October 2018

California Department of Transportation

Monitoring Results Report:
Fiscal Year 2017–18

CTSW-RT-18-350.01.03

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15. Abstract

The Caltrans NPDES Permit requires water quality monitoring at ASBS and TMDL sites, also referred to as Tier 1 monitoring sites. The results of this water quality monitoring and a summary of sites requiring corrective action are to be reported annually in the Monitoring Results Report (MRR). This MRR includes data for Fiscal Year 2017–18.

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MRR, ASBS monitoring, TMDL monitoring, water quality results, cooperative agreements, corrective action	None	210 (excluding attachments)

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LIST OF ABBREVIATIONS AND ACRONYMS

Annual Report	2017–18 Stormwater Management Program Annual Report
ASBS	Area (or Areas) of Special Biological Significance
Basin Plan	Water Quality Control Plan
BMP	Best Management Practice
Caltrans	California Department of Transportation
Ce. Coast	Central Coast
CEDEN	California Environmental Data Exchange Network
CO	Coupled Outfall
CTR	California Toxics Rule
MOA	Memoranda of Agreement
MRR	Monitoring Results Report
No. CA	Northern California
NPDES	National Pollutant Discharge Elimination System
NWQ	Natural Water Quality
ORA	Ocean Reference Area
ORW	Ocean Receiving Water
Permit	Caltrans NPDES Statewide Storm Water Permit Order No. 2012-0011-DWQ
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QPF	Quantitative Precipitation Forecast
Regional Water Board	Regional Water Quality Control Board
RMG	Regional Monitoring Group
SCCWRP	Southern California Coastal Water Research Project
Site ID	Site Identifier
SMARTS	Storm Water Multiple Application and Report Tracking System
So. CA	Southern California
State Water Board	State Water Resources Control Board
SWAMP	Surface Water Ambient Monitoring Program
TMDL	Total Maximum Daily Load
UO	Uncoupled Outfall
WLA	Waste Load Allocation
WQS	Water Quality Standard

Section 1
INTRODUCTION

1.1 BACKGROUND AND PURPOSE

This Monitoring Results Report (MRR) is being submitted pursuant to reporting requirements in the California Department of Transportation (Caltrans) National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit Order No. 2012-0011-DWQ (Permit), Section E.2.c.5 (State Water Board 2012). The NPDES Permit requires monitoring to be conducted in two tiers. Tier 1 consists of all sites for which monitoring is required pursuant to the Areas of Special Biological Significance (ASBS) Special Protections and for which monitoring is required pursuant to an approved Total Maximum Daily Load (TMDL) in an impaired watershed where Caltrans has been assigned a Waste Load Allocation (WLA). Tier 2 consists of effluent and receiving water sites that are not a part of ASBS or TMDL monitoring.

The NPDES Permit requires that the MRR include:

- A list of all Tier 1 and Tier 2 sites that had been actively monitored during the past fiscal year, i.e., from July 1 of the prior year through June 30 of the current year;

- Results of the past fiscal year's monitoring activities, including effluent and receiving water quality monitoring, with sample values exceeding applicable Water Quality Standards (WQSs) highlighted; and

- A summary of sites requiring corrective actions needed to achieve compliance, and a review of any iterative procedures (where applicable) at sites needing corrective actions.

1.2 NUMBER OF ACTIVE MONTIORING SITES

For the 2017–18 wet season, 102 Tier 1 sites were actively monitored by Caltrans. These sites consisted of:

- ASBS Monitoring Program, 48 sites
- TMDL Monitoring Program, 38 sites
- Best Management Practice (BMP) Pilot Monitoring sites, 10 sites
- Cooperative Agreement Monitoring, 6 sites

The total number of Tier 1 sites exceeded the NPDES Permit requirement of 100; therefore, no Tier 2 sites were monitored during the 2017–18 wet season.

For the 2017–18 wet season, Caltrans participated in eight cooperative agreements, six of these cooperative agreements include provisions to perform monitoring activities related to adopted TMDLs. Per agreement with the State Water Resources Control Board (State Water Board), each cooperative monitoring agreement would count as one Tier 1 monitoring site (see email in Appendix B). Details on the six Cooperative Monitoring Agreements counted as Tier 1 sites are listed in Table 1.01 below.

