS procedures).

6. If available, multiple individuals can collect trash in the stream or on the bank, **but only one individual is to be recording/tallying information** on one trash assessment worksheet (i.e. multiple tally sheets are not allowed due to possible confusion, data recording duplication mistakes, and/or possible errors in transposing information from worksheet to worksheet).

7. All team members must take caution when walking the site and only collect in areas that are safe and accessible. If a bank or section of the site is in-accessible, the area should be noted on the assessment worksheet.

8. When a reach area is deemed completely assessed (hence the site is complete), the first team member shall mark on the worksheet a specific stopping point including specific geographical information.

9. After the collection event has been completed, information should be tallied and all trash disposed of properly. General procedures (e.g., preparation, equipment, worksheet completion etc.) for the GAS follow CMS procedures, including the use of 39 gallon trash bags.

General Assessment Site Completion

Following completion of the site, the team should use the worksheet margins to count up two totals, one total for items found above the high water line, and one total for items found below the high water line. Additionally, the team should sum the totals for each general trash category and write the results in the provided spaces just to the right of the general category name. The start time, end time, and total time elapsed for the collection event should be noted on the worksheet. It is important to complete the worksheets before leaving the site in order to guarantee accuracy.

General site observations should be recorded in the appropriate spaces on the trash assessment worksheet.

Additionally, the number of trash bags collected and filled should be recorded on the worksheet in the space provided.

POST-EVENT ACTIVITIES

At the completion of each collection event, all collected trash will be disposed of properly. If trash is taken to a landfill or recycling facility, all trash can be weighed and a receipt obtained that document's the weight of the trash.

The contractor or in-house forces should make all attempts to recycle the materials collected during the event, with time permitting. The recycling of materials is not a requirement of the TMDL or the TMRP/MFAC and is at the discretion of the contractor and/or responsible agency. All "hazardous"

or “intractable trash” items need to be reported to the project manager and/or responsible agency to initiate removal procedures.

Special Circumstances for Safety Consideration

There are several potentially dangerous factors that exist within the Malibu Creek Watershed. One of these is the potential to encounter homeless individuals or encampments in the area. The other factors include poison oak, steep channels, confined spaces, swiftwater/flood conditions, wildlife, wildfires, and invasive species. While not a concern for personal safety, the threat of accidental transport of invasive species within the Watershed is possible. The potential for these special circumstances are discussed in more detail below and in the Health and Safety Plan[5].

HOMELESS INDIVIDUALS AND PROPERTY

There is the potential for encounters and/or interactions with homeless individuals in the course of trash collection activities. This includes the possibility of unknowingly collecting items which homeless individuals may dispute to be personal property, thus creating the potential for an altercation. During any collection event, it is standard procedure for field staff to use discretion in all interactions with all individuals in the field and handle themselves in a professional and courteous manner. If at any time field staff feel uncomfortable or in danger, activities must immediately cease and all staff must return to a safe location. In the event this takes place, field staff need to record the amount of collection that took place prior to the work stoppage, and note on the assessment worksheets the end point location and time. If any situation escalates to a perceived dangerous level, field staff must immediately leave the area and contact the appropriate authorities. In the event that trash items appear to be property of a homeless individual, field staff should thus consider the items as “intractable trash” and follow procedures outlined in the Hazardous Materials and Intractable Trash section of the Health and Safety Plan. Preserving the safety of the field crew is the top priority during all collection events.

ARUNDO AND POISON-OAK

During trash collection there is the potential for contact with Arundo (*Arundo donax*) and Poison-Oak (*Toxicodendron diversilobum*). Arundo, which may be encountered in the lower reaches of the Malibu Creek Watershed, can grow up to 10 meters in length and create extremely dense vegetated environments. Due to the size and density of Arundo habitats, there is the possibility of tripping and/or entanglement when entering a thicket of Arundo vegetation. **Trash will not be collected within any areas with Arundo vegetation**. However; trash may be collected on the edge of the vegetation if safe and accessible. Poison-Oak growing at or near assessment locations should be avoided if at all possible. Trash seen in the Poison-Oak is not required for collection, but should be noted and photographed. Field staff will be advised to put on Poison-Oak protective lotion before entering any sites where the shrub is growing. Field staff should also be aware that even when Poison-Oak is dead, the oil can remain active for up to five years.

[5] The Health and Safety Plan (HSP) is intended to address the most common hazards which are likely to be observed and compliment existing HSPs that responsible parties may already have in place. It is not intended to be an exhaustive or all inclusive list and may be modified per future revisions to TMRP procedures. Collection crews should always take care to put personal safety first and contact the project manager if they have any questions regarding questionable hazards, potential dangers, or issues that may be encountered.

STEEP CHANNELS

Many of the assessment sites included in this TMRP are located in flood control channels or channels containing steep banks. The potential to slip and fall causing injury is possible in many of the locations, even during the driest of weather. Field crews will need to ensure that all precautions are taken when sampling in environments exhibiting these conditions. Field crews should identify safe points of entry to the sites. During the monitoring effort, field crews should take extreme caution when walking in channels and ensure that all procedures as outlined in the Health and Safety Plan are followed. All dangerous environments, including narrow banks above concrete channel fence lines, are deemed off limits during any collection event.

CONFINED SPACES

At no time during the collection effort are field crews to enter any confined spaces, including storm drain outlets, freeway underpass tunnels, or any confined areas located at or near a collection location. These confined spaces can contain pockets of dangerous gas build up and other potential hazards that field crews are not properly trained to address. If trash is accumulating within a confined space, the project manager will be notified of the specific site location, and a brief narrative of the observations and the time and date of the observation will be provided.

SWIFT WATER/FLOOD CONDITIONS

At no time are field crews to be in stream channels (engineered or natural) during swift water and/or high flow conditions, nor should crews be in any channels if a forecasted storm (of 20% or greater chance of precipitation) is predicted for that day. Monitoring for critical storm conditions must take place prior to any rainfall occurring. All activities must be suspended immediately if crews are in the field and rainfall occurs. The extent of collection completed prior to rainfall will be noted on the assessment worksheet. After any rainfall event, crews are prohibited from re-entering stream channels until flow velocities have returned to base flow conditions and/or conditions are deemed safe by the project manager or proper authorities.

WILDLIFE

There is the potential for crew members to encounter various wildlife that may pose a threat, including but not limited to poisonous reptiles, stinging insects, and mountain lions. Prior to initiating the monitoring effort, crew members must be properly informed and trained on how to avoid encounters with threatening wildlife and how to handle any encounter or interaction in the field.

WILDFIRES

The Malibu Creek Watershed has repeatedly been subject to wildfires. Many of the assessment sites are located within or near potential burn areas and all precautions should be taken to ensure no field crew members initiate any actions that could start a wildfire, nor hinder or interfere with any wildfire suppression activities. Subsequently, during any wildfire event that is taking place in the Watershed, all collection events will cease until the wildfire has been suppressed. After suppression of the wildfire, field crews will need to confirm with the project manager that conditions are safe to reinitiate assessment efforts. If a wildfire begins during a collection event, crews will need to evacuate immediately, then proceed to document the extent to which the event was complete.

INVASIVE SPECIES

There is the potential for field crews to come in contact with invasive species found in the Malibu Creek Watershed, including the New Zealand Mudsnail *(Potamopyrgus antipodarum)*. Crews have the potential to further spread invasive species if proper precautions are not taken prior to, during, and after an event. Crews must follow procedures as outlined by the CA Department of Fish and Game, New Zealand Mudsnail Invasive Species Program (http://www.dfg.ca.gov/invasives/mudsnail/) and the United States Fish and Wildlife Service Invasive Species Program (http://www.fws.gov/invasives/what-you-can-do.html). Crews may also want to consider developing a Hazard Analysis and Critical Control Points (HACCP) planning document specific to their monitoring sites.

Reporting Requirements

MONITORING REPORT

After the completion of the first full year of monitoring, a report will be submitted to the Regional Board that includes all of the requirements and elements listed in the TMRP Requirements (for both Point Source and Nonpoint Source components) section of this TMRP. The report may include more information beyond the items listed in the referenced section at the discretion of the reporting party or parties.

TMRP/MFAC REVISION

All proposed revisions to the TMRP and/or MFAC program will be included as a component with the annual monitoring report. Revisions may include but are not limited to:

- Procedural revisions or modifications;
- Site location revisions; and
- Modifications to frequency of monitoring/assessments.

ESTABLISHMENT OF THE BASELINE

Weight, volume, counting, and source identification will be incorporated in the initial 12-month assessment and all four components may be included to compare and contrast the differences between each and determine which (if not all) is the most applicable for the establishment of the baseline. An averaging period will be determined after the initial 12-month assessment along with a comparison of seasonal, wind event, and wet weather data to determine if a relationship exists between these variables and the amount of trash. Responsible parties may also compare the results of the 12-month effort to existing baselines calculated for similar TMDL efforts in Ventura and Los Angeles Counties. The proposed baseline will be included in the annual monitoring report.

CURRENT BMP EFFORTS

Listed below are current trash management procedures or Best Management Practices (BMPs) that have been put in place by the responsible parties listed in Table 1. These BMPs, combined with the monitoring described in the TMRP, represent the initial MFAC/BMP program for the responsible parties covered by this TMRP. As new BMPs are implemented in the Watershed, this list (per responsible party) will be updated to account for increased efforts. Current BMPs include:

City of Agoura Hills

- Existing Ordinances:
  - No. 9392.1. - *Outdoor Storage and Display Standards Enumerated* - All landscaped areas shall be maintained in a neat, clean and healthful condition subject to the continuing review of the director. Such maintenance shall include proper pruning, mowing of lawns, weeding, removal of litter, fertilizing, replacement of plants when necessary, and regular watering.
  - No. 9395.1. - *Outdoor Dining Design and Operational Standards Enumerated* - Outdoor dining areas, including flooring, shall remain clear of litter, food scraps, and soiled dishes at all times. Where eating establishments provide self-service take-out service, an adequate

number of employees shall be maintained to clear refuse or litter on a regular basis even though table service is not provided. Concrete flooring shall be washed daily.

Chapter 12 ***Social Host Accountability*** - (f) "Unruly gathering" shall mean a party, event or gathering where two (2) or more underage persons are present at a residence or other private property in which alcoholic beverages are being consumed, served to or possessed by any underage person and/or at which unruly conduct occurs. Unruly conduct is that which threatens the public health, safety or general welfare, or interferes with the quiet enjoyment of residential property and may include, without limitation, excessive noise, excessive traffic, obstruction of public streets by crowds or vehicles, public drunkenness or unlawful public consumption of alcohol or alcoholic beverages, assaults, batteries, fights, domestic violence or other disturbances of the peace, vandalism, litter.

- No. 5328 - *Litter* - Any person who deposits or causes to be deposited any solid waste or recyclable material on the public right-of-way or on private property within public view, except in a container provided therefore as herein provided, shall immediately sweep up and remove the same. Any person, firm or corporation violating any provision of this section shall be guilty of an infraction and shall be punishable as provided in Chapter 2 of Article I of this Code.
- No. 5335 - *Residential Collection - Solid Waste Containers* - The residential collector shall provide each residential premise with standard residential solid waste containers and green waste containers in accordance with the level of service chosen by the householder, at no cost to the householder. If a solid waste or green waste container is damaged, lost or stolen, contractor shall replace the container at cost and may bill customer for cost of container.
- No. 5300 - *Regulation of Solid Waste Haulers' Activities* - The city will promote public health and safety by, among other things, requiring newer and safer vehicles, regular maintenance, reduction of spillage and litter in the public streets, establishing accountability for the cleaning of refuse bins and containers, and accountability to the public.
- No. 5343 - *Commercial - Maintenance and Place of Containers* - Solid waste containers provided by the collector shall be maintained in a clean and healthful condition by the collector. Solid waste containers which are not provided by the collector shall be maintained in a clean and healthful condition by the commercial business owner. Every commercial business owner shall provide a solid waste container location on the commercial premises and shall keep the area in good repair, clean and free of refuse outside of the container. Every collector shall remove any solid waste or litter that is spilled or deposited on the ground as a result of the collector's emptying of the container or other activities of the collector.
- No. 5505 - *Prohibited Activities.* (b) *Littering* - It is prohibited to throw, deposit, place, leave, maintain, keep, or permit to be thrown, deposited, placed, left, or maintained or kept, any refuse, rubbish, garbage, or any other discarded or abandoned objects, articles or accumulations, in or upon any street, alley, sidewalk, storm drain, inlet, catch basin conduit or drainage structure, business place, or upon any private plot of land in the city, so that the same might be or become a pollutant. No person shall throw or deposit litter in any fountain, pond, lake, stream, or other body of water within the city. This subsection shall not apply to refuse, rubbish or garbage deposited in containers, bags or other appropriate receptacles which are placed in designated locations for regular solid waste pick up and disposal. *Structural BMP* means any structural facility designed and constructed to mitigate the adverse impacts of

storm water and urban runoff pollution (e.g. canopy, structural enclosure). Structural BMP's may include both treatment control BMP's and source control BMP's.

  - No. 9576.1 - *Trash Handling* - Trash handling facilities shall be provided for all developments with the CD overlay district with the exception of single-family detached dwellings. A trash enclosure will be provided for all but excepted uses, unless the proposed location of the trash area is completely enclosed by walls or buildings. The freestanding trash enclosure shall be constructed of masonry block. No trash shall be allowed to extend above or beyond the enclosure.

- *Street Sweeping* - Street sweeping was increased to twice a month within the City's jurisdictional streets.
- *California Highway Adoption Company* - The City has contracted the past five years with California Highway Adoption Company to perform trash pick-up and weed abatement along the freeway corridor and local streets as directed by City staff.
- *Catch Basin Grates & Filters* - The City began a pilot program with Water Way Solutions by installing catch basin grates and filters located in two areas by schools to measure their success.
- *Storm Drain Marking* - All storm drain inlets are stenciled with a "*No Dumping. Drains to Ocean.*" message.
- *County Media Contribution* - The City of Agoura Hills contributes annually to the County's *Don't Trash California* campaign.
- *Trash Receptacles* - The City has installed additional trash receptacles at various parks.
- *Covenant & Deed Restriction* - Development project subject to SUSMP requirements are conditioned to record a covenant for the maintenance of treatment devices.
- *Creek Clean-Up* - The City sponsors annual community creek clean-up events in various accessible areas of Lindero Creek.
- *City Webpage* - The City has improved their webpage by increasing the stormwater information.

City of Calabasas

- Existing Ordinances:
  - No. 2008.251 - Mobile car wash ordinance requires mobile car wash businesses to obtain permits from the City and follow certain regulations to prevent pollutants from entering the storm drain system.
  - No. 2006.217 - Second hand smoke ordinance to ensure a cleaner and more hygienic environment for the City, its residents and its natural resources including its creeks and streams.
  - No. 2007.233 - Polystyrene ban barring retail food establishments, nonprofit food providers and City facilities from using food packaging materials made of expanded polystyrene, known popularly by the trademark name *Styrofoam*.
- *Storm Drain Markers* - Over 3200 markers were installed on storm drain catch basins throughout the City.

- *CDS Units* - Calabasas has managed the installation of four Continuous Deflector Separation (CDS) Units. CDS Units allow for the separation of sediment and trash from storm water without screens thus allowing for continuous flow before discharging to local creeks. The units are cleaned out on a quarterly basis.
- *Catch Basin Screens* - Along major streets including Calabasas Road, the City has installed 42 Abtech storm screen units. These devices keep trash and debris from entering the storm drains. They are cleaned out on a quarterly basis.
- *Infiltration and Bioremediation of Urban Runoff* - The City of Calabasas was tasked to design and build a storm water treatment facility to improve the quality of water entering Malibu Lagoon via Las Virgenes Creek and Malibu Creek. This device filters 100% of the average dry weather flow observed in the storm drain and retains all solid pollutant larger than 0.25 inches. A pump unit is integrated with this filter system to bring the filtered water upwards several feet to the sub-surface level to an infiltration bed. Water in the infiltration unit infiltrates to the ground using an area of about 2,400 sq. ft.
- *Creek Clean-Ups* - The City hosts two annual community creek clean-up events in various accessible areas of Las Virgenes Creek.
- *Street Sweeping* - Weekly street sweeping takes place within the City's jurisdictional streets.

City of Hidden Hills

- *Street Sweeping* - The City conducts street sweeping of major thoroughfares, residential streets, and several parking lots on a weekly, bi-monthly, and monthly basis respectively.
- *Ordinances* - The City has enactment and enforcement of litter ordinances to reduce sources of trash within city jurisdictional areas.
- *Trash Receptacles* - The City has installed trash receptacles at two public transit locations.
- *Valet Waste Bins* - Waste bin services are available to reduce the accidental discharge of trash.
- *City Clean Up Services* - Home Owners Association maintenance and cleaning crews routinely clean the entire City area.
- *SUSUMP/Code Enforcement* - SUSMP and building code enforcement to ensure that building sites are being kept clean.

County of Los Angeles

- Existing County Code:
  - Title 13 Chapter 80 - Illegal Dumping ban in unincorporated County public lands and/or private land that is not designated for that disposal purpose.
  - Title 12 Chapter 80 - Stormwater and Runoff Pollution control ordinance which includes a ban on littering. This also includes signage for littering fines and penalties.
  - Title 17 Chapter 04.645 - Smoking ban in County Parks prohibited outside of designated smoking areas unless granted by the facilities manager and/or director.

- *Full Capture Devices* - The County installed Regional Board approved Full Capture Devices on 192 catch basin connector pipes throughout unincorporated County areas of Malibu Creek Watershed.
- *Storm Drain Markers* - All storm drains in unincorporated County are appropriately marked with a "no dumping" message.
- *Street Sweeping Program* - Street sweeping is conducted weekly in unincorporated areas of Malibu Creek Watershed that have curb and gutter.