Table 1.01. Cooperative Monitoring Agreements Counted as Tier 1 Sites

Cooperative Monitoring Agreement Title
Aquatic Science Center
Ventura River Estuary Trash TMDL
Santa Monica Bay Dry and Wet Weather Bacteria TMDL Coordinated Shoreline Water Quality Monitoring Program
Memoranda of Agreement (MOA) for Contaminated Sediment Management Plan for the Dominguez Channel
MOA for Receiving Water Monitoring for Ventura River Algae TMDL
Lake Elsinore & San Jacinto Watersheds Authority (LESJWA)

1.3 PRESENTATION OF WATER QUALITY DATA

Water quality monitoring data for storm events successfully monitored at ASBS sites are presented in Section 2. Water quality monitoring data for storm events successfully monitored at TMDL sites are presented in Section 3. In the future, if monitoring is conducted at Tier 2 sites, effluent and receiving water quality monitoring data will be presented in Section 4. No Tier 2 sites were monitored for the 2017–18 wet season.

Water quality data for each site are provided in a data table. Data for each constituent analyzed are reported as they were received from the analytical laboratories via electronic data deliverable to the California Environmental Data Exchange Network (CEDEN). The number of significant figures used to report data may vary throughout this document due to reporting by different laboratories, and in some cases, different dilutions. Results from quality assurance/ quality control (QA/QC) samples are not included in data tables but are included in Appendix A, Water Quality Data for the 2017–18 Wet Season.

The available reports for monitoring activities conducted under cooperative agreements are provided in Appendix B, Monitoring Reports from Cooperative Agreements. Appendix B includes reports from the 2016–17 wet season issued after July 1, 2017 (i.e., not included in the previous MRR), and reports from the 2017–18 wet season submitted through September 1, 2017.

1.3.1 Monitoring Site Identification Number

Each monitoring site in this report is designated by a unique monitoring site identifier (Site ID). Site IDs are composed of two parts separated by a hyphen; the first part is the number of the Caltrans district in which the monitoring site resides, and the second part is a three-digit number, generally assigned on a sequential basis. For example, Monitoring Site 306 in Caltrans District 5 is identified as Site 5-306. The site number portion of a Site ID is not unique; individual sites in different Caltrans districts can be assigned the same site number. For example, site number 306 exists in Caltrans District 2 (Site 2-306) and in Caltrans District 5 (Site 5-306).

1.3.2 Surface Water Ambient Monitoring Program Comparability

All monitoring during the 2017–18 wet season was conducted in accordance with Surface Water Ambient Monitoring Program (SWAMP)-compliant Quality Assurance Project Plans (QAPPs). The data reported in this MRR is SWAMP comparable.

1.3.3 Quality Assurance/Quality Control Samples

Under the ASBS and TMDL monitoring programs, samples marked as QA/QC are only used for QA/QC analysis. These QA/QC results are not included in the data tables in this MRR but are included in Appendix A.

1.4 DATA SUBMITTAL

The NPDES Permit requires all receiving water and effluent water quality data to be uploaded to the Storm Water Multiple Application and Report Tracking System (SMARTS) and all receiving water monitoring data to be uploaded to CEDEN. However, the SMARTS system is unable to receive stormwater monitoring data from Caltrans.

Therefore, Caltrans has opted to (1) upload all monitoring data to the CEDEN system, and (2) provide all monitoring data in a spreadsheet, with three worksheets, as an appendix to this MRR. There is one worksheet for general chemistry data, one worksheet for field data, and one worksheet for toxicity data. The data upload for the 2017–18 wet season to CEDEN is expected to be completed by fall 2018. All data for the 2017–18 wet season, including associated QA/QC data, are included in Appendix A.

1.4.1 Limitations of the Data

All data (i.e., data from both ASBS and TMDL sites) for the 2017–18 wet season have been reviewed. However, not all data have been finalized due to the delayed submittal of some electronic data deliverables by laboratories. It is possible that some values may change once the data are finalized. Caltrans will issue an addendum or errata sheet to this report if there are any changes.

1.4.2 Relation to the Annual Report

The 2017–18 Stormwater Management Program Annual Report (Annual Report) describes the stormwater management activities Caltrans performed from July 1, 2017, to June 30, 2018. The Annual Report includes a description of the monitoring activities in Section 3 and a summary of the monitoring results in Section 16. The same information is shared in both the Annual Report and the MRR. The Annual Report was finalized before the finalization of the MRR. Therefore, it is possible there are inconsistencies between the two documents due to edits made to the MRR after the finalization of the Annual Report. These inconsistencies are noted where applicable.