City of Malibu

- Existing Ordinances:
  - No. 265 - Prohibiting Smoking on Beaches within the City of Malibu.
  - No. 286 - Ban of Polystyrene Food Packaging.
  - No. 323 - Ban the use of Plastic Shopping Bags by Retail Establishments within the City of Malibu.
  - No. 337 - Ban of Smoking in Outdoor Dining Areas and Public Events.
- *Malibu Municipal Code (MMC)* - The Malibu MMC Title 13 Chapter 13.04 includes the following definition of Pollutant in the City of Malibu Storm Water Management and Discharge Control Ordinance No. 157: ""Pollutant" means those "pollutants" defined in Section 502(6) of the Federal Clean Water Act (33 U.S.C. Section 1362(6)), or incorporated into California Water Code Section 13373. Examples of pollutants include, but are not limited to the following: 1.Commercial and industrial waste (such as fuels, solvents, detergents, **plastic pellets**, hazardous substances, fertilizers, pesticides, slag, ash, and sludge);"

  In addition the following section lists prohibitions.

  "13.04.060 - Prohibited activities.

  B. Littering. It is prohibited to deposit any refuse, rubbish, garbage, or any other discarded or abandoned objects or material in or upon any public or private property so that the same might enter the MS4. Refuse, rubbish or garbage intended for regular solid waste pick up and disposal shall be deposited in containers, bags or other appropriate receptacles and placed in designated locations in accordance with Chapter 8.32 of this code. No person shall throw or deposit litter in any body of water within the city that connects with the MS4, including fountains, ponds, lakes, or streams."

  This Chapter of the MMC, and others are enforceable through Ordinance 324 which established an administrative citation procedure to impose administrative fines for violations of the MMC.
- *Street Sweeping* - Pacific Coast Highway (PCH) twice a month (1st and 3rd Mondays of the month) and street sweeping within the City's jurisdictional streets near the Civic Center and Malibu Creek once a month (2nd Monday of the month).
- *Cross Creek Roadway Improvements* - This award-winning (American Public Works Association B.E.S.T Project of the year 2009) project helped relieve traffic congestion, attract pedestrians to downtown Malibu and improve ocean water quality through its use of environmentally sensitive construction techniques such as permeable pavers and native vegetation in landscaping. Before the improvements, Cross Creek Road was a congested street with no sidewalks or other amenities

to attract pedestrians. It often flooded and could discharge stormwater, trash and pollutants directly into Malibu Lagoon and Surfrider Beach because of its inadequate drainage. The project also included placement of trash containers along the walkways.

- *Civic Center Stormwater Treatment Facility(CCSTF)* - a 1,400 Gallon per minute filtration and disinfection unit installed in the Civic Center area which diverts runoff for treatment and dispersal on land instead of discharge to Malibu Creek. The three major drainage catchments in the Civic Center area are each treated through CDS type devices (two Aquaswirl and one Stormceptor) at each pump station prior to media filtration and disinfection by ozonation. *The Stormceptor was a pilot device installed prior to the construction of the CCSTF and incorporated into the project.
- *Legacy Park Project* - The City is currently constructing Legacy Park. Employing state-of-the-art technology, it is a central park that will work as an environmental cleaning machine, reducing pollution impacts in Malibu Creek, Malibu Lagoon, and Surfrider Beach, and will provide a living learning center for five coastal habitats. The park includes an 8 acre foot intermittent wetland which will act as storage for runoff beyond the existing capacity of the CCSTF. Some of the stormdrain infrastructure enhancements include installation of three stainless steel trash screens by Advanced Solutions in the drains. The Park will also include placement of trash and recycling containers along the walking paths and gathering areas.
- *Cross Creek Road Pilot Trash Excluder: Trash Guard* - The City installed a trash excluder in February 2010 in a catch basin on Cross Creek Road to test its effectiveness. Trash Guard® is a patented stormwater treatment device that captures debris, sediment and floatables. Its function is identical to the CPS designs used by the County of Los Angeles for several years. The Trash Guard® has been tailored to meet "full trash capture" specifications and requirements. All screen holes are 3/16" (4.7625 mm) diameter. The City of San Francisco just approved this device for their Trash TMDL.
- *Trash and Recycle Container Installations at Bus Stops and in a Commercial Area Adjacent to Malibu Creek* - The City helped to purchase recycle bins with a grant from the State for a commercial plaza adjacent to the Creek. This allowed the property owner to commit funds to purchase more trash containers, helping to prevent litter. The City intends to continue similar partnerships with other commercial areas. In addition, the City placed trash containers at all bus stops in its jurisdiction.
- *Clean Bay Restaurant Certification Program* - The City implemented the Clean Bay Restaurant Certification Program in 2009 to encourage businesses to be proactive in protecting water quality by doing more than just the minimum requirements for pollution prevention. Criteria include proper trash and litter control, surface cleaning, and a recycling program.
- *Storm Drain Marking* - All storm drain inlets which drain to the Malibu Creek are stenciled with a "*No Dumping. Drains to Ocean.*" message.
- *Catch Basin Cleaning* - The City maintains and cleans all catch basins in the City's right of way at least annually and quarterly in the Civic Center area which would discharge to Malibu Creek if it weren't diverted to the CCSTF.

City of Westlake Village

- *Street Sweeping* - The City conducts street sweeping citywide on a weekly basis.
- *Daily Trash Collection* - City public works staff conduct trash collections in the public right-of-way daily.
- *Ordinances* - The City has enactment and enforcement of litter ordinances to reduce sources of trash within city jurisdictional areas.
- *Trash Receptacles* - The City has installed trash receptacles at all bus stops, and public gathering areas.
- *Catch Basin Cleaning and Maintenance*- All City owned and maintained catch basins are cleaned annually and stenciled with a "No dumping – Drains to Lake" message.
- *Trash/Debris Capture Devices* - The City has retrofitted 25 priority catch basins in mechanical trash excluders and eight debris basin standpipes with filter fabric. By way of SUSMP conditioning, several trash mitigation structural BMPs have been installed throughout the City; such as CDS and clarifier devices.

BMP EFFECTIVENESS ASSESSMENT AND MFAC/BMP REVISION PROCESS

The suite of BMPs listed above represents the initial BMP program for the responsible parties participating in the development of this TMRP. The first year of the TMRP will provide a basis for information on the current levels of trash in the Malibu Creek Watershed that will be used to evaluate the effectiveness of BMP implementation during subsequent years. Monitoring data from both CMS and any GAS will be utilized for this effort. Responsible parties may locate GAS at strategic locations in the Watershed, but the decision will be at the discretion of the responsible party. The following process will be used to document the implementation of BMPs and identify their effectiveness:

1. Identification of the BMP (i.e., street sweeping, trash collection, trash cans, full or partial capture device) and general location(s) of the activity.
2. Documentation of the time frame for specific BMPs (i.e., when the activity was initiated or when device was installed, frequency of activity if applicable).
3. Assessment of the number and types of BMPs occurring in the drainage area for each of the monitoring locations.
4. Comparison of monitoring results between monitoring locations (i.e. comparing types and numbers of BMPs and the volumes of trash accumulated across the drainage areas).
5. Comparison of monitoring results between events before and after BMP implementation.

An attempt will be made to assess differences between trash levels at monitoring sites with BMPs in the associated drainages and monitoring sites without BMPs. By comparing and contrasting sites with BMPs to those without, responsible parties may be able to identify which BMPs are most effective and/or where additional BMP implementation may be needed. Additionally, as BMPs are implemented during the monitoring period, trash levels before and after BMP implementation will be assessed to determine effectiveness.

Subsequently, to measure the effectiveness of BMPs over a period of time, attempts will be made to determine if a correlation exists between the amount of trash collected at a site to the number (and type) of BMPs being implemented between each event at or near that site. By identifying a decrease in the total amount of trash collected from each event, it can then be determined that the BMP(s) is working effectively. Conversely, if an increase in total trash accumulation is observed, then additional and/or more effective BMPs will be considered.

The monitoring data can also be utilized to identify the most effective BMPs to assist in meeting the zero trash goal. By characterizing the types of trash and identifying the source it may be possible to see which BMPs will also be the most effective for targeting specific sources in the Watershed. This evaluation can also be used to prioritize sites for FCS installation for point sources where appropriate.

Finally, the monitoring data will be used to identify high trash generating areas to prioritize locations for additional BMPs. Sites that show consistently higher levels of trash accumulating in deleterious amounts when compared to other sites within the Watershed may be considered high trash areas. Using the monitoring information and any information generated through other programs, responsible agencies will work to better identify these areas and utilize methods, including but not limited to site investigations, review of existing data, and/or computer mapping to formally identify and track these areas.

After the first year of monitoring, the BMP effectiveness evaluation discussed above will be used to propose recommendations for additional BMP implementation and modifications to the MFAC program for nonpoint sources. The information will be used to develop a revised MFAC/BMP program (if necessary). The revised MFAC/BMP program will include any needed revisions to the TMRP to better assess BMP effectiveness.

POINT SOURCE PRIORITIZATION

The first year TMRP will also be utilized for point sources to help identify areas for prioritization of FCS, PCS, or other BMP Programs. By utilizing the above strategy, responsible parties will be able to identify areas deemed appropriate for FCS, PCS or other BMP Programs. Monitoring data will be used to identify high trash generation areas and allow for scheduling of installation of devices as required in the BPA. A plan for point sources will be prepared that outlines their proposed FCS installation schedule and/or PCS/BMP program, which will be included in the annual monitoring report. Inclusion and consideration of these point source plans may result in revisions to the monitoring schedule or monitoring location prioritization in subsequent annual monitoring reports.

Figure 1. Overview of the Malibu Creek Watershed with TMRP Areas Covered by This Plan

Figure 2. Malibu Lagoon and Malibu Creek TMRP Areas and Compliance Monitoring Sites

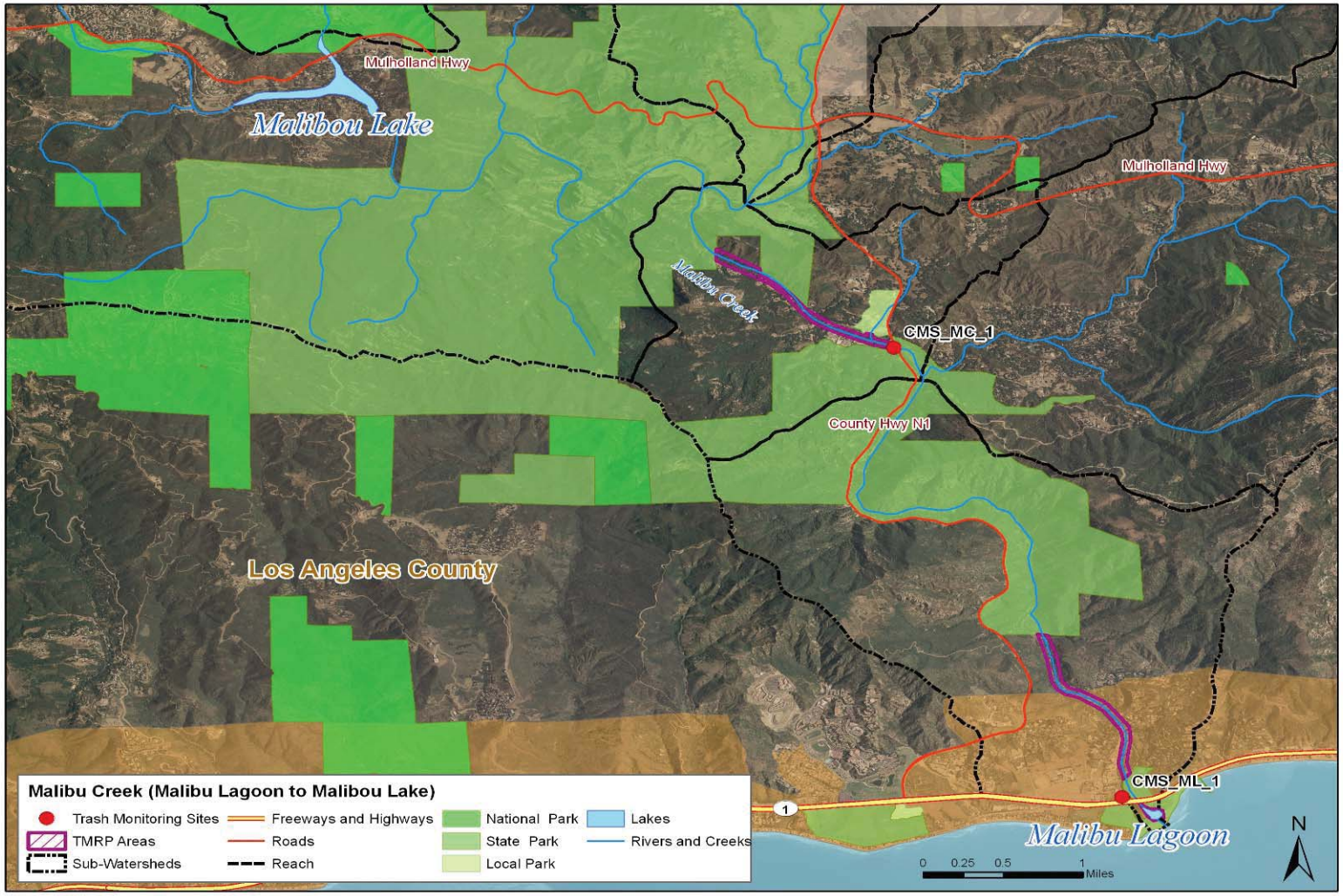


Figure 3. Las Virgenes Creek TMRP Areas and Compliance Monitoring Sites

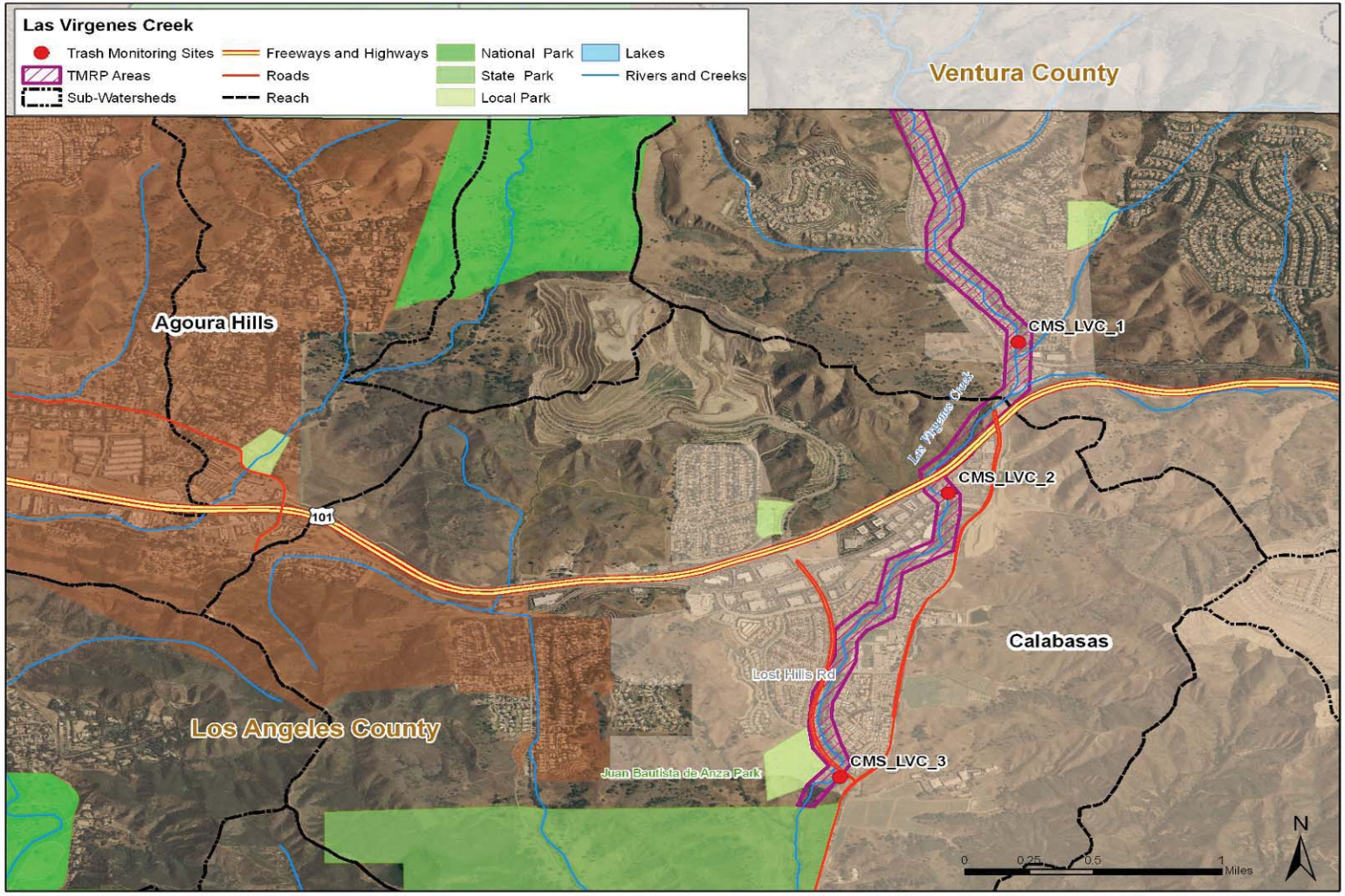
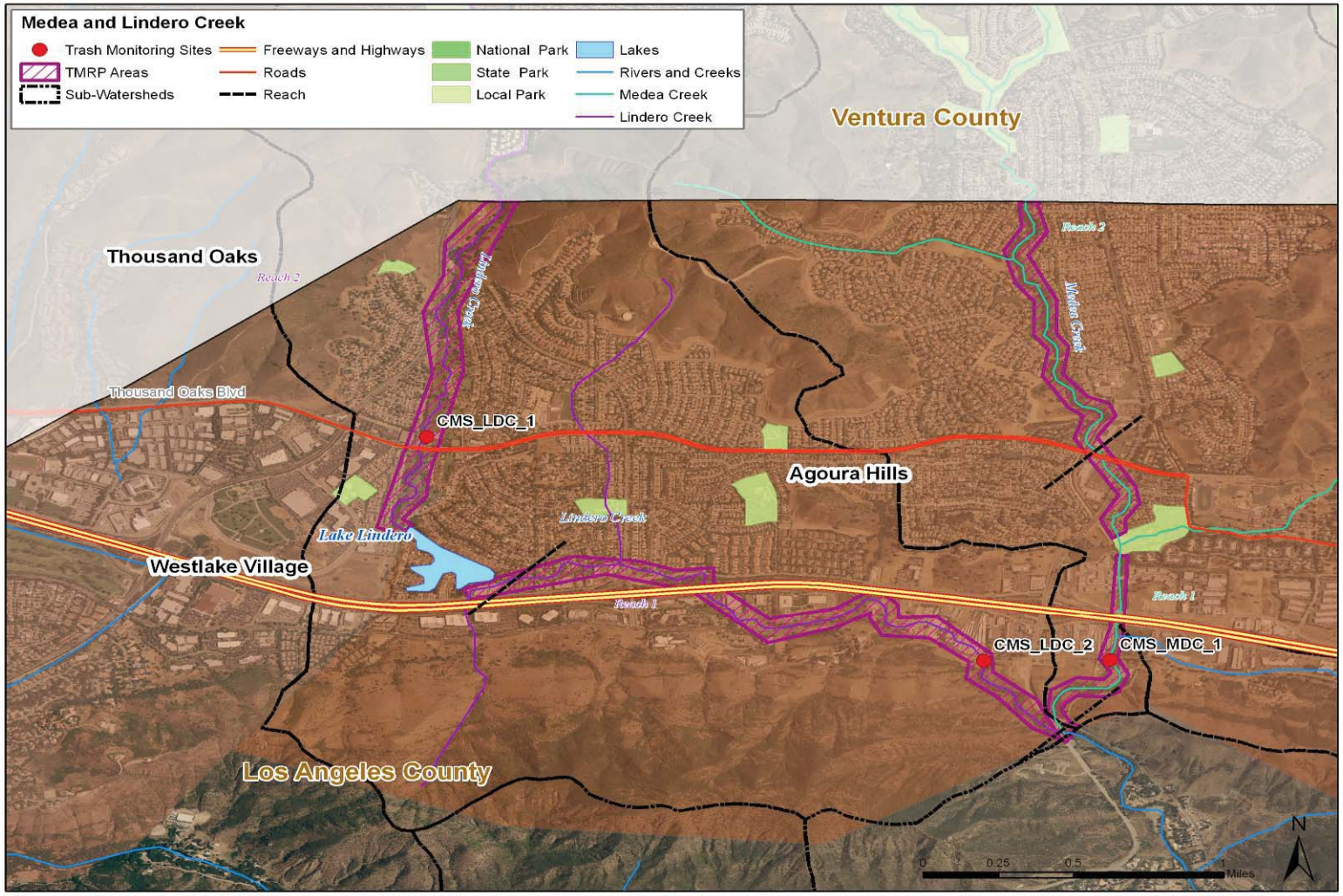


Figure 4. Lindero and Madea Creeks TMRP Areas and Compliance Monitoring Sites



Appendix A Trash Assessment Worksheet

Malibu Creek Watershed Trash Assessment Worksheet		
Watershed/Stream:	Date:	Start Time:
Monitoring Staff:	Site ID:	End Time:
Total Pieces In Stream:	Total Pieces On Banks:	Grand Total Trash:
Volume (# trash bags):	Weight (lbs): In Stream- On Banks-	Total Weight Outside Site (lbs):
Width Right Bank (ft):	Width Left Bank (ft):	Photo #'s (from camera)
Dumped %	Hazardous Waste Log (Y/N)	Intractable Trash Log (Y/N)

Trash Item Tally: Tally with (|)

Plastic/Styrofoam:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Paper Products/ Biodegradable:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Household items:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Landscape Materials:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Aluminum/Metal:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Automotive:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Toxic/Hazardous Material:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Glass:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Bio/Hazardous:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Personal Effects:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Sports Equipment:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Miscellaneous:	# In Stream:	# On Banks:		Source I.D.	% Algae	Wear & Tear
Specific Description of Items Found:						
Other Observations:						

Debris Source / Identification

a. Aquafina
b. Arrowhead
c. Bud Light
d. Budweiser
e. Burger King
f. Carl's Jr.
g. Cheetos
h. Circle K
i. Coke (Coca Cola Co.)
j. Coors
k. Corona
l. Doritos
m. Evian
n. Fritos
o. Gatorade
p. Jack in the Box
q. Keystone
r. KFC
s. Kmart
t. Lifestyles
u. Marlboro
v. Miller
w. M & M's
x. McDonald's
y. Natural Light
z. Papa Johns Pizza
aa. Pepsi. Co.
bb. Pollo Loco
cc. PowerAde
dd. Ralph's
ee. Red Bull
ff. Rite Aide
gg. Round Table Pizza
hh. Shasta
ii. Snickers
jj. Sprite
kk. Starbucks
ll. Taco Bell
mm.Toppers
nn. Vons/Safeway
oo. Wal-Mart
pp. 99 cent Store Only
qq. Unmarked Bags
rr. Unmarked Cups
ss. Unmarked food containers
tt. Unmarked water bottles
uu. Unknown Source

Additional Items:

Appendix B Hazardous Material/Intractable Waste Log

Hazardous Material/ Intractable Waste Log

Watershed/Stream:	Date:
Monitoring Staff:	

Description of Object	
Unique Identification Number (Example would be HM_S1_001)*	
GPS Coordinates	
Picture #'s	
Previously Identified Item? (Y/N)	
Additional Information	

* HM = Hazardous Material
* IT = Intractable Waste
S# = Site Identification (e.g., Site 1, Site 2)
001 = Item Number

Appendix H – Water Toxicity Testing and TIE Approach

Water Toxicity Testing and Toxicity Identification Evaluations

Aquatic toxicity testing supports the identification of best management practices (BMPs) to address sources of toxicity in urban runoff. The following outlines the approach for conducting aquatic toxicity monitoring and evaluating results. Control measures and management actions to address confirmed toxicity caused by urban runoff are addressed by the EWMP, either via currently identified management actions or those that are identified via adaptive management of the EWMP.

The approach to conducting aquatic toxicity monitoring is presented in Figure H-1, which describes a general evaluation process for each sample collected as part of routine sampling conducted twice per year in wet weather and once per year in dry weather. Monitoring begins in the receiving water and the information gained is used to identify constituents for monitoring at outfalls to support the identification of pollutants that need to be addressed in the EWMP. The sub-sections below describe the process and its technical and logistical rationale.

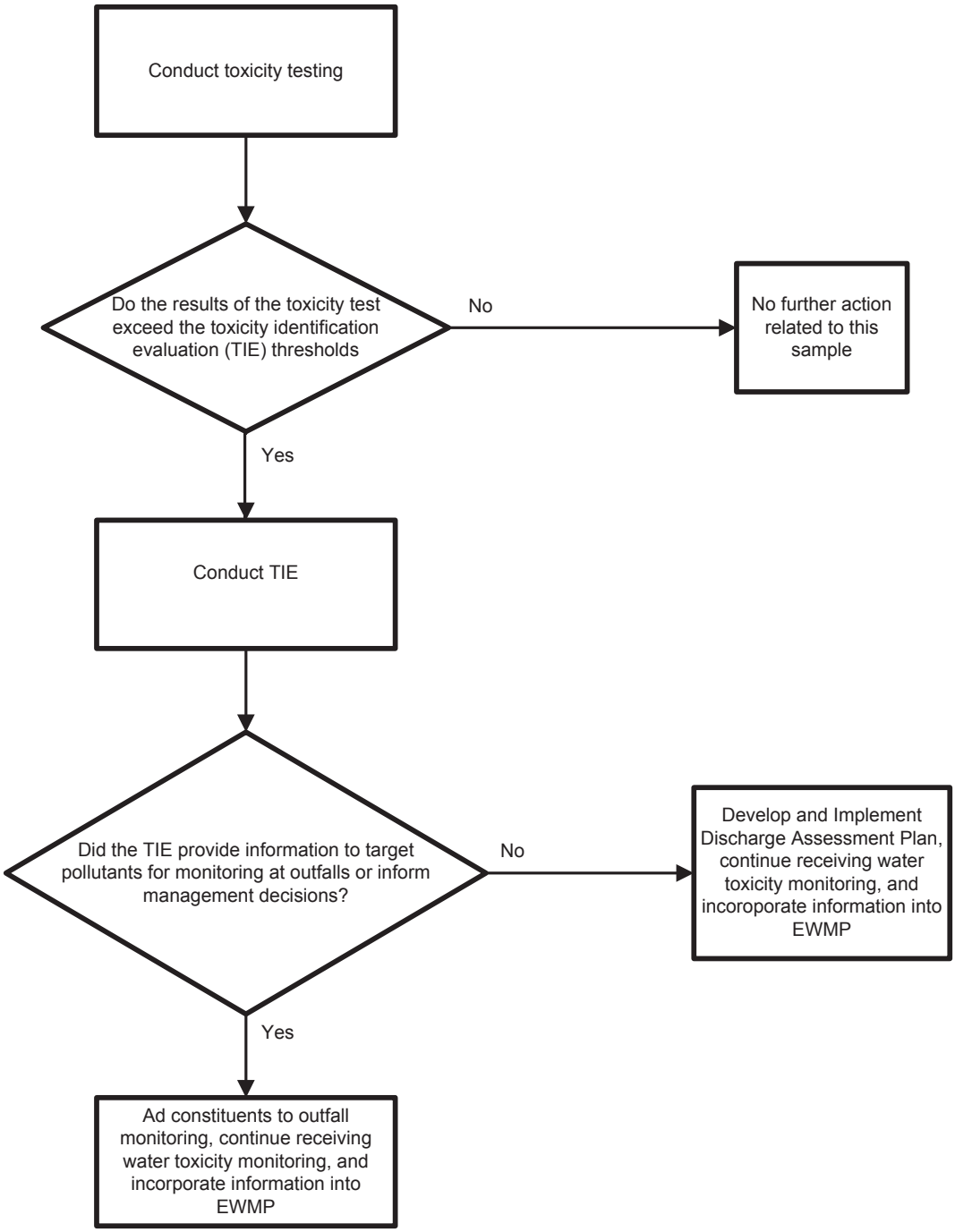


Figure H-1: Generalized Aquatic Toxicity Assessment Process

Sensitive Species Selection

The Permit Monitoring and Reporting Program (MRP) (page E-32) states that a sensitivity screening to select the most sensitive test species should be conducted unless "a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring shall be conducted using only that test species." Previous relevant studies conducted in the watershed should be considered. Such studies may have been completed via previous MS4 sampling, wastewater NPDES sampling, or special studies conducted within the watershed. The following sub-sections discuss the species section process for assessing aquatic toxicity in receiving waters.

Freshwater Sensitive Species Selection

If samples are collected in receiving waters with salinity <1 ppt, or from outfalls discharging to receiving waters with salinity <1 ppt, then the Permittee(s) shall conduct the following critical life stage chronic toxicity tests on undiluted samples in accordance with species and short-term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136). In no case shall the following test species be substituted with another organism unless written authorization from the Regional Water Board Executive Officer is received.

a. A static renewal toxicity test with the fathead minnow, Pimephales promelas (Larval Survival and Growth Test Method 1000.04).
b. A static renewal toxicity test with the daphnid, Ceriodaphnia dubia (Survival and Reproduction Test Method 1002.05).
c. A static renewal toxicity test with the green alga, Selenastrum capricornutum (also named Raphidocelis subcapitata) (Growth Test Method 1003.0).

Freshwater Testing Periods

As wet weather conditions in the region generally persist for less than the acute and chronic testing periods (typically 48 hours and 7 days, respectively), the shorter of the two testing methods, in the case of *C. dubia* acute testing measuring survival, will be used for wet weather toxicity testing. Conducting chronic tests on wet weather samples generates results that are not representative of the conditions found in the receiving water intended to be simulated by toxicity testing. Acute toxicity tests are used to be consistent with the relatively shorter exposure periods of species in the watershed to potential toxicants introduced by urban runoff during storm events. Acute testing to assess survival endpoints will be conducted in accordance with *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA, 2002b).

Chronic toxicity tests will be used to assess both survival and reproductive/growth endpoints for *C. dubia* in dry weather samples. Chronic testing will be conducted on undiluted samples in accordance with *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (USEPA, 2002a).

Marine and Estuarine Test Species and Methods

If samples are collected in receiving waters with salinity >1 ppt, or from outfalls discharging to receiving waters with salinity >1 ppt, then the Permittee(s) shall conduct the following critical life stage chronic toxicity tests on undiluted samples in accordance with species and short-term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA/600/R-95/136, 1995). Artificial sea salts shall be used to increase

sample salinity. In no case shall the following test species be substituted with another organism unless written authorization from the Regional Water Board Executive Officer is received.

a. A static renewal toxicity test with the topsmelt, Atherinops affinis (Larval Survival and Growth Test Method 1006.015);
b. A static non-renewal toxicity test with the purple sea urchin, Strongylocentrotus purpuratus (Fertilization Test Method 1008.0); and
c. A static non-renewal toxicity test with the giant kelp, Macrocystis pyrifera (Germination and Growth Test Method 1009.0).

Toxicity Endpoint Assessment and Toxicity Identification Evaluation Triggers

Acute and chronic toxicity test endpoints will be analyzed, per the MRP, using the Test of Significant Toxicity (TST) t-test approach specified by the USEPA (USEPA, 2010). The Permit specifies that the chronic in-stream waste concentration (IWC) is set at 100% receiving water for receiving water samples and 100% effluent for outfall samples. Using the TST approach, a t-value is calculated for a test result and compared with a critical t-value from USEPA's TST Implementation Document (USEPA, 2010). Follow-up triggers are generally based on the Permit specified statistical assessment as described below.

For acute C. dubia toxicity testing, if a statistically significant 50% difference in mortality is observed between the sample and laboratory control, a toxicity identification evaluation (TIE) will be performed. TIE procedures are discussed in detail in the following section. Experience conducting TIEs in receiving waters in the region supports using a 50% mortality trigger to provide a reasonable opportunity for a successful TIE. During TMDL monitoring in the Calleguas Creek Watershed (CCW) in 2003 and 2004, TIEs were initiated on samples exceeding the 50% threshold (the majority of which displayed 100% mortality. In that study, toxicity degraded in approximately 40% of the samples on which TIE procedures were conducted making the TIE unsuccessful (and effectively useless in pinpointing specific toxicants). The Los Angeles Regional Board approved monitoring program for the CCW Toxicity TMDL uses a 50% threshold for TIE initiation. Additionally, a 50% mortality threshold is used in the Ventura County MS4 Permit.

For chronic C. dubia toxicity testing, if a statistically significant 50% difference in mortality is observed between the sample and laboratory control, a TIE will be performed. If a statistically significant 50% difference in a sub-lethal endpoint is observed between the sample and laboratory control, a confirmatory sample will be collected from the receiving water within two weeks of obtaining the results of the initial sample. If a statistically significant 50% difference in mortality or sub-lethal endpoint is observed between the sample and laboratory control on the confirmatory sample, a TIE will be performed.

For the chronic marine and estuarine tests, the percent effect will be calculated. The percent effect is defined as the difference between the mean control response and the mean IWC response divided by the control response, multiplied by 100. A TIE will be performed if the percent effect value is equal to or greater than 50%.

TIE procedures will be initiated as soon as possible after the toxicity trigger threshold is observed to reduce the potential for loss of toxicity due to extended sample storage. If the cause of toxicity is readily apparent or is caused by pathogen related mortality (PRM) or epibiont interference with the test, the result will be rejected, if necessary, a modified testing procedure will be developed for future testing.

In cases where significant endpoint toxicity effects greater than 50% are observed in the original sample, but the follow-up TIE positive control "signal" is not statistically significant, the cause of toxicity will be considered non-persistent. No immediate follow-up testing is required on the sample. However, future

test results should be evaluated to determine if parallel TIE treatments are necessary to provide an opportunity to identify the cause of toxicity

Toxicity Identification Evaluation Approach

The results of toxicity testing will be used to trigger further investigations to determine the cause of observed laboratory toxicity. The primary purpose of conducting TIEs is to support the identification of management actions that will result in the removal of pollutants causing toxicity in receiving waters. Successful TIEs will direct monitoring at outfall sampling sites to inform management actions. As such, the goal of conducting TIEs is to identify pollutant(s) that should be sampled during outfall monitoring so that management actions can be identified to address the pollutant(s).

The TIE approach is divided into three phases as described in USEPA's 1991 Methods for Aquatic Toxicity Identification and briefly summarized as follows:

- Phase I uses methods to characterize the physical/chemical nature of the constituents which cause toxicity. Such characteristics as solubility, volatility and filterability are determined without specifically identifying the toxicants. Phase I results are intended as a first step in specifically identifying the toxicants but the data generated can also be used to develop treatment methods to remove toxicity without specific identification of the toxicants.
- Phase II uses methods to specifically identify toxicants.
- Phase III uses methods to confirm the suspected toxicants.

A Phase I TIE will be conducted on samples that exceed a TIE trigger described in Section 6.4.2. Water quality data will be reviewed to future support evaluation of potential toxicants. TIEs will perform the manipulations described in Table 19. TIE methods will generally adhere to USEPA procedures documented in conducting TIEs (USEPA, 1991, 1992, 1993a-b).

Table H-1: Toxicity Identification Evaluation sample manipulations

TIE Sample Manipulation	Expected Response
pH Adjustment (pH 7 and 8.5)	Alters toxicity in pH sensitive compounds (i.e., ammonia and some trace metals)
Filtration or centrifugation	Removes particulates and associated toxicants
Ethylenedinrilo-Tetraacetic Acid (EDTA)	Chelates trace metals, particularly divalent cationic metals
Sodium thiosulfate (STS) addition	Reduces toxicants attributable to oxidants (i.e., chlorine) and some trace metals
Piperonyl Butoxide (PBO)	Reduces toxicity from organophosphate pesticides such as diazinon, chlorpyrifos and malathion, and enhances pyrethroid toxicity
Carboxylesterase addition[1]	Hydrolyzes pyrethroids
Solid Phase Extraction (SPE) with C18 column	Removes non-polar organics (including pesticides) and some relatively non-polar metal chelates
Sequential Solvent Extraction of C18 column	Further resolution of SPE-extracted compounds for chemical analyses
No Manipulation	Baseline test for comparing the relative effectiveness of other manipulations

[1] Carboxylesterase addition has been used in recent studies to help identify pyrethroid-associated toxicity (Wheelock et al., 2004; Weston and Amweg, 2007). However, this treatment is experimental in nature and should be used along with other pyrethroid-targeted TIE treatments (e.g., PBO addition).