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Section 2
ASBS MONITORING

2.1 OVERVIEW

The ASBS monitoring was conducted in accordance with the NPDES Permit, Section E.2.c.2)a)i), also referred to as the Special Protections. The ASBS monitoring comprises the following:

1. Core Discharge Monitoring Program

2. Ocean Receiving Water and Reference Area Monitoring Program

The Core Discharge Monitoring Program consists of estimating runoff flow measurements and collecting grab samples of runoff at outfalls equal to or greater than 18 inches in diameter or width. The Ocean Receiving Water and Reference Area Monitoring Program includes (1) collecting grab samples from the surf zone in the ocean at the point where runoff from an outfall discharges into the ocean, and (2) collecting grab samples from ocean reference area sites where flow from a natural drainage discharges into the ocean.

The Special Protections prescribe two options for fulfilling the monitoring requirements associated with the Ocean Receiving Water and Reference Area Monitoring Program:

Option 1. Conduct an Individual Monitoring Program, or

Option 2. Participate in a Regional Integrated Monitoring Program.

Caltrans chose Option 2. Caltrans entered into data sharing agreements with the three ASBS Regional Monitoring Groups (RMGs): Northern California (No. CA), Central Coast (Ce. Coast), and Southern California (So. CA). Under these agreements, Caltrans provides the results of its ocean receiving water (ORW) monitoring to the RMGs. Caltrans did not receive any data collected by others. Caltrans only receives the calculated natural water quality (NWQ) values, also referred to as the 85th percentile values, which are calculated from ocean reference area (ORA) data.

Attachment III of the NPDES Permit lists the 77 ASBS high-priority discharge locations to be monitored. These 77 high-priority discharge locations were originally identified in March 2001 (SCCWRP 2003). Some of these 77 locations have been replaced by alternate locations due to, for example, safety concerns, landslides, and a lack of connectivity to the ocean. Additionally, monitoring in ASBS 05, 08, 09, 15, and 34 has been suspended pending analysis of water quality data by the State Water Board. Monitoring in ASBS 33 has also been suspended. As noted in last year's MRR, Section 6.1, the State Water Board has agreed to remove from the Permit four of the five ASBS 33 monitoring sites that either do not directly discharge to the ocean or do not consist of Caltrans runoff, and suspended future monitoring requirements at ASBS 33 until the implementation of BMPs, as identified in Caltrans ASBS Compliance Plan. Therefore, monitoring only occurred in ASBS 24 for the 2017–18 wet season. Table 2.01 lists the seven ASBS with Caltrans priority discharges and the corresponding RMG. A map of California that shows the approximate location of the seven ASBS is provided in Figure 2.01.

Table 2.01. ASBS with Caltrans Discharges

ASBS No.	ASBS Name	RMG	2017–18 Wet Season Monitoring Status
05	Kelp Beds at Saunders Reef	Northern California (No. CA)	Suspended, Pending Analysis
08	Redwoods National Park	Northern California (No. CA)	Suspended, Pending Analysis
09	James V. Fitzgerald Marine Reserve	Central Coast (Ce. Coast)	Suspended, Pending Analysis
15	Ano Nuevo Point and Island	Central Coast (Ce. Coast)	Suspended, Pending Analysis
24	Laguna Point to Latigo Point	Southern California (So. CA)	Monitored
33	Irvine Coast Marine Life Refuge	Southern California (So. CA)	Suspended, Pending BMP Implementation
34	Carmel Bay	Central Coast (Ce. Coast)	Suspended, Pending Analysis