The Watershed Management Group will identify the cause(s) of toxicity using the treatments in Table 18 and, if possible, using the results of water column chemistry analyses. After any initial determinations of the cause of toxicity, the information may be used during future events to modify the targeted treatments to more closely target the expected toxicant or to provide additional treatments to narrow the toxicant cause(s). Moreover, if the toxicant or toxicant class is not initially identified, toxicity monitoring during subsequent events will confirm if the toxicant is persistent or a short-term episodic occurrence.

As the primary goals of conducting TIEs is to identify pollutants for incorporation into outfall monitoring, narrowing the list of toxicants following Phase I TIEs via Phase II or III TIEs is not necessary if the toxicant class determined during the Phase I TIE is sufficient for 1) identifying additional pollutants for outfall monitoring and/or 2) identifying control measures. Thus, if the specific pollutant(s) or the analytical class of pollutant (e.g., metals that are analyzed via EPA Method 200.8) are identified then sufficient information is available to inform the addition of pollutants to outfall monitoring.

Phase II TIEs may be used to identify specific constituents causing toxicity in a given sample if information beyond what is gained via the Phase I TIE and review of chemistry data provide is needed to identify constituents to monitor or management actions. Phase III TIEs will be conducted following any Phase II TIEs.

For determining whether a TIE is inconclusive, TIEs will be considered inconclusive if:

- The toxicity is persistent (i.e., observed in the positive control), and
- The cause of toxicity cannot be attributed to a class of constituents (e.g., insecticides, metals, etc.) that can be targeted for monitoring.

If a combination of causes that act in a synergistic or additive manner are identified, or if the toxicity can be removed with a treatment or via a combination of the TIE treatments or the analysis of water quality data collected during the same event identify the pollutant or analytical class of pollutants, the result of a TIE is considered conclusive.

Note that the MRP (page E-33) allows a TIE Prioritization Metric (as described in Appendix E of the Stormwater Monitoring Coalition's Model Monitoring Program) for use in ranking sites for TIEs. However, as the extent to which TIEs will be conducted is unknown, prioritization cannot be conducted at this time. However, prioritization may be used in the future based on the results of toxicity monitoring and an approach to prioritization will be developed through the CIMP adaptive management process and will be described in future versions of the CIMP.

Discharge Assessment

The Watershed Management Group will prepare a Discharge Assessment Plan if TIEs conducted on consecutive sampling events are inconclusive. The discharge assessment will be conducted after consecutive inconclusive TIEs, rather than after one, because of the inherit variability associated with the toxicity and TIE testing methods.

The Discharge Assessment Plan will consider the observed potential toxicants in the receiving water and associated urban runoff discharge above known species effect levels and the relevant exposure periods compared to the duration of the observed toxicity. The Discharge Assessment Plan will identify:

- If desired, additional receiving water toxicity monitoring to be conducted to further evaluate the spatial extent of receiving water toxicity.
- The test species to be used. If a species is proposed that is different than the species used when receiving water toxicity was observed, justification for the substitution will be provided.

- The number and location of monitoring sites and their spatial relation to the observed receiving water toxicity.
- The number of monitoring events that will be conducted, a schedule for conducting the monitoring, and a process for evaluating the completion of the assessment monitoring.

The Discharge Assessment Plan will be submitted to Los Angeles Regional Board staff for comment within 60 days of receipt of notification of the second consecutive inconclusive result. If no comments are received within 30-days, it will be assumed that the approach is appropriate for the given situation and the Plan should be implemented within 90-days of submittal.

Follow Up on Toxicity Testing Results

The MRP (page E-33) indicates the following actions should be taken when a toxicant or class of toxicants is identified through a TIE:

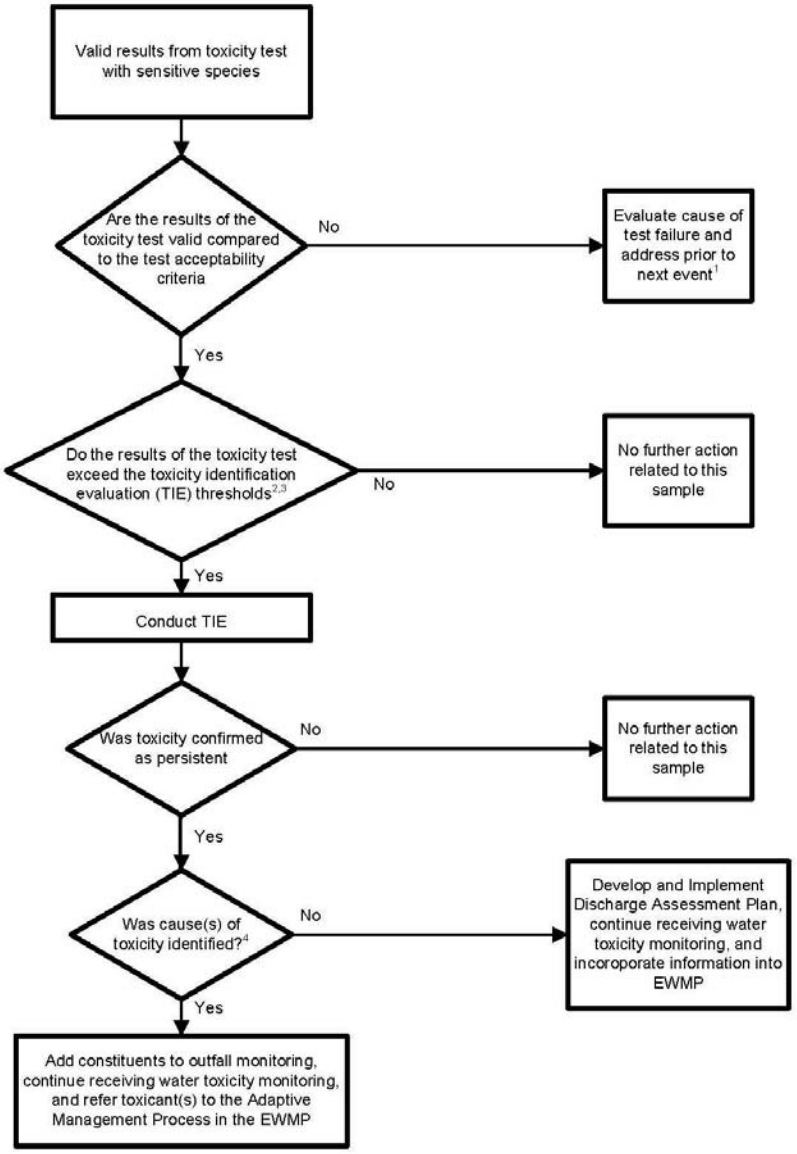
1. Group Members shall analyze for the toxicant(s) during the next scheduled sampling event in the discharge from the outfall(s) upstream of the receiving water location.
2. If the toxicant is present in the discharge from the outfall at levels above the applicable receiving water limitation, a toxicity reduction evaluation (TRE) will be performed for that toxicant.

The list of constituents monitored at outfalls identified in the CIMP will be modified based on the results of the TIEs. Monitoring for those constituents will occur as soon as feasible following the completion of a successful TIE (i.e., the next monitoring event that is at least 45 days following the toxicity laboratory's report transmitting the results of a successful TIE).

The requirements of the TREs will be met as part of the adaptive management process in the EWMPs rather than conducted via the CIMP. The identification and implementation of control measures to address the causes of toxicity are tied to management of the stormwater program, not the CIMP. It is expected that the requirements of TREs will only be conducted for toxicants that are not already addressed by an existing Permit requirement (i.e., TMDLs) or existing or planned management actions.

Summary of Aquatic Toxicity Monitoring

The approach to conducting aquatic toxicity monitoring as described in the previous sections is summarized in detail in Figure H-2. The intent of the approach is to identify the cause of toxicity observed in receiving water to the extent possible with the toxicity testing tools available, thereby directing outfall monitoring for the pollutants causing toxicity with the ultimate goal of supporting the development and implementation of management actions.



Footnotes

1. Test failure includes pathogen or epibiont interference, which should be addressed prior to the next toxicity sampling event.
2. For freshwater, the TIE threshold is >50% mortality in an acute (wet weather) or chronic (dry weather) sample. If a >50% effect in a sub-lethal endpoint for chronic test is observed, a follow up sample will be collected within two weeks of the completion of the initial sample collection. If the follow up sample exhibits a greater than 50% effect, a TIE will be initiated.
3. For marine and estuarine waters, the TIE threshold is a percent effect value of equal to or greater than 50 percent. Follow up samples will be collected within two weeks of the completion of the initial sample collection and a TIE initiated.
4. The goal of conducting the Phase I TIE is to identify the cause of toxicity so that outfall monitoring can incorporate the toxicant(s) into the list of constituents monitored during outfall monitoring. Thus if the specific toxicant(s) or the analytical class of toxicants (i.e., metals that are analyzed via EPA Method 200.8) are identified sufficient information is available to inform the addition of pollutants to the list of pollutants monitored during outfall monitoring.

Figure H-2: Detailed Aquatic Toxicity Assessment Process

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Appendix I – Stormwater Monitoring Program Constituents with Associated Minimum Levels

Table I-1: Stormwater Monitoring Program Constituents with Associated Minimum Levels

(From Table E-2 in Attachment E of the MS4 Permit)

Constituents	Type	MLs[15]	Units
Oil and Grease	Conventional Pollutants	5	mg/L
Total Phenols	Conventional Pollutants	0.1	mg/L
Cyanide	Conventional Pollutants	0.005	mg/L
pH	Conventional Pollutants	0 – 14	mg/L
Temperature	Conventional Pollutants	N/A	mg/L
Dissolved Oxygen	Conventional Pollutants	Sensitivity to 5 mg/L	mg/L
Total coliform (marine waters)	Bacteria (single sample limits)	10,000	MPN/100ml
Enterococcus (marine waters)	Bacteria (single sample limits)	104	MPN/100ml
Fecal coliform (marine & fresh waters)	Bacteria (single sample limits)	400	MPN/100ml
E. coli (fresh waters)	Bacteria (single sample limits)	235	MPN/100ml
Dissolved Phosphorus	General	0.05	mg/L
Total Phosphorus	General	0.05	mg/L
Turbidity	General	0.1 NTU	mg/L
Total Suspended Solids	General	2	mg/L
Total Dissolved Solids	General	2	mg/L
Volatile Suspended Solids	General	2	mg/L
Total Organic Carbon	General	1	mg/L
Total Petroleum Hydrocarbon	General	5	mg/L
Biochemical Oxygen Demand	General	2	mg/L
Chemical Oxygen Demand	General	20-900	mg/L
Total Ammonia-Nitrogen	General	0.1	mg/L
Total Kjeldahl Nitrogen	General	0.1	mg/L
Nitrate-Nitrite	General	0.1	mg/L
Alkalinity	General	2	mg/L
Specific Conductance	General	1 ohm/cm	mg/L
Total Hardness	General	2	mg/L
MBAS	General	0.5	mg/L
Chloride	General	2	mg/L
Fluoride	General	0.1	mg/L
Methyl tertiary butyl ether (MTBE)	General	1	mg/L
Perchlorate	General	4 µg/L	mg/L
Aluminum	Metals (Dissolved & Total)	100	µg/L
Antimony	Metals (Dissolved & Total)	0.5	µg/L
Arsenic	Metals (Dissolved & Total)	1	µg/L
Beryllium	Metals (Dissolved & Total)	0.5	µg/L
Cadmium	Metals (Dissolved & Total)	0.25	µg/L
Chromium (total)	Metals (Dissolved & Total)	0.5	µg/L
Chromium (Hexavalent)	Metals (Dissolved & Total)	5	µg/L
Copper	Metals (Dissolved & Total)	0.5	µg/L
Iron	Metals (Dissolved & Total)	100	µg/L
Lead	Metals (Dissolved & Total)	0.5	µg/L
Mercury	Metals (Dissolved & Total)	0.5	µg/L

[15] MLs are established at the lowest applicable water quality objective or method detection limit by the permit. If monitoring at a site detects levels above the ML, the parameter shall be analyzed at that site for the remainder of the effective period of the permit.

Constituents	Type	MLs[15]	Units
Nickel	Metals (Dissolved & Total)	1	µg/L
Selenium	Metals (Dissolved & Total)	1	µg/L
Silver	Metals (Dissolved & Total)	0.25	µg/L
Thallium	Metals (Dissolved & Total)	1	µg/L
Zinc	Metals (Dissolved & Total)	1	µg/L
2-Chlorophenol	Semivolatile Organic Compounds (Acids)	2	µg/L
4-Chloro-3-methylphenol	Semivolatile Organic Compounds (Acids)	1	µg/L
2,4-Dichlorophenol	Semivolatile Organic Compounds (Acids)	1	µg/L
2,4-Dimethylphenol	Semivolatile Organic Compounds (Acids)	2	µg/L
2,4-Dinitrophenol	Semivolatile Organic Compounds (Acids)	5	µg/L
2-Nitrophenol	Semivolatile Organic Compounds (Acids)	10	µg/L
4-Nitrophenol	Semivolatile Organic Compounds (Acids)	5	µg/L
Pentachlorophenol	Semivolatile Organic Compounds (Acids)	2	µg/L
Phenol	Semivolatile Organic Compounds (Acids)	1	µg/L
2,4,6-Trichlorophenol	Semivolatile Organic Compounds (Acids)	10	µg/L
Acenaphthene	Semivolatile Organic Compounds (Base/Neutral)	1	µg/L
Acenaphthylene	Semivolatile Organic Compounds (Base/Neutral)	2	µg/L
Anthracene	Semivolatile Organic Compounds (Base/Neutral)	2	µg/L
Benzidine	Semivolatile Organic Compounds (Base/Neutral)	5	µg/L
1,2 Benzanthracene	Semivolatile Organic Compounds (Base/Neutral)	5	µg/L
Benzo(a)pyrene	Semivolatile Organic Compounds (Base/Neutral)	2	µg/L
Benzo(g,h,i)perylene	Semivolatile Organic Compounds (Base/Neutral)	5	µg/L
3,4 Benzoflouranthene	Semivolatile Organic Compounds (Base/Neutral)	10	µg/L
Benzo(k)flouranthene	Semivolatile Organic Compounds (Base/Neutral)	2	µg/L
Bis(2-Chloroethoxy) methane	Semivolatile Organic Compounds (Base/Neutral)	5	µg/L
Bis(2-Chloroisopropyl) ether	Semivolatile Organic Compounds (Base/Neutral)	2	µg/L
Bis(2-Chloroethyl) ether	Semivolatile Organic Compounds (Base/Neutral)	1	µg/L
Bis(2-Ethylhexl) phthalate	Semivolatile Organic Compounds (Base/Neutral)	5	µg/L
4-Bromophenyl phenyl ether	Semivolatile Organic Compounds (Base/Neutral)	5	µg/L
Butyl benzyl phthalate	Semivolatile Organic Compounds (Base/Neutral)	10	µg/L
2-Chloroethyl vinyl ether	Semivolatile Organic Compounds (Base/Neutral)	1	µg/L
2-Chloronaphthalene	Semivolatile Organic Compounds (Base/Neutral)	10	µg/L

Constituents	Type	MLs[15]	Units
4-Chlorophenyl phenyl ether	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
Chrysene	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
Dibenzo(a,h)anthracene	Semivolatile Organic Compounds (Base/ Neutral)	0.1	µg/L
1,3-Dichlorobenzene	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
1,4-Dichlorobenzene	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
1,2-Dichlorobenzene	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
3,3-Dichlorobenzidine	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
Diethyl phthalate	Semivolatile Organic Compounds (Base/ Neutral)	2	µg/L
Dimethyl phthalate	Semivolatile Organic Compounds (Base/ Neutral)	2	µg/L
di-n-Butyl phthalate	Semivolatile Organic Compounds (Base/ Neutral)	10	µg/L
2,4-Dinitrotoluene	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
2,6-Dinitrotoluene	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
4,6 Dinitro-2-methylphenol	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
1,2-Diphenylhydrazine	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
di-n-Octyl phthalate	Semivolatile Organic Compounds (Base/ Neutral)	10	µg/L
Fluoranthene	Semivolatile Organic Compounds (Base/ Neutral)	0.05	µg/L
Fluorene	Semivolatile Organic Compounds (Base/ Neutral)	0.1	µg/L
Hexachlorobenzene	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
Hexachlorobutadiene	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
Hexachloro-cyclopentadiene	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
Hexachloroethane	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
Indeno(1,2,3-cd)pyrene	Semivolatile Organic Compounds (Base/ Neutral)	0.05	µg/L
Isophorone	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
Naphthalene	Semivolatile Organic Compounds (Base/ Neutral)	0.2	µg/L
Nitrobenzene	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
N-Nitroso-dimethyl amine	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
N-Nitroso-diphenyl amine	Semivolatile Organic Compounds (Base/ Neutral)	1	µg/L
N-Nitroso-di-n-propyl amine	Semivolatile Organic Compounds (Base/ Neutral)	5	µg/L
Phenanthrene	Semivolatile Organic Compounds (Base/ Neutral)	0.05	µg/L
Pyrene	Semivolatile Organic Compounds (Base/ Neutral)	0.05	µg/L

Constituents	Type	MLs[15]	Units
1,2,4-Trichlorobenzene	Semivolatile Organic Compounds (Base/Neutral)	1	µg/L
Aldrin	Chlorinated Pesticides	0.005	µg/L
alpha-BHC	Chlorinated Pesticides	0.01	µg/L
beta-BHC	Chlorinated Pesticides	0.005	µg/L
delta-BHC	Chlorinated Pesticides	0.005	µg/L
gamma-BHC (lindane)	Chlorinated Pesticides	0.02	µg/L
alpha-chlordane	Chlorinated Pesticides	0.1	µg/L
gamma-chlordane	Chlorinated Pesticides	0.1	µg/L
4,4'-DDD	Chlorinated Pesticides	0.05	µg/L
4,4'-DDE	Chlorinated Pesticides	0.05	µg/L
4,4'-DDT	Chlorinated Pesticides	0.01	µg/L
Dieldrin	Chlorinated Pesticides	0.01	µg/L
alpha-Endosulfan	Chlorinated Pesticides	0.02	µg/L
beta-Endosulfan	Chlorinated Pesticides	0.01	µg/L
Endosulfan sulfate	Chlorinated Pesticides	0.05	µg/L
Endrin	Chlorinated Pesticides	0.01	µg/L
Endrin aldehyde	Chlorinated Pesticides	0.01	µg/L
Heptachlor	Chlorinated Pesticides	0.01	µg/L
Heptachlor Epoxide	Chlorinated Pesticides	0.01	µg/L
Toxaphene	Chlorinated Pesticides	0.5	µg/L
Aroclor-1016	PolyChlorinated Biphenyls	0.5	µg/L
Aroclor-1221	PolyChlorinated Biphenyls	0.5	µg/L
Aroclor-1232	PolyChlorinated Biphenyls	0.5	µg/L
Aroclor-1242	PolyChlorinated Biphenyls	0.5	µg/L
Aroclor-1248	PolyChlorinated Biphenyls	0.5	µg/L
Aroclor-1254	PolyChlorinated Biphenyls	0.5	µg/L
Aroclor-1260	PolyChlorinated Biphenyls	0.5	µg/L
Atrazine	Organophosphate Pesticides	2	µg/L
Chlorpyrifos	Organophosphate Pesticides	0.05	µg/L
Cyanazine	Organophosphate Pesticides	2	µg/L
Diazinon	Organophosphate Pesticides	0.01	µg/L
Malathion	Organophosphate Pesticides	1	µg/L
Prometryn	Organophosphate Pesticides	2	µg/L
Simazine	Organophosphate Pesticides	2	µg/L
2,4-D	Herbicides	10	µg/L
Glyphosate	Herbicides	5	µg/L
2,4,5-TP-SILVEX	Herbicides	0.5	µg/L

The list of analytes was streamlined by incorporating analytes as allowed by the MS4 Permit and removing pollutants with associated MLs that have been monitored within the Malibu Creek Watershed but have not been historically detected.