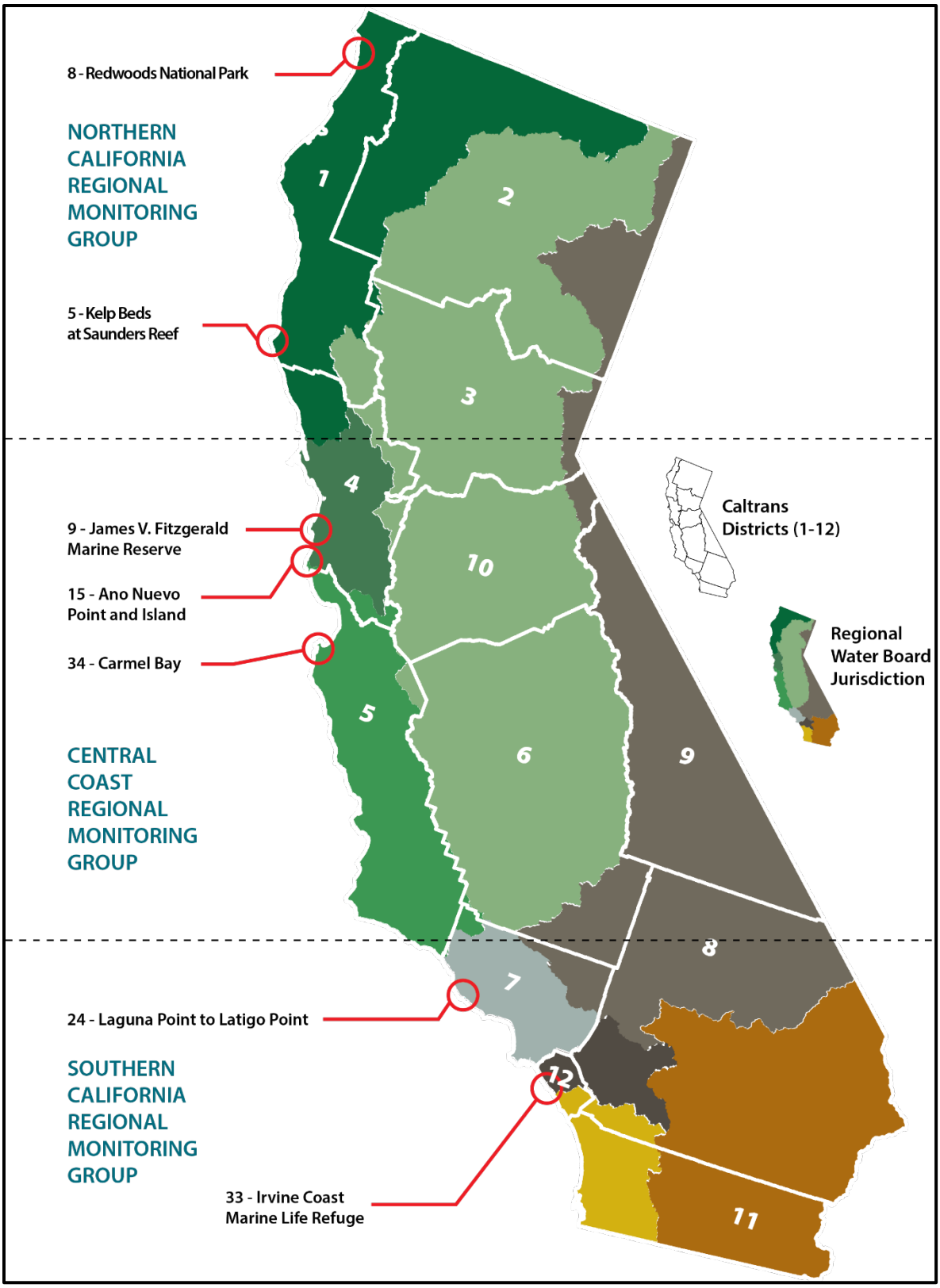

Figure 2.01. ASBS Affected by Caltrans Discharges

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ASBS outfalls are classified as either Coupled or Uncoupled Outfalls. Coupled outfalls (CO) are associated with Ocean Receiving Water (ORW) sites and Uncoupled Outfalls (UO) are not. ORW sites are located in the surf zone of the ocean adjacent to coupled outfalls. The Ocean Reference Area (ORA) sites are located in the surf zone of the ocean at mouths of open space watersheds with typically less than 10 percent development. The ORA and ORW sites are approved by State Water Board staff.

The constituent lists vary among RMG areas, and the constituent lists are based on the ASBS Special Protections, the California Ocean Plan, the QAPPs for each RMG, and discussions with State Water Board staff. The RMGs have completed their respective monitoring, and Caltrans continues to use the RMG area QAPPs. The constituent lists are described further in the Caltrans Quality Assurance Project Plan (Caltrans 2017). ORW samples are only collected when the stormwater runoff from the coupled outfall is observed to reach the ORW site.

The NPDES Permit requires a minimum of three storm events to be captured per wet season, over two wet seasons, at the ORW and CO sites—see Sections E.2.c.2)a)i)(2)(b)(i) and (iii). Each UO is required to be sampled once per season as agreed upon by the State Water Board. The target number of samples to be collected for each type of monitoring each wet season are listed in Table 2.02.

Table 2.02. Target Number of Samples Per Wet Season by Monitoring Type

Monitoring Type	Number of Samples	Pre-Storm Sample	Post-Storm Sample[1]
Core Discharge Monitoring Program			
Coupled Outfall sites	3		✓
Uncoupled Outfall sites	1		✓
Ocean Receiving Water and Reference Area Monitoring Program			
Ocean Receiving Water (ORW) sites	3	✓	✓
Ocean Reference Area (ORA) sites	See Note 2	See Note 2	See Note 2

Notes:

1. A post-storm sample refers to a sample collected during, or immediately after, a storm event.
2. The Natural Water Quality values, discussed in Section 2.3, have been finalized. Therefore, no more monitoring is required at the ORA sites.

2.1.1 Monitoring Sites

Table 2.03 lists the actively monitored sites for the ASBS Monitoring Program for the 2017–18 wet season. Information in these tables includes site identification number, site name, monitoring type, Regional Water Quality Control Board (Regional Water Board) region number, and the latitude and longitude for each site.

Table 2.03. ASBS 24 Monitoring Sites

Site ID	Site Name	Monitoring Type[1]	Regional Water Board	Latitude	Longitude
7-343	MUG005	Outfall, >36”	4	34.083896	-119.03821
7-345	MUG010	Outfall, Coupled	4	34.070804	-119.014826
7-346	MUG013	Outfall, <36”	4	34.065445	-118.993551
7-347	MUG016	Outfall, <36”	4	34.062852	-118.987069
7-348	MUG028	Outfall, <36”	4	34.058928	-118.974165
7-350	MUG041	Outfall, <36”	4	34.053461	-118.964271
7-351	MUG046	Outfall, <36”	4	34.052112	-118.960862
7-352	MUG048	Outfall, <36”	4	34.05172	-118.9594833
7-353	MUG049	Outfall, <36”	4	34.05165	-118.9594333
7-354	MUG051	Outfall, <36”	4	34.050937	-118.957316
7-355	MUG053	Outfall, <36”	4	34.050248	-118.95539
7-356	MUG058	Outfall, <36”	4	34.048355	-118.95042
7-357	MUG059	Outfall, <36”	4	34.048835	-118.9515
7-358	MUG061	Outfall, <36”	4	34.047675	-118.94834
7-359	MUG066	Outfall, <36”	4	34.04714	-118.924654
7-360	MUG070	Outfall, <36”	4	34.04600	-118.9320000
7-361	MUG073	Outfall, <36”	4	34.046418	-118.922723
7-362	MUG077	Outfall, <36”	4	34.04513	-118.9345833
7-363	MUG078	Outfall, <36”	4	34.045431	-118.934358
7-364	MUG135	Outfall, <36”	4	34.041983	-118.897426
7-365	MUG147	Outfall, <36”	4	34.041553	-118.894154
7-366	MUG150	Outfall, <36”	4	34.040872	-118.889212
7-367	MUG187	Outfall, <36”	4	34.039285	-118.869505
7-368	MUG283	Outfall, >36”	4	34.02589	-118.765915
7-370	MUG346	Outfall, <36”	4	34.02508	-118.783588