Appendix J – Storm Drain Channel and Outfall Map

(From Section 7 in Attachment E of the MS4 Permit)

The following maps provide the information to comply with Section VII – Outfall Based Monitoring of Attachment E of the MS4 Permit.

Figure J-1: CIMP Overall Map

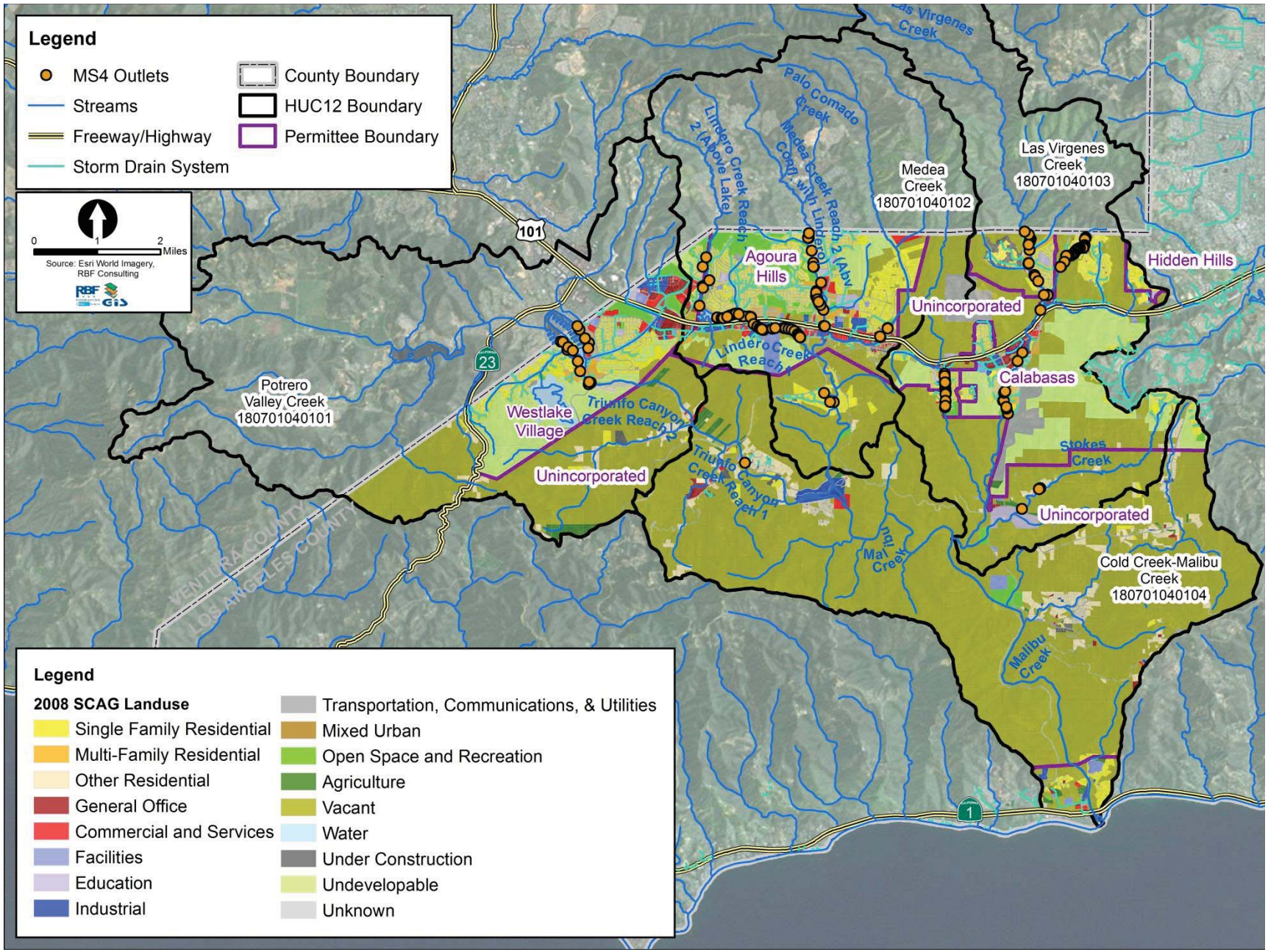


Figure J-2: Cold Creek

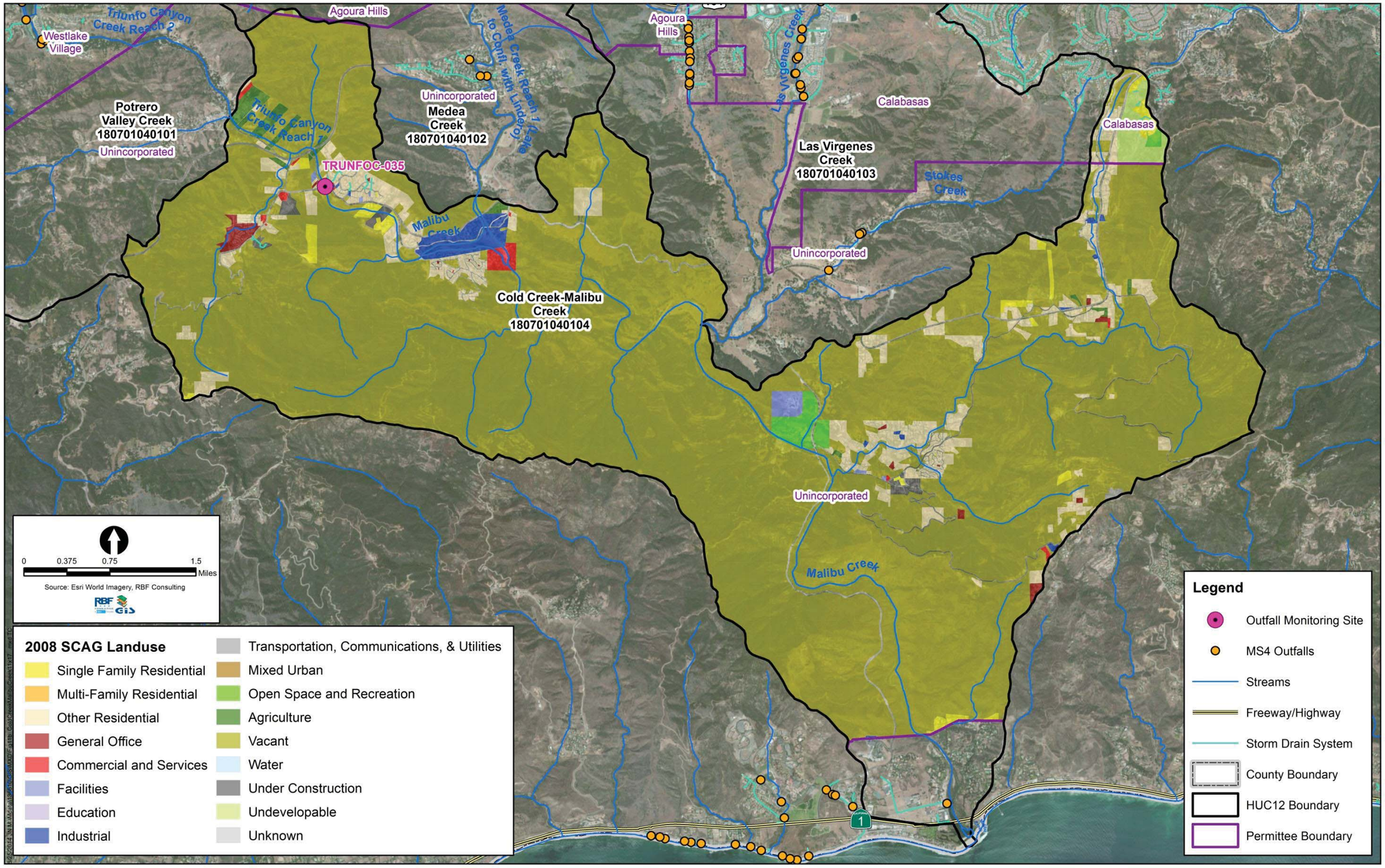


Figure J-3: Las Virgenes

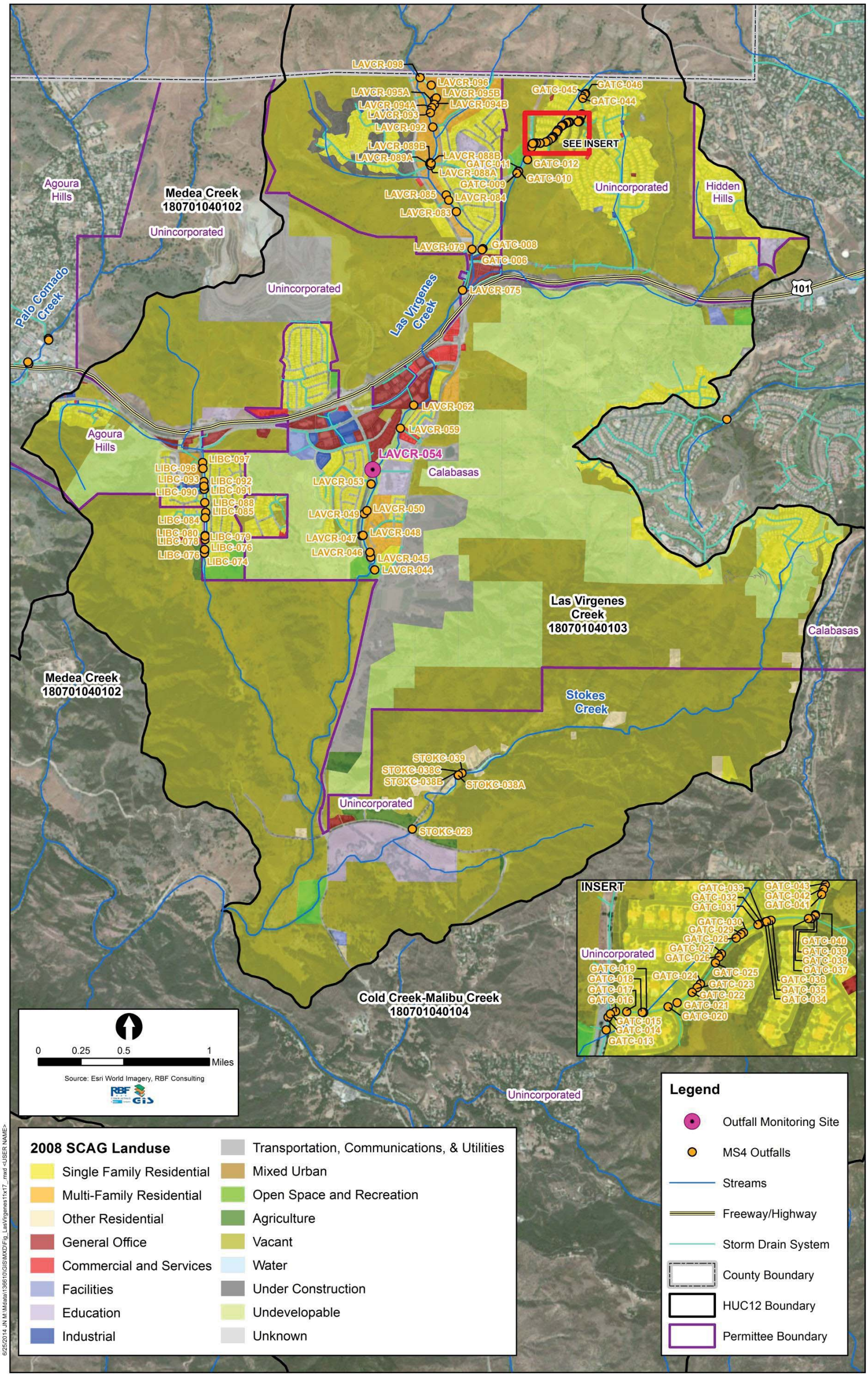


Figure J-4: Madea Creek

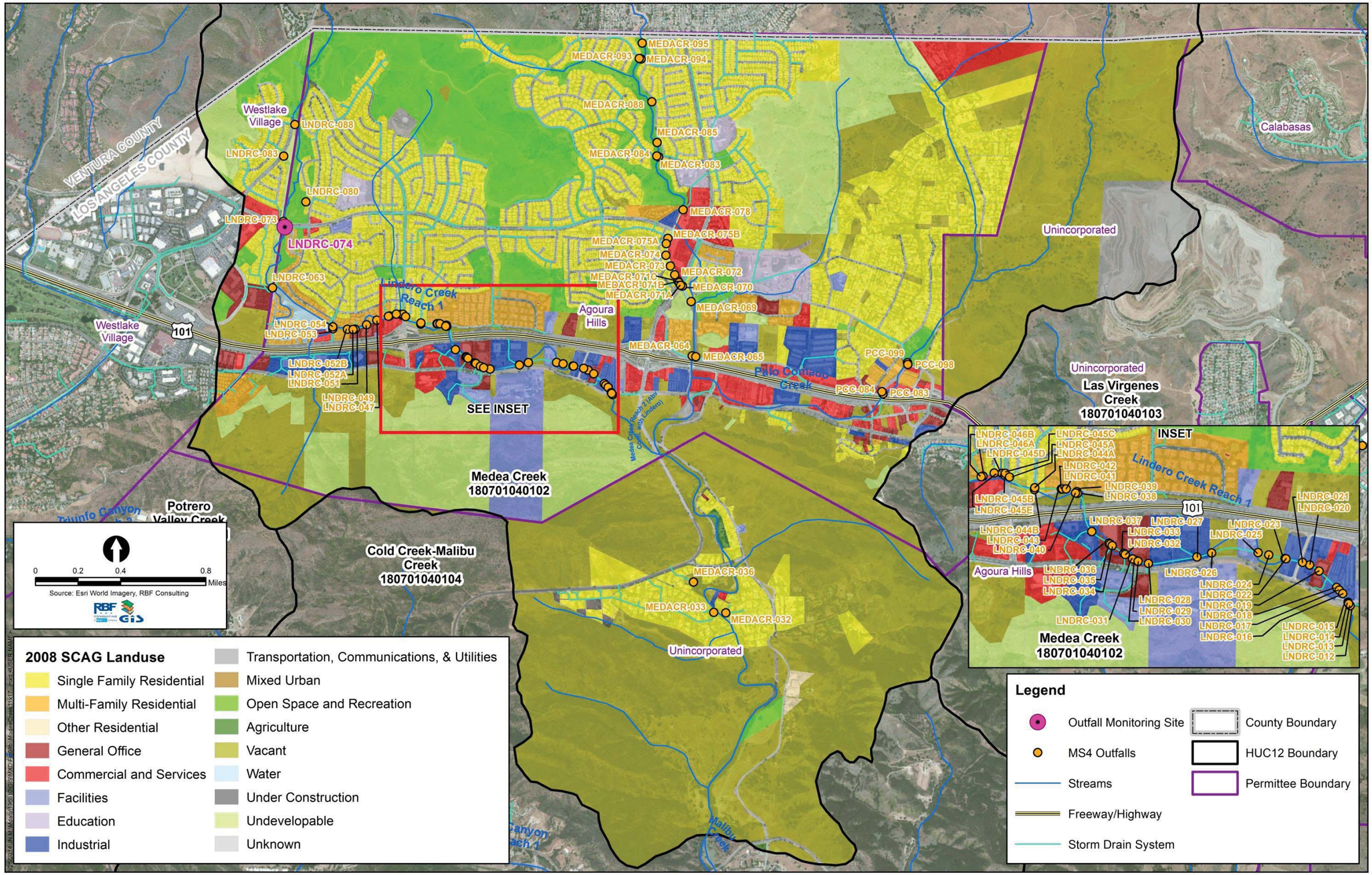
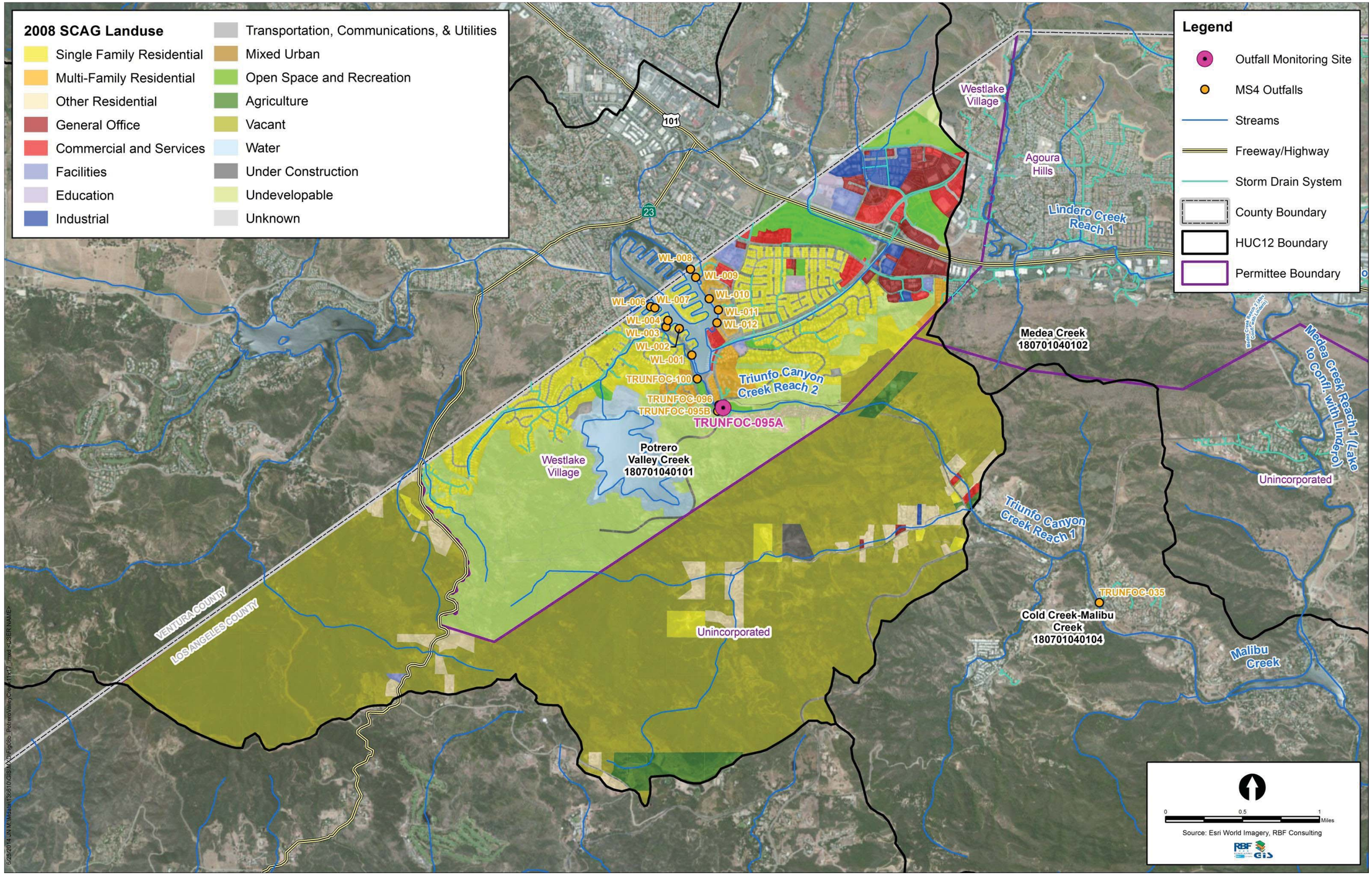


Figure J-5: Potrero Valley Creek



Appendix K – Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan

MALIBU CREEK AND LAGOON BACTERIA TMDL
COMPLIANCE MONITORING PLAN

PREPARED BY THE
COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

SUBMITTED ON BEHALF OF

COUNTY OF LOS ANGELES
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

COUNTY OF VENTURA
VENTURA COUNTY WATERSHED PROTECTION DISTRICT

CALIFORNIA DEPARTMENT OF TRANSPORTATION

CITIES OF
AGOURA HILLS
CALABASAS
HIDDEN HILLS
MALIBU
THOUSAND OAKS
WESTLAKE VILLAGE

ORIGINAL SUBMITTAL DATE:	**MAY 24, 2006**
REGIONAL WATER QUALITY CONTROL BOARD, LA REGION APPROVAL DATE:	**SEPTEMBER 11, 2007**
REVISION DATE:	**FEBRUARY 25, 2008**

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APPENDIX A – Malibu Creek and Lagoon Bacteria Total Maximum Daily Load
APPENDIX B – Sampling Locations
APPENDIX C – Ventura County Committal Letter

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1.0 INTRODUCTION

1.1 Background

The Malibu Creek Watershed is located about 35 miles west of Los Angeles and extends from the Santa Monica Mountains to the Pacific Coast. The watershed is approximately 109 square miles and drains into the Malibu Lagoon and ultimately into Santa Monica Bay when the Lagoon is breached.

Federal Regulations under the Clean Water Act require States to develop a list of impaired waters and the pollutants for which they are impaired, also known as the 303(d) List. Several reaches and tributaries to the Malibu Creek and Lagoon were designated as impaired and included on California's 1998 and 2002 CWA 303(d) list of impaired waters due to excessive amounts of coliform bacteria. The presence of coliform bacteria in surface waters is an indicator that water quality may not be sufficient to maintain the beneficial use of these waters for human body contact recreation (REC-1). To address this issue, States must establish a watershed-based pollutant specific Total Maximum Daily Load to bring impaired waters into compliance with water quality standards necessary for its beneficial uses.

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board) adopted a first draft of the Malibu Creek and Lagoon Bacteria TMDL on December 13, 2004. The TMDL was subsequently approved by the United States Environmental Protection Agency (USEPA) on January 10, 2006, and came into effect on January 24, 2006. One of the TMDL's first requirements is the submittal of a Compliance Monitoring Plan within 120 days of the effective date.

1.2 Participants

This Monitoring Plan is developed by the County of Los Angeles Department of Public Works in coordination with the other responsible jurisdictions and agencies under the TMDL, including the County of Ventura, the cities of Agoura Hills, Calabasas, Hidden Hills, Malibu, Thousand Oaks, and Westlake Village; and California Department of Transportation (Caltrans). Implementation of this monitoring program will be accomplished through a joint coordinated effort by these responsible agencies.

During the development of the monitoring plan, feedback was also solicited from the Regional Board, Heal the Bay, and Santa Monica Bay Keeper.

For reference, the TMDL document can be found in Appendix A of this document or on the Regional Board's website at http://www.swrcb.ca.gov/rwqcb4/ .

1.3 Objectives

Data collected from this Monitoring Plan will be used to achieve the following:

1) Characterize the existing water quality as compared to water quality at the reference watershed,
2) Measure compliance with the allowable number of exceedances days set forth by the TMDL; and
3) Provide data to support the re-evaluations that will be made when the TMDL is reconsidered in 2009.

2.0 COMPLIANCE TARGETS

2.1 Numeric Targets

The TMDL establishes multi-part numeric targets based on the bacteriological water quality objectives for marine and fresh water to protect the water contact recreation use (REC-1). The bacteriological objectives are set forth in Chapter 3 of the Regional Water Quality Control Plan (Basin Plan). The objectives are based on four bacteriological indicators and include both the geometric mean[1] limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL for marine waters and fresh waters are listed below in Table 1 and Table 2, respectively:

Table 1. Numeric Targets in Marine Waters Designated for Water Contact Recreation (REC-1).

Geometric Mean Limits (Marine Waters)	
Indicator	**mpn/100ml**
Total Coliform	1,000
Fecal Coliform	200
Enterococcus	35
Single Sample Limits (Marine Waters)	
Indicator	**mpn/100ml**
Total Coliform*	10,000
Fecal Coliform	400
Enterococcus	104

*Total coliform density shall not exceed 1,000/100 ml, if the ratio of fecal-to-total coliform exceeds 0.1.

Table 2. Numeric Targets in Fresh Waters Designated for Water Contact Recreation (REC-1).

Geometric Mean Limits (Fresh Waters)	
Indicator	**mpn/100ml**
E. Coli	126
Fecal Coliform	200
Single Sample Limits (Fresh Waters)	
Indicator	**mpn/100ml**
E. Coli	235
Fecal Coliform	400

[1] The geometric mean is defined in Webster's Dictionary as "the n^{th} root of the product of n numbers." Thus, the 30-day geometric mean calculation for the Malibu Creek and Lagoon TMDL will be calculated as the 30th root of the product of 30 numbers (the most recent 30 day results). For weekly sampling, the 30 numbers are obtained by assigning the weekly test result to the remaining days of the week. If more samples are tested within the same week, each test result will supersede the previous result and be assigned to the remaining days of the week until the next sample is collected. This rolling 30-day geometric mean must be calculated for each day, regardless of whether a weekly or daily schedule is selected.

2.2 Allowable Number of Exceedance Days

The TMDL allows some exceedances of the Basin Plan bacteriological objectives to account for bacterial loading from non-anthropogenic sources (e.g. wildlife). The allowable number of exceedance days varies depending on the time of year[2] and sampling frequency. Table 3 summarizes the allowable number of exceedance days for all sampling sites, as well as when these limits must be achieved.

Table 3. Summary of Compliance Targets

Time of Year	Compliance Deadline	Allowable Number of Exceedance Days			
		Daily Sampling		Weekly Sampling	
		Single Sample Limit	Geometric Mean Limit	Single Sample Limit	Geometric Mean Limit
Summer dry weather	1/24/09*	0	0	0	0
Winter dry weather	1/24/12	3	0	1	0
Wet weather	1/24/16**	17	0	3	0

*May be extended to 1/24/12.
**May be extended up to 7/15/21.

[2] For compliance purposes, the TMDL divides the year into three separate periods:

- summer dry-weather (April 1 –October 31)
- winter dry-weather (November 1 – March 31), and
- wet weather (days with rain events of $\geq$ 0.1 inches of precipitation and the three days following the end of the rain event.

3.0 SAMPLING PROGRAM DESIGN

3.1 Sampling Sites

In total, eighteen sampling sites will be sampled under this monitoring program. Sites were selected using the following guidelines:

- Seven sites specified in Table 7-10.2 of the TMDL (Noted in Table 4).
- At least one site in each subwatershed;
- Areas where frequent REC-1 use is known to occur; and
- Availability of previous water quality data;
- Perennial flow; and
- Safe and legal access.

The Ventura County Watershed Protection District, on behalf of Ventura County and the City of Thousand Oaks have committed to providing monitoring services on seven sampling stations within their jurisdiction. Los Angeles County, Caltrans, and the Cities of Agoura Hills, Calabasas, Hidden Hills, Malibu, and Westlake Village will collaborate in providing the monitoring data for eleven sampling stations.

Many of the sites either are or had been previously monitored by other programs. Specifically, one of the proposed sites is also being monitored by Heal the Bay. Four sites are being monitored by the Las Virgenes Municipal Water District. Four sites had been previously monitored under the Malibu Creek Watershed Monitoring Program led by the City of Calabasas and two sites monitored under the Malibu Creek Watershed Water Quality Monitoring Project conducted by the County of Los Angeles Department of Public Works. Table 4 lists all 18 sampling sites and the subwatershed in which each is located. The general locations of the sampling sites are shown in Figure 1. A more detailed description of each sampling sites is included in Appendix B.

3.2 Frequency

The TMDL allows a choice between daily and weekly sampling for this monitoring program. Responsible agencies have elected to conduct weekly sampling at all sites. Because fewer exceedances will be detected with weekly sampling, the TMDL's allowable number of exceedance days is reduced accordingly when samples are collected weekly.

3.3 Duration

The monitoring program will be implemented as approved until the TMDL is re-considered in 2009/2010. At that time, the program will be re-evaluated so monitoring can be reduced or discontinued at those reaches where beneficial uses are not impaired. It is assumed that such modifications to the approved monitoring program will require Regional Board approval.

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FIGURE 1. MALIBU CREEK AND LAGOON BACTERIAL TMDL COMPLIANCE MONITORING PLAN

GENERAL LOCATION OF SAMPLING SITES

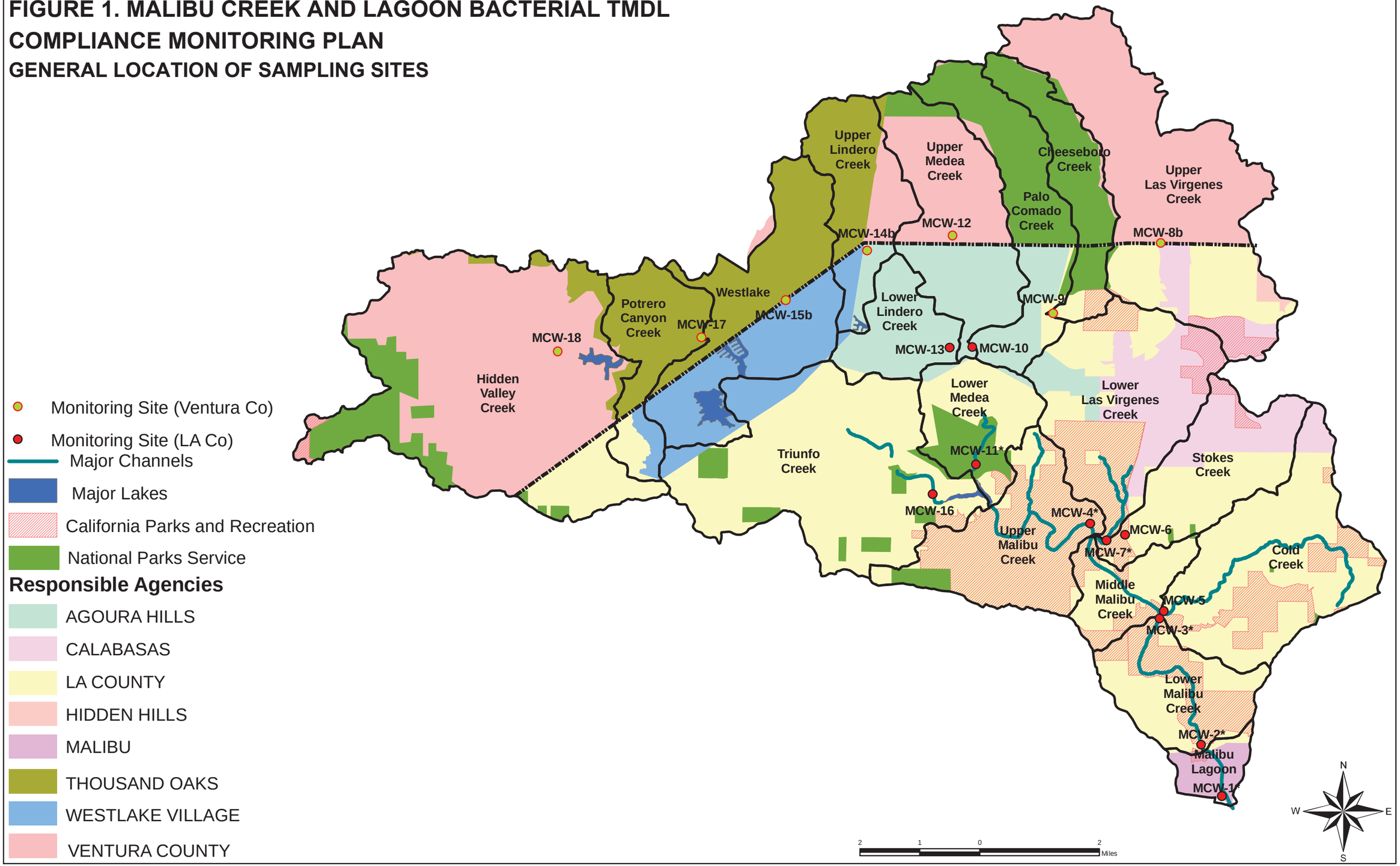

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TABLE 4
LIST OF SAMPLING SITES

Responsible Agencies	SITE ID	Subwatershed	Coordinates
Los Angeles County, Cities (Agoura Hills**, Calabasas, Hidden Hills, Malibu, Westlake Village), and Caltrans	**MCW-1***	Malibu Lagoon	N 34°02.069' W 118°40.969'
	MCW-2*	Lower Malibu Creek	N 34°02.825' W 118°41.371'
	MCW-3*	Middle Malibu Creek	N 34°04.654' W 118°42.105'
	MCW-4*	Upper Malibu Creek	N 34°06.001' W 118°43.364'
	MCW-5	Cold Creek	N 34°04.739' W 118°41.996'
	MCW-6	Stokes Creek	N 34°05.889' W 118°42.748'
	MCW-7*	Lower Las Virgenes	N 34°05.769' W 118°43.072'
	MCW-10	Palo Comado Creek	N 34°08.585' W 118°45.468'
	MCW-11*	Lower Medea	N 34°06.921' W 118°45.339'
	MCW-13	Lower Lindero	N 34°08.592' W 118°45.842'
	MCW-16*	Triunfo	N 34°06.438' W 118°46.073'
Ventura County** and the City of Thousand Oaks	**MCW-8b**	Upper Las Virgenes	N 34°10.115' W 118°42.102'
	MCW-9	Cheeseboro Creek	N 34°09.082' W 118°44.058'
	MCW-12	Upper Medea	N 34°10.230' W 118°45.765'
	MCW-14b	Upper Lindero	N 34°09.943' W 118°47.268'
	MCW-15b	Westlake	N 34°09.263' W 118°48.693'
	MCW-17	Potrero Canyon	N 34°08.696' W 118°50.165'
	MCW-18	Hidden Valley	N 34°08.474' W 118°52.673'

Notes:

* Sampling Stations pursuant LA Regional Board Resolution 2004-19R, Malibu Creek and Lagoon Bacterial TMDL Table 7-10.2.

** Agency responsible for contracting or providing services.

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4.0 METHODOLOGY

Monitoring will begin upon execution of the cost-sharing Memorandum of Agreement between the County of Los Angeles and the other participating responsible agencies, with a goal of no later than six months after the Regional Board's approval of this plan. It is estimated that six months will be needed to hire a consultant team to implement this program.

4.1 Sampling Procedure

Sampling will be conducted by qualified professionals with proper training and in accordance with accepted industry protocols. Responsible agencies intend to contract this program's implementation to outside consultant(s). General sampling procedures are described below. Prior to the start of sampling, a detailed sampling protocol and QA/QC procedures will be submitted to the Regional Board.