Site ID	Site Name	Monitoring Type[1]	Regional Water Board	Latitude	Longitude
7-371	MUG355	Outfall, <36”	4	34.02122	-118.829258
7-372	SAD0950	Outfall, <36”	4	34.02699	-118.8385500
7-373	SAD0960	Outfall, <36”	4	34.02619	-118.8375000
7-374	SAD0970	Outfall, <36”	4	34.02535	-118.8364600
7-375	SAD0980	Outfall, >36”	4	34.02435	-118.8348600
7-376	SAD0990	Outfall, >36”	4	34.02302	-118.8326600
7-377	SAD1000	Outfall, <36”	4	34.02123	-118.8303400
7-378	SAD1040	Outfall, <36”	4	34.01748	-118.8256600
7-379	SAD1050	Outfall, <36”	4	34.01700	-118.8249200
7-380	SAD1060	Outfall, >36”	4	34.01559	-118.8225400
7-381	SAD1030	Outfall, <36”	4	34.018711	-118.827049
7-383	MUG318	Outfall, <36”	4	34.023879	-118.834316
7-384	ALT004	Outfall, <36”	4	34.08609	-119.059097
7-385	ALT005	Outfall, <36”	4	34.085415	-119.054291
7-386	ALT006	Outfall, <36”	4	34.085361	-119.048653
7-387[2]	ALT007	Outfall, <36”	4	34.085297	-119.047752
7-388	ALT008	Outfall, <36”	4	34.062325	-118.985931
7-389	ALT009	Outfall, <36”	4	34.059978	-118.975975
7-390	ALT010	Outfall, <36”	4	34.047873	-118.948184
7-391	ALT011	Outfall, <36”	4	34.045355	-118.939404
7-393	ALT017	Outfall, <36”	4	34.025805	-118.777059
7-407	MUG010RW	Ocean Receiving Water	4	34.070663	-119.014887
7-408[3]	MUG014	Outfall, <36”	4	34.063880	-118.989433

Notes:

1. Previously outfalls under 36 inches in diameter were categorized as 18 inches to 36 inches because outfalls less than 18 inches in diameter were not monitored. Because several currently monitored outfalls are less than 18 inches in diameter, all outfalls less than 36 inches are grouped in a single category and monitored the same.
2. The UO at Site 7-400 (ALT018) was removed and replaced with Site 7-387 (ALT007).
3. The UO at Site 7-349 (MUG031) was removed and replaced with Site 7-408 (MUG014).

2.2 RESULTS

The monitoring results for ASBS are presented in data tables. The data tables contain the 2017–18 data for CO, UO, and ORW sites. The tables also contain the estimated annual runoff volume if the ASBS site is an outfall, i.e., CO or UO. The estimated annual runoff volume is based on the Caltrans tributary area. The method for calculating the annual runoff volume is provided in Appendix C, ASBS Additional Information. A data table for the ORW site for all storm events monitored from the 2012–13 wet season through the 2017–18 wet season is included in Section 2.3. The data table in Section 2.3 contains the comparisons to NWQ values.

Results from QA/QC samples, e.g., field blanks and field duplicates, are not included in these tables. All water quality data, including QA/QC sample results, are provided in Appendix A. Results for field duplicates are used for QA/QC purposes only—the results of the original sample and field duplicate sample are not averaged together.

2.2.1 Changes from the 2016–17 Wet Season

The following changes were made to the ASBS Monitoring Program for the 2017–18 wet season.

Cessation of Monitoring. The State Water Board has approved the suspension of monitoring activities for ASBS 05, 08, 09, 15, and 34 during their review of the completion of Caltrans monitoring requirements at these locations.

The State Water Board issued a letter to Caltrans (Appendix E) releasing Caltrans from monitoring requirements in ASBS 33 during the 2016–17 wet season. This is based on the determination that only one of the five identified Caltrans outfalls directly drain to the ASBS and that stormwater BMPs are to be implemented at this site per the Caltrans ASBS Compliance Plan.

Monitoring Sites. Due to sampling site damage and safety concerns raised during the 2016–17 wet season, several monitoring locations were changed.

- **ASBS 24 (Laguna Point to Latigo Point)**. The UO at Site 7-349 (MUG031) no longer exists. The outfall device was destroyed in a landslide caused by tidal activity in 2016.

The site was replaced by Site 7-408 (MUG014); the UO at Site 7-400 (ALT018) was removed in June 2017, the State Water Board visited Site 7-400 and due to potential connectivity issues at the site, provided verbal approval to use Site 7-387 (ALT007) as the replacement site for 7-400. The replacement sites were determined to provide the same representative characterization of Caltrans discharge as the previous sites.

Regional Monitoring Groups. The three RMGs did not monitor during the 2017–18 wet season since their respective monitoring has been completed. Caltrans was the only ASBS discharger conducting monitoring activities during the 2017–18 wet season. Appendix C provides additional information on monitoring and reporting by the RMGs for previous wet seasons.

2.2.2 Storm Event Summary

The mobilization criteria to qualify a storm event for ASBS monitoring is provided below. These criteria apply to outfalls and ORW sites.