Weekly sampling will be conducted on Tuesdays. Grab samples will be collected, placed on ice, and delivered to the lab under chain-of-custody within the six-hour holding time. Each sample will be associated with recorded observations of site conditions, which should minimally include sample ID, collection date and time, weather conditions including rain measurement, estimated flow rate, environmental conditions (presence of wildlife), suspicious discharges, sample characteristics (color and turbidity), and sampler's name.

Sampling should only occur when conditions are safe. The safety of the sample collector is the top priority and should preclude scheduled sampling.

4.2 Analytical Methodology

Marine/brackish samples collected from the Lagoon will be tested for the presence of total coliform, E. coli or fecal coliform, and enterococcus bacteria. Freshwater samples will be tested for the presence of E. coli and fecal coliform. All indicator groups will be quantified from a single sample collected at the designated monitoring site. Necessary dilutions or aliquot volumes will be processed to insure that reportable values can be determined. Bacterial results are reported as organism type per 100 mL of sample. When selecting analytical bacterial methods for TMDL monitoring, the importance of practical fast turnaround times from the laboratory (48 hours for preliminary results for fecal coliform) should be emphasized.

For the marine/brackish samples, the IDEXX chromogenic substrate method E. coli result can be converted to fecal coliform using a 1:1 translator. The application of a 1:1 translator was approved by the Regional Board in October 2002 after review of the IDEXX and Membrane Filtration Study conducted by the City of Los Angeles (approval letter dated October 16, 2002, from Dennis Dickerson, Executive Officer).

Prior to the start of sampling, a detailed laboratory protocol and QA/QC procedures will be submitted to the Regional Board for review.

4.3 Data Management

Data collected as result of this monitoring program will be managed entirely by the consultant team conducting the monitoring. Both quantitative and qualitative results will be stored in a database designed in accordance with the State's Surface Water Ambient Monitoring Program data reporting protocols. Data reports will summarize sampling results as well as contain a running tally of the number of exceedances. Monthly data summary reports will be submitted to the Regional Board as well as participating responsible agencies by the last day of each month for data collected during the previous month.

To determine whether a result falls under the dry- or wet-weather category, a rain gage within the Malibu Creek Watershed will be used. The LA County Department of Public Works' ALERT Rainfall Gage 317 (Agoura), will be used as the reference rain gage. Data from this rainfall gage is available via the LA County Department of Public Works' Internet Site: http://dpw.lacounty.gov/wrd/Precip/index.cfm

STATION NAME	ALERT ID	RAINGAGE REF ID	LAT	LONG	ELEV.
Agoura Precip	317	434	34-08-08	118-45-07	800.00

4.4 Quality Assurance/Quality Control

If multiple laboratories are used, each will participate in an inter-laboratory calibration program to ensure consistency of results. Laboratories must employ a program that associates quality assurance with the laboratory facility, staff, instrumentation and equipment, materials and methods, media and reagents, and data validation. The quality assurance procedures shall be in accordance with Standard Methods for the Examination of Water and Wastewater, 20-21st Editions (APHA 1999-05). All participating laboratories must maintain ELAP certification.

APPENDIX A

Attachment A to Resolution No. 2004-019R

Proposed Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate the Malibu Creek and Lagoon Bacteria TMDL

Adopted by the California Regional Water Quality Control Board, Los Angeles Region on December 13, 2004

Amendments:

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Chapter 7. Total Maximum Daily Loads (TMDLs) Summaries, Section 7-10 (Malibu Creek and Lagoon Bacteria TMDL)

This TMDL was adopted by the Regional Water Quality Control Board on December 13, 2004.

This TMDL was approved by:

The State Water Resources Control Board on September 22, 2005.
The Office of Administrative Law on December 1, 2005.
The U.S. Environmental Protection Agency on January 10, 2006.

The following table includes the elements of this TMDL.

Table 7-10.1. Malibu Creek and Lagoon Basins Bacteria TMDL: Elements

Element	Key Findings and Regulatory Provisions
Problem Statement	Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use at Malibu Creek, Lagoon, and adjacent beach. Swimming in waters with elevated bacterial indicator densities has long been associated with adverse health effects. Specifically, local and national epidemiological studies compel the conclusion that there is a causal relationship between adverse health effects and recreational water quality, as measured by bacterial indicator densities.
Numeric Target *(Interpretation of the numeric water quality objective, used to calculate the waste load allocations)*	The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine and fresh water to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters. These bacteriological objectives are set forth in Chapter 3 of the Basin Plan.[1] The objectives are based on four bacterial indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are: In Marine Waters Designated for Water Contact Recreation (REC-1) <u>1. Geometric Mean Limits</u> a. Total coliform density shall not exceed 1,000/100 ml. b. Fecal coliform density shall not exceed 200/100 ml. c. Enterococcus density shall not exceed 35/100 ml. <u>2. Single Sample Limits</u> a. Total coliform density shall not exceed 10,000/100 ml. b. Fecal coliform density shall not exceed 400/100 ml. c. Enterococcus density shall not exceed 104/100 ml. d. Total coliform density shall not exceed 1,000/100 ml, if the ratio of fecal-to-total coliform exceeds 0.1. In Fresh Waters Designated for Water Contact Recreation (REC-1) 1. Geometric Mean Limits a. E. coli density shall not exceed 126/100 ml. b. Fecal coliform density shall not exceed 200/100 ml. 2. Single Sample Limits a. E. coli density shall not exceed 235/100 ml. b. Fecal coliform density shall not exceed 400/100 ml.

[1] The bacteriological objectives were revised by a Basin Plan amendment adopted by the Regional Board on October 25, 2001, and subsequently approved by the State Water Resources Control Board, the Office of Administrative Law and finally by U.S. EPA on September 25, 2002.

Element	Key Findings and Regulatory Provisions
	These objectives are generally based on an acceptable health risk for marine recreational waters of 19 illnesses per 1,000 exposed individuals as set by the US EPA (US EPA, 1986). The targets apply throughout the year. The final compliance point for the targets is the point at which the effluent from a discharge initially mixes with the receiving water. Implementation of the above bacteria objectives and the associated TMDL numeric targets is achieved using a 'reference system/anti-degradation approach' rather than the alternative 'natural sources exclusion approach' or strict application of the single sample objectives. As required by the CWA and Porter-Cologne Water Quality Control Act, Basin Plans include beneficial uses of waters, water quality objectives to protect those uses, an anti-degradation policy, collectively referred to as water quality standards, and other plans and policies necessary to implement water quality standards. The 'reference system/anti-degradation approach' means that on the basis of historical exceedance levels at existing monitoring locations, including a local reference beach within Santa Monica Bay, a certain number of daily exceedances of the single sample bacteria objectives are permitted. The allowable number of exceedance days is set such that (1) bacteriological water quality at any site is at least as good as at a designated reference site within the watershed and (2) there is no degradation of existing bacteriological water quality. This approach recognizes that there are natural sources of bacteria that may cause or contribute to exceedances of the single sample objectives and that it is not the intent of the Regional Board to require treatment or diversion of natural coastal creeks or to require treatment of natural sources of bacteria from undeveloped areas. The geometric mean targets may not be exceeded at any time. The rolling 30-day geometric means will be calculated on each day. If weekly sampling is conducted, the weekly sample result will be assigned to the remaining days of the week in order to calculate the daily rolling 30-day geometric mean. For the single sample targets, each existing monitoring site is assigned an allowable number of exceedance days for three time periods (1) summer dry-weather (April 1 to October 31), (2) winter dry-weather (November 1 to March 31), and (3) wet-weather (defined as days with 0.1 inch of rain or greater and the three days following the rain event.)
Source Analysis	Fecal coliform bacteria may be introduced from a variety of sources including storm water runoff, dry-weather runoff, onsite wastewater treatment systems, and animal wastes. An inventory of possible point and nonpoint sources of fecal coliform bacteria to the waterbody was compiled, and both simple methods and computer modeling were used to estimate bacteria loads for those sources. Source inventories were

Element	Key Findings and Regulatory Provisions
	used in the analysis to identify all potential sources within the Malibu Creek watershed, modeling was used to identify the potential delivery of pathogens into the creeks and the lagoon
Loading Capacity	The loading capacity is defined in terms of bacterial indicator densities, which is the most appropriate for addressing public health risk, and is equivalent to the numeric targets, listed above. As the numeric targets must be met at the point where the effluent from storm drains or other discharge initially mixes with the receiving water throughout the day, no degradation or dilution allowance is provided.
Waste Load Allocations *(for point sources)*	Waste Load Allocations (WLAs) are expressed as the number of daily or weekly sample days that may exceed the single sample limits or 30-day geometric mean limits as identified under "Numeric Target." WLAs are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection. Zero days of exceedance are allowed for the 30-day geometric mean limits. The allowable days of exceedance for the single sample limits differ depending on season, dry weather or wet-weather, and by sampling locations as described in Table 7-10.2. The allowable number of exceedance days for a monitoring site for each time period is based on the lesser of two criteria (1) exceedance days in the designated reference system and (2) exceedance days based on historical bacteriological data at the monitoring site. This ensures that bacteriological water quality is at least as good as that of a largely undeveloped system and that there is no degradation of existing water quality. However, existing data indicates that the number of exceedance days for all locations assessed in this TMDL were greater than the allowable exceedance days (i.e., number of exceedance days greater than the number at the reference sites). For each monitoring site, allowable exceedance days are set on an annual basis as well as for three time periods. These three periods are: 1. summer dry-weather (April 1 to October 31) 2. winter dry-weather (November 1 to March 31) 3. wet-weather (defined as days of 0.1 inch of rain or more plus three days following the rain event). The responsible jurisdictions and responsible agencies are the County of Los Angeles, County of Ventura, the cities of Malibu, Calabasas, Agoura Hills, Hidden Hills, Simi Valley, Westlake Village, and Thousand Oaks; Caltrans, and the California Department of Parks and Recreation.The responsible jurisdictions and responsible agencies include the permittees and co-permittees of the municipal storm water (MS4) permits for Los Angeles County and Ventura County, and Caltrans. The storm water permittees are individually responsible for the discharges from their municipal separate storm sewer systems to Malibu Creek, Malibu Lagoon or tributaries thereto. The California

Element	Key Findings and Regulatory Provisions
	Department of Parks and Recreation (State Parks), as the owner of the Malibu Lagoon and Malibu Creek State Park, is the responsible agency for these properties. However, since the reference watershed approach used in developing this TMDL is intended to make allowances for natural sources, State Parks is only responsible for: conducting a study of bacteria loadings from birds in the Malibu Lagoon, water quality monitoring, and compliance with load allocations applicable to anthropogenic sources on State Park property (e.g., onsite wastewater treatment systems). The Santa Monica Mountains Conservancy and the National Park Service as the owner of natural parkland also are responsible for water quality monitoring and compliance with load allocations resulting from anthropogenic sources (e.g.,onsite wastewater treatment systems) from lands under their jurisdiction. As discussed in "Source Analysis", discharges from Tapia WWRF and effluent irrigation, and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean.
Load Allocations *(for nonpoint sources)*	Load Allocations (LA) are expressed as the number of daily or weekly sample days that may exceed the single sample limits or 30-day geometric mean limits as identified under "Numeric Target." LAs are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection. Zero days of exceedance are allowed for the 30-day geometric mean limits. The allowable days of exceedance for the single sample limits differ depending on season, dry weather or wet-weather, and by sampling locations as described in Table 7-10.2. The allowable number of exceedance days for a monitoring site for each time period is based on the lesser of two criteria (1) exceedance days in the designated reference system and (2) exceedance days based on historical bacteriological data at the monitoring site. This ensures that bacteriological water quality is at least as good as that of a largely undeveloped system and that there is no degradation of existing water quality. However, existing data indicates that the number of exceedance days for all locations assessed in this TMDL were greater than the allowable exceedance days. For each monitoring site, allowable exceedance days are set on an annual basis as well as for three time periods. These three periods are: 1. summer dry-weather (April 1 to October 31) 2. winter dry-weather (November 1 to March 31) 3. wet-weather (defined as days of 0.1 inch of rain or more plus three days following the rain event).

Element	Key Findings and Regulatory Provisions
	Onsite wastewater treatment systems were identified as the major nonpoint anthropogenic source within the watershed. The responsible agencies are the county and city health departments and/or other local agencies that oversee installation and operation of on-site wastewater treatment systems. However, owners of on-site wastewater treatment systems are responsible for actual discharges.
Implementation	The regulatory mechanisms to implement the TMDL may include, but are not limited to the Los Angeles County Municipal Storm Water NPDES Permit (MS4), Ventura County Municipal Storm Water NPDES Permit, the Caltrans Storm Water Permit, waste discharge requirements (WDRs), MOUs, revised MOUs, general NPDES permits, general industrial storm water permits, general construction storm water permits, and the authority contained in Sections 13225, 13263 and 13267 of the Water Code. Each NPDES permit assigned a WLA shall be reopened or amended at reissuance, in accordance with applicable laws, to incorporate the applicable WLAs as a permit requirement. This TMDL will be implemented in three phases over a ten-year period as outlined in Table 7-10.3. Within three years of the effective date of the TMDL, compliance with the allowable number of summer dry-weather exceedance days and the rolling 30-day geometric mean targets must be achieved. In response to a written request from the responsible jurisdiction or responsible agency subject to conditions described in Table 7-10.3, the Executive Officer of the Regional Board may extend the compliance date for the summer dry-weather allocations from 3 to up to six years from the effective date of this TMDL Within six years of the effective date of the TMDL, compliance with the allowable number of winter dry-weather exceedance days and the rolling 30-day geometric mean targets must be achieved.Within ten years of the effective date of the TMDL, compliance with the allowable number of wet-weather exceedance days and rolling 30-day geometric mean targets must be achieved. To be consistent with the Santa Monica Bay (SMB) Beaches TMDLs, the Regional Board intends to reconsider this TMDL in coordination with the reconsideration of the SMB Beaches TMDLs. The SMB Beaches TMDLs are scheduled to be reviewed in July 2007 (four years from the effective date of the SMB Beaches TMDLs). The review will include a possible revision to the allowable winter dry-weather and wet-weather exceedance days based on additional data on bacterial indicator densities in the wave wash; to re-evaluate the reference system selected to set allowable exceedance levels; and to re-evaluate the reference year used in the calculation of allowable exceedance days. In addition, the method for applying the 30-day geometric mean limit also will be reviewed. The Malibu Creek Bacteria TMDL is scheduled to be reconsidered in three years from the effective date, which is expected to approximately coincide with the reassessment required under the SMB Beaches TMDLs.

Element	Key Findings and Regulatory Provisions
Margin of Safety	A margin of safety has been implicitly included through the following conservative assumptions. • The watershed loadings were based on the 90th percentile year for rain (1993) based on the number of wet weather days. This should provide conservatively high runoff from different land uses for sources of storm water loads • The watershed loadings were also based on a very dry rain year (1994). This ensures compliance with the numeric target during low flows when septic systems and dry urban runoff loads are the major bacterial sources. • The TMDL was based on meeting the fecal 30-day geometric mean target of 200 MPN/ 100 ml, which for these watersheds was estimated to be more stringent level than the allowable exceedance of the single sample standard. This approach also provides assurance that the E. coli single sample standard will not be exceed. • The load reductions established in this TMDL were based on reduction required during the two different critical year conditions. A wet year when storm loads are high, and a more typical dry year when base flows and assimilative capacity is low. This adds a margin of safety for more typical years. In addition, an explicit margin of safety has been incorporated, as the load allocations will allow exceedances of the single sample targets no more than 5% of the time on an annual basis, based on the cumulative allocations proposed for dry and wet weather. Currently, the Regional Board concludes that there is water quality impairment if more than 10% of samples at a site exceed the single sample bacteria objectives annually.
Seasonal Variations and Critical Conditions	Seasonal variations are addressed by developing separate waste load allocations for three time periods (summer dry-weather, winter-dry weather, and wet-weather) based on public health concerns and observed natural background levels of exceedance of bacterial indicators. To establish the critical condition for the wet days, we used rain data from 1993. Based on data from the Regional Board's Santa Monica Bay TMDL this represents the 90th percentile rain year based on rain data from 1947 to 2000. To further evaluate the critical conditions, we modeled a representative dry year. The dry-year critical condition was based on 1994, which was the 50th percentile year in terms of dry weather days for the period of 1947-2000.
Compliance Monitoring	Responsible jurisdictions and agencies shall submit a compliance monitoring plan to the Executive Officer of the Regional Board for approval. The compliance monitoring plan shall specify sampling frequency (daily or weekly) and sampling locations and that will serve

Element	Key Findings and Regulatory Provisions
	as compliance points. This compliance monitoring program is to determine the effectiveness of the TMDL and not to determine compliance with individual load or wasteload allocations for purposes of enforcement. If the number of exceedance days is greater than the allowable number of exceedance days the water body segment shall be considered out-of-compliance with the TMDL. Responsible jurisdictions or agencies shall not be required to initiate an investigation detailed in the next paragraph if a demonstration is made that bacterial sources originating within the jurisdiction of the responsible agency have not caused or contributed to the exceedance. If a single sample shows the discharge or contributing area to be out of compliance, the Regional Board may require, through permit requirements or the authority contained in Water Code section 13267, daily sampling at the downstream location (if it is not already) until all single sample events meet bacteria water quality objectives. Furthermore, if a creek location is out of compliance as determined in the previous paragraph, the Regional Board shall require responsible agencies to initiate an investigation, which at a minimum shall include daily sampling in the target receiving waterbody reach or at the existing monitoring location until all single sample events meet bacteria water quality objectives. The County of Los Angeles, County of Ventura, and municipalities within the Malibu Creek watershed, Caltrans, and the California Department of Parks and Recreation are strongly encouraged to pool efforts and coordinate with other appropriate monitoring agencies in order to meet the challenges posed by this TMDL by developing cooperative compliance monitoring programs.

Note: The complete staff report for the TMDL is available for review upon request.