1. A potential storm event must have a quantitative precipitation forecast (QPF) of at least 0.1 inch of rainfall with the probability of precipitation equal to or greater than 70 percent. Each ASBS has its own location-specific minimum QPF criteria for mobilization. The location-specific minimum QPF is based on previous experience with various storm event sizes that generate sufficient flow for successful sampling. The location-specific minimum QPFs are provided below:

ASBS	Minimum QPF (in)
ASBS 24, Laguna to Latigo	0.1

2. A potential storm event must be preceded by an antecedent dry period of at least 72 hours without a measurable storm event. A measurable storm event is an event that produces 0.1 inches or more rainfall in a 24-hour period. This 72-hour criterion may be shortened with State Water Board staff approval.

3. Some situations will require best professional judgment to determine whether to qualify a storm event for monitoring.

In addition to the mobilization criteria above, a successful storm event capture requires that the discharge from the coupled outfall must reach the ORW site.

The number of storm events forecasted, false starts, and successfully captured for the ASBS Monitoring Program are presented in Table 2.04.

Table 2.04. 2017–18 Storm Event Summary

ASBS	Number of Forecasted Events	Number of Non-mobilized Storm Events[1, 3]	Number of False Start Storm Events[2, 3]	Number of Successfully Captured Storm Events[2, 3]
ASBS 24 (Laguna to Latigo)	16	13	0	3

Notes:

1. A non-mobilized storm event occurs when a forecasted storm event fails to meet the mobilization criteria at the point in time when a "Go" or "No-Go" decision needs to be made.
2. A false start or successfully captured storm event is a storm event that met the criteria for mobilization and resulted in (a) a successfully captured storm event, (b) an incomplete storm event, (c) a false start, or (d) a ground truthing storm event. An incomplete storm event occurs when a field crew mobilizes to a site, collects the pre-storm samples, but are not able to collect the during-storm samples. A false start occurs when a field crew mobilizes to a site but neither the pre-storm nor during-storm samples are collected. A ground truthing storm event occurs when a field crew mobilizes to a site to verify the approximate drainage area during a storm event—no samples are collected.
3. Number of Non-mobilized Storm Events + Number of False Start Storm Events + Number of Successfully Captured Storm Events = Number of Forecasted Events.

The 2017–18 wet season is the sixth wet season for the ASBS monitoring effort. The cumulative numbers of storm events captured at the ORW sites over the six wet seasons are presented in Table 2.05.

Table 2.05. Cumulative Number of Storm Events Captured at ORW Sites

ASBS	Ocean Receiving Water Site ID	2017–18 Number of Successfully Captured Storm Events	Cumulative Number of Successfully Captured Storm Events[1]	Target Number of Storm Events[3]
ASBS 24 (Laguna to Latigo)	7-369[2]	0	1	6
ASBS 24 (Laguna to Latigo)	7-407	3	6	6

Notes:

1. The target number of storm events is six—three storm events per wet season over two wet seasons. See Permit Sections E.2.c.2)a)i)(2)(b)(ii) and (iii).
2. Coupled Outfall (Site 7-368) location was changed in January 2017, with State Water Board approval, to 7-345. This was due to a sand berm blocking the original Coupled Outfall connectivity with the Ocean Receiving Water (ORW) at this location 7-369. The ORW was replaced by 7-407 because the ORW should be in the mixing zone of 7-345 discharge to the ocean.
3. Three events per season are required only for ORW and CO sites, all UO require only one event per season.

2.2.3 Southern California RMG ASBS Sites

Table 2.06 summarizes the storm event sampling conducted at the So. CA RMG sites during the 2017–18 wet season. Additional site information is provided in Appendix C.