Table 7-10.2. Malibu Creek and Lagoon Bacteria TMDL: Final Annual Allowable Exceedance Days for Single Sample Limits by Sampling Location

Compliance Deadline		3* years after effective date		6 years after effective date		10 years after effective date	
		Summer Dry Weather ^		Winter Dry Weather ^**		Wet Weather ^**	
		April 1 – October 31		November 1 - March 31		November 1 - October 31	
Station ID	Location Name	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)
LA RWQCB	Triunfo Creek	0	0	3	1	17	3
LA RWQCB	Lower Las Virgenes Creek	0	0	3	1	17	3
LA RWQCB	Lower Medea Creek	0	0	3	1	17	3
LVMWD (R-9)	Upper Malibu Creek, above Las Virgenes Creek	0	0	3	1	17	3
LVMWD (R-2)	Middle Malibu Creek, below Tapia discharge 001	0	0	3	1	17	3
LVMWD (R-3)	Lower Malibu Creek, 3 mi below Tapia	0	0	3	1	17	3
LVMWD (R-4)	Malibu Lagoon, above PCH	0	0	3	1	17	3
LVMWD (R-11)	Malibu Lagoon, below PCH	0	0	3	1	17	3
------	Other sampling stations as identified in the Compliance Monitoring Plan as approved by the Executive Officer including at least one sampling station in each subwatershed, and areas where frequent REC-1 use is known to occur.	0	0	3	1	17	3

Notes: The number of allowable exceedances is based on the lesser of (1) the reference system or (2) existing levels of exceedance based on historical monitoring data.
The allowable number of exceedance days during winter dry-weather is calculated based on the 10th percentile storm year in terms of dry days at the LAX meteorological station
The allowable number of exceedance days during wet-weather is calculated based on the 90th percentile storm year in terms of wet days at the LAX meteorological station.
^ A dry day is defined as a non-wet day. A wet day is defined as a day with a 0.1-inch or more of rain and the three days following the rain event.
* The compliance date may be extended by the Executive Officer to up to 6 years from the effective date.
* *A revision of the TMDL is scheduled for four years after the effective date of the Santa Monica Bay Beaches TMDLs in order to re-evaluate the allowable exceedance days during winter dry-weather and wet-weather based on additional monitoring data and the results of the study of relative loading from storm drains versus birds.

Table 7-10.3. Malibu Creek and Lagoon Bacteria TMDL: Significant Dates

Date	Action
120 days after the effective date of this TMDL	Responsible jurisdictions and responsible agencies must submit a comprehensive bacteria water quality monitoring plan for the Malibu Creek Watershed to the Executive Officer of the Regional Board. The plan must be approved by the Executive Officer before the monitoring data can be considered during the implementation of the TMDL. In developing the 13267 order, the EO will consider costs in relation to the need for data. With respect to benefits to be gained, the TMDL staff report demonstrates the significant impairment and bacteria loading. Further documenting success or failure in achieving waste load allocations will benefit the responsible agencies and all recreational water users. The purpose of the plan is to better characterize existing water quality as compared to water quality at the reference watershed,- and ultimately, to serve as a compliance monitoring plan. The plan must provide for analyses of all applicable bacteria indicators for which the Basin Plan has established objectives including E. coli. For fresh water and enterococcus for marine water. The plan must also include sampling locations that are specified in Table 7-10.2, at least one location in each subwatershed, and areas where frequent REC-1 use is known to occur. However, this is not to imply that a mixing zone has been applied; water quality objectives apply throughout the watershed—not just at the sampling locations.
1 year after effective date of this TMDL	1. Responsible jurisdictions and responsible agencies shall provide a written report to the Regional Board outlining how each intends to cooperatively achieve compliance with the TMDL. The report shall include implementation methods, an implementation schedule, and proposed milestones. Specifically, the plan must include a comprehensive description of all steps to be taken to meet the 3-year summer dry weather compliance schedule, including but not limited to a detailed timeline for all category of bacteria sources under their jurisdictions including but not limited to nuisance flows, urban stormwater, on-site wastewater treatment systems, runoff from homeless encampments, horse facilities, and agricultural runoff. 2. If the responsible jurisdiction or agency is requesting an extension of the summer dry-weather compliance schedule, the plan must include a description of all local ordinances necessary to implement the detailed workplan and assurances that such ordinances have been adopted before the request for an extension is granted. 3. Local agencies regulating on-site wastewater treatment systems shall provide a written report to the Regional Board's Executive Officer detailing the rationale and criteria used to identify high-risk areas where on-site systems have a potential to impact surface waters in the Malibu Creek watershed. Local agencies may use the approaches outlined below in (a) and (b), or an alternative approach as approved

Date	Action
	by the Executive Officer. (a) Responsible agencies may screen for high-risk areas by establishing a monitoring program to determine if discharges from OWTS have impacted or are impacting water quality in Malibu Creek and/or its tributaries. A surface water monitoring program demonstration must include monitoring locations upstream and downstream of the discharge, as well as a location at mid-stream (or at the approximate point of discharge to the surface water) of single or clustered OWTS. Surface water sampling frequency will be weekly for bacteria indicators and monthly for nutrients. A successful demonstration will show no statistically significant increase in bacteria levels in the downstream sampling location(s). (b) Responsible agencies may define the boundaries of high-risk or contributing areas or identify individual OWTS that are contributing to bacteria water quality impairments through groundwater monitoring or through hydrogeologic modeling as described below: (1) Groundwater monitoring must include monitoring in a well no greater than 50-feet hydraulically downgradient from the furthermost extent of the disposal area, or property line of the discharger, whichever is less. At a minimum, sampling frequency for groundwater monitoring will be quarterly. The number, location and construction details of all monitoring wells are subject to approval of the Executive Officer. (2) Responsible agencies may use a risk assessment approach, which uses hydrogeologic modeling to define the boundaries of the high-risk and contributing areas. A workplan for the risk assessment study must be approved by the Executive Officer of the Regional Board. 4. OWTS located in high-risk areas are subject to system upgrades as necessary to demonstrate compliance with applicable effluent limits and/or receiving water objectives. 5. If a responsible jurisdiction or agency is requesting an extension to the wet-weather compliance schedule, the plan must include a description of the integrated water resources (IRP) approach to be implemented, identification of potential markets for water re-use, an estimate of the percentage of collected stormwater that can be re-used, identification of new local ordinances that will be required, a description of new infrastructure required, a list of potential adverse environmental impacts that may result from the IRP, and a workplan and schedule with significant milestones identified. Compliance with the wet-weather allocations

Date	Action
	shall be as soon as possible but under no circumstances shall it exceed 10 years for non-integrated approaches or extend beyond July 15, 2021 for an integrated approach. The Regional Board staff will bring to the Regional Board the aforementioned plans for consideration of extension of the wet-weather compliance date as soon as possible.
2 years after the effective date of this TMDL	The California Department of Parks and Recreation shall provide the Regional Board Executive Officer, a report quantifying the bacteria loading from birds to the Malibu Lagoon. The Regional Board's Executive Officer shall require the responsible jurisdictions and responsible agencies to provide the Regional Board with a reference watershed study. The study shall be designed to collect sufficient information to establish a defensible reference condition for the Malibu Creek and Lagoon watershed.
3 years after effective date of this TMDL** ** May be extended to up to 6 years from the effective date of this TMDL	Achieve compliance with the applicable Load Allocations and Waste Load Allocations, as expressed in terms of allowable days of exceedances of the single sample bacteria limits and the 30-day geometric mean limit during summer dry-weather (April 1 to October 31). In response to a written request from a responsible jurisdiction or responsible agency, the Executive Officer of the Regional Board may extend the compliance date for the summer dry-weather allocations from 3 years to up to 6 years from the effective date of this TMDL. The Executive Officer's decision to extend the summer dry-weather compliance date must be based on supporting documentation to justify the extension, including a detailed work plan, budget and contractual or other commitments by the responsible jurisdiction or responsible agency.
3 years after effective date of this TMDL	The Regional Board shall reconsider this TMDL to: (1) Consider a natural source exclusion for bacteria loadings from birds in the Malibu Lagoon if all anthropogenic sources to the Lagoon have been controlled. (2) Reassess the allowable winter dry-weather and wet-weather exceedances days based on additional data on bacterial indicator densities, and an evaluation of site-specific variability in exceedance levels to determine whether existing water quality is better than water quality at the reference watershed, (3) Reassess the allowable winter dry-weather and wet-weather exceedance days based on a re-evaluation of the selected

Date	Action
	reference watershed and consideration of other reference watersheds that may better represent reaches of the Malibu Creek and Lagoon. (4) Consider whether the allowable winter dry-weather and wet-weather exceedance days should be adjusted annually dependent on the rainfall conditions and an evaluation of natural variability in exceedance levels in the reference system(s), (5) Re-evaluate the reference year used in the calculation of allowable exceedance days, and (6) Re-evaluate whether there is a need for further clarification or revision of the geometric mean implementation provision.
6 years after the effective date of this TMDL	Achieve compliance with the applicable Load Allocations and Waste Load Allocations, expressed as allowable exceedance days during winter dry weather (November 1-March 31) single sample limits and the rolling 30-day geometric mean limit.
10 years after the effective date of this TMDL ** May be extended up to July 15, 2021.	Achieve compliance with the wet-weather Load Allocations and Waste Load Allocations (expressed as allowable exceedance days for wet weather and compliance with the rolling 30-day geometric mean limit.) The Regional Board may extend the wet-weather compliance date up to July 15, 2021 at the Regional Board's discretion, by adopting a subsequent Basin Plan amendment that complies with applicable law.

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APPENDIX B

Site Id: MCW-1		
Historical Site Id: LVMWD (R-11)	**Subwatershed:** Malibu Lagoon (below PCH)	**Coordinates: N** 34°02.069' **W** 118°40.969'
Comments: This site is located below the bridge on PCH near Cross Creek Road. *LVMWD is the sampling entity & will continue to monitor at this location monthly. *Required by the TMDL.		

Site Id: MCW-2		
Historical Site Id: LVMWD (R-3)	**Subwatershed:** Lower Malibu Creek	**Coordinates: N** 34°02.825' **W** 118°41.371'
Comments: Inside Serra Canyon Community at 23500 Palm Canyon. This site is located 3 miles below Tapia. This site is accessed through a private community off of PCH called Serra. *LVMWD is the sampling entity & will continue to monitor at this location monthly. *Required by the TMDL.		

Site Id: MCW-3		
Historical Site Id: LVMWD (R-2)	**Subwatershed:** Middle Malibu Creek	**Coordinates: N** 34°04.654' **W** 118°42.105'
Comments: This site is located off of Malibu Canyon Road below Tapia discharge 001. *LVMWD is the sampling entity & will continue to monitor at this location monthly. *Required by the TMDL.		

Site Id: MCW-4		
Historical Site Id: LVMWD (R-9)	**Subwatershed:** Upper Malibu Creek	**Coordinates: N** 34°06.001' **W** 118°43.364'
Comments: This site is located at Malibu Creek in L.A. County unincorporated area above the confluence with Las Virgenes Creek. *LVMWD is the sampling entity & will continue to monitor at this location monthly. *Required by the TMDL.		

Site Id: MCW-5		
Historical Site Id: CC	**Subwatershed:** Cold Creek	**Coordinates: N** 34°04.739' **W** 118°41.996'
Comments: From 101 Freeway, go south on Las Virgenes Road. Make a left on Piuma Road. Off of Piuma Road, between Crater Camp Drive and Live Oak Circle Drive. There is a dead tree that has a cat carved into it which is across the street from the site. *The City of Calabasas is the sampling entity. Sampling frequency is not known at this time.		

Site Id: MCW-6		
Historical Site Id: New Site	**Subwatershed:** Stokes Creek	**Coordinates: N** 34°05.889' W 118°42.748'
Comments: This site is located in Malibu Creek State Park. Once you enter Malibu Creek State Park from the Las Virgenes Road entrance, pass the booth and make an immediate left onto the gravel road. Continue down the road until you reach the tan and green building. Access to the creek is located behind the tan and green building.		

Site Id: MCW-7		
Historical Site Id: Heal the Bay site #5	**Subwatershed:** Lower Las Virgenes Creek	**Coordinates: N** 34°05.769' **W** 118°43.072'
Comments: This site is located in Malibu Creek State Park. It is off a bridge near the Las Virgenes Road entrance. Site is located directly above area that is used for recreation so the results aren't skewed by contributions of bacteria from recreational users. *The RWQCB and Heal the Bay are the sampling entities. Sampling frequency is not known at this time. *Required by the TMDL.		

Site Id: MCW-8b		
Historical Site Id: New Site	**Subwatershed:** Upper Las Virgenes Creek	**Coordinates: N** 34°10.115' **W** 118°42.102'
Comments: Site is located at north end of Las Virgenes Road and is accessed through a Los Angeles County Flood Control gate. Sample is taken just downstream county line demarcated by chain link fence.		

Site Id: MCW-9		
Historical Site Id: New Site	**Subwatershed:** Chesebro Creek	**Coordinates: N** 34°09.082' **W** 118°44.058'
Comments: Site is located on Chesebro Road. approximately 0.5 miles north of Driver Ave. and is accessed from bridge crossing over creek. Sample is taken just upstream confluence of Palo Comado Creek and Chesebro Creek.		

Site Id: MCW-10		
Historical Site Id: Site #3	**Subwatershed:** Palo Comado Creek	**Coordinates: N** 34°08.585' **W** 118°45.468'
Comments: From the 101 Freeway, exit Kanan Road and go south. Make a left onto Agoura Road and enter the Los Angeles County yard (on your right side). *LACDPW was the sampling entity. Sampling at this site has concluded.		

Site Id: MCW-11		
Historical Site Id: Med2	**Subwatershed:** Lower Medea Creek	**Coordinates: N** 34°06.921' **W** 118°45.339'
Comments: This site is situated in Paramount Ranch (Santa Monica Mountains National Recreation Area) at the Cornell Road entrance at the bridge at the edge of the parking lot. *The RWQCB and the City of Calabasas is the sampling entity. Sampling frequency is not known at this time. *Required by the TMDL.		

Site Id: MCW-12		
Historical Site Id: Med1	**Subwatershed:** Upper Medea Creek	**Coordinates: N** 34°10.230' **W** 118°45.765'
Comments: Site is located at the west end of Tamarind Street and is accessed by climbing down publicly accessed embankment. Sample is taken upstream of the pedestrian bridge.		

Site Id: MCW-13		
Historical Site Id: Site #5	**Subwatershed:** Lower Lindero Creek	**Coordinates: N** 34°08.592’ **W** 118°45.842’
Comments: Downstream of Lindero Lake at the end of an underground concrete culvert on the south side of Agoura Road west of Kanan Road. It outlets to a scour pond of concrete riprap leading to a natural channel. *LACDPW was the sampling entity. Sampling at this site has concluded..		

Site Id: MCW-14b		
Historical Site Id: New Site	**Subwatershed:** Upper Lindero Creek	**Coordinates: N** 34°09.943’ **W** 118°47.268’
Comments: Site is located near the Yerba Buena Elementary School at the north end of Reyes Adobe Rd. and is accessed by using a gate on the east side of the parking lot. Sample is taken at end of dirt path leading from access gate.		

Site Id: MCW-15b		
Historical Site Id: New Site	**Subwatershed:** Westlake Creek / Russel Branch	**Coordinates: N** 34°09.263’ **W** 118°48.693’
Comments: Site is located on La Tienda Drive just west of Oaks Christian High School and is accessed through a Los Angeles County Flood Control gate. Sample is taken downstream of the debris basin.		

Site Id: MCW-16		
Historical Site Id: TRI	**Subwatershed:** Triunfo Creek	**Coordinates: N** 34°06.438' **W** 118°46.073'
Comments: Triunfo Creek before it feeds into Malibou Lake. From the 101 Freeway, exit Kanan Road and go south on Kanan Road. Make a left on Troutdale Drive. Make a left onto Mulholland Hwy, then make a right on Lake Vista Drive. Make a right into Green Willow Ranch and stop at the bridge. *The RWQCB and the City of Calabasas are the sampling entities. Sampling frequency is not known at this time. *Required by the TMDL		

Site Id: MCW-17		
Historical Site Id: POT	**Subwatershed:** Potrero Canyon Creek	**Coordinates: N** 34°08.696' **W** 118°50.165'
Comments: Site is located on Triunfo Canyon Road approximately 0.4 miles south of Westlake Boulevard and is accessed through a Ventura County Watershed Protection District gate (805) 654-5000. Sample is taken from the middle channel of the concrete apron.		

Site Id: MCW-18		
Historical Site Id: New Site	**Subwatershed:** Hidden Valley Creek	**Coordinates: N** 34°08.474' **W** 118°52.673'
Comments: Site is located on Potrero Road approximately 0.45 miles south of Thornton Ranch Road and is accessed near the bridge crossing. Sample is taken upstream the bridge.		

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APPENDIX C

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VENTURA COUNTY
WATERSHED PROTECTION DISTRICT

PUBLIC WORKS AGENCY
RONALD C. COONS
Agency Director

January 24, 2008

Jeff Pratt
District Director

Gerhardt Hubner
Water/Environmental Resources

Peter Sheydayi
Design/Construction

Sergio Vargas
Planning/Regulatory

Tom Lagier
Operations/Maintenance

Mr. Donald Wolfe
Director of Public Works
County of Los Angeles Department of Public Works
Watershed Management Division
900 South Fremont Avenue
Alhambra, Ca 91803

SUBJECT: COMMITMENT TO MONITOR MALIBU CREEK BACTERIA TOTAL MAXIMUM DAILY LOAD (TMDL) COMPLIANCE MONITORING SITES.

Dear Mr. Wolfe:

The County of Ventura, a participating agency in the Malibu Creek Watershed Integrated TMDL Working Group, will provide services to conduct bacteria monitoring at seven surface water compliance monitoring sites as shown on the attached map.

These compliance sites are as follows:

MCW - 8b (Las Virgenes Creek)
MCW - 9 (Cheseboro Creek)
MCW - 12 (Upper Medea Creek)
MCW - 14b (Upper Lindero Creek)
MCW - 15b (Westlake/Russell Branch)
MCW - 17 (Potrero Canyon Creek)
MCW - 18 (Hidden Valley Creek)

The County will comply and follow standard sampling protocols as outlined in the approved Compliance Monitoring Plan (CMP) for the Malibu Creek Bacteria TMDL. We appreciate the cooperative effort LA County staff have shown during this process and acknowledge the hard work put forth by both Ventura and LA County on this matter.

If you have any questions regarding this matter, please contact Paul Tantet at (805) 662-6737.

Sincerely,

Gerhardt Hubner
Deputy Director

Attachment: MCW TMDL Compliance Monitoring Sites