Table 2.06. Caltrans Monitoring Sites in ASBS 24

Site ID	Site Name	Monitoring Type[1]	Event 1/8/2018	Event 03/01/2018	Event 03/21/2018
7-343[1]	MUG005	UO, <36”	✓		
7-345	MUG010	CO	✓	✓	✓
7-407	MUG010RW	ORW	✓	✓	✓
7-346	MUG013	UO, <36”		✓	
7-347	MUG016	UO, <36”	✓		
7-348	MUG028	UO, <36”		✓	
7-349	MUG031	UO, <36”	See Note 2	See Note 2	See Note 2
7-350	MUG041	UO, <36”			✓
7-351	MUG046	UO, <36”	✓		
7-352	MUG048	UO, <36”	✓		
7-353	MUG049	UO, <36”	✓		
7-354	MUG051	UO, <36”	✓		
7-355	MUG053	UO, <36”		✓	
7-356	MUG058	UO, <36”			✓
7-357	MUG059	UO, <36”			✓
7-358	MUG061	UO, <36”			✓
7-359	MUG066	UO, <36”			✓
7-360	MUG070	UO, <36”		✓	
7-361	MUG073	UO, <36”			✓
7-362	MUG077	UO, <36”			✓
7-363	MUG078	UO, <36”			✓
7-364	MUG135	UO, <36”			✓
7-365	MUG147	UO, <36”			✓
7-366	MUG150	UO, <36”		✓	
7-367	MUG187	UO, <36”	✓		
7-370	MUG346	UO, <36”			✓
7-371	MUG355	UO, <36”		✓	

Site ID	Site Name	Monitoring Type[1]	Event 1/8/2018	Event 03/01/2018	Event 03/21/2018
7-372	SAD0950	UO, <36”	See Note 3	See Note 3	See Note 3
7-373	SAD0960	UO, <36”		✓	
7-374	SAD0970	UO, <36”			✓
7-375	SAD0980	UO, >36”			✓
7-376	SAD0990	UO, >36”			✓
7-377	SAD1000	UO, <36”			✓
7-378	SAD1040	UO, <36”	See Note 3	See Note 3	See Note 3
7-379	SAD1050	UO, <36”			✓
7-380	SAD1060	UO, >36”			✓
7-381	SAD1030	UO, <36”			✓
7-383	MUG318	UO, <36”			✓
7-384	ALT004	UO, <36”	✓		
7-385	ALT005	UO, <36”	✓		
7-386	ALT006	UO, <36”	✓		
7-387	ALT007	UO, <36”		✓	
7-388	ALT008	UO, <36”		✓	
7-389	ALT009	UO, <36”		✓	
7-390	ALT010	UO, <36”			✓
7-391	ALT011	UO, <36”	✓		
7-393	ALT017	UO, <36”	✓		
7-400	ALT018	UO, <36”	See Note 4	See Note 4	See Note 4
7-408	MUG014	UO, <36”		✓	
7-368	MUG283	UO, >36”	✓		

Notes:

1. In previous MRRs, Site 7-343 (MUG005) was inadvertently marked as an UO that is greater than 36 inches—the correct size is less than 36 inches.
2. Site 7-349 (MUG031) was an active monitoring site until a landside occurred at some point during the 2016–17 wet season but prior to the fist storm event. Site 7-408 (MUG014) was approved by the Los Angeles Regional Water Board and State Water Board on June 22, 2017, to replace Site 7-349 (MUG031) for the start of the 2017–18 wet season.
3. Site 7-372 and 7-378 were not sampled this season as they were not observed to have discharged to the receiving water.
4. Monitoring at Site 7-344 (MUG008) was halted due to a landslide in March 2015. Site 7-400 (ALT018) was tentatively approved by the State Water Board to replace Site 7-344 (MUG008) for the 2016–17 wet season. However, the Los Angeles Regional Water Board wanted a different site to replace Site 7-344 (MUG008).

Site 7-387 (ALT007) was approved by the Los Angeles Regional Water Board and State Water Board on June 22, 2017, to replace Site 7-344 (MUG008) for the start of the 2017–18 wet season. Site 7-400 (ALT018) was only monitored for the 2016–17 wet season.

A summary of the ASBS 24 wet season is provided below:

- The target number of storm events (three) for the ORW site was successfully captured.
- The target number of storm events (three) for Coupled Outfalls was successfully captured.
- The target number of storm events (one) for Uncoupled Outfalls was successfully captured.

Table 2.07 through Table 2.10 present the monitoring results for the ASBS 24 sites. The data tables do not include any QA/QC results. Both the original value and any QA/QC values, including field duplicates, are provided in Appendix A.

Table 2.07. Results for ASBS 24 UOs (<36")

Constituent	Units	7-343 MUG005 Event 1/8/2018	7-346 MUG013 Event 3/1/2018	7-347 MUG016 Event 1/8/2018	7-348 MUG028 Event 3/1/2018	7-350 MUG041 Event 3/21/2018	7-351 MUG046 Event 1/8/2018	7-352 MUG048 Event 1/8/2018	7-353 MUG049 Event 1/8/2018
Field Measurements									
pH	pH Units	6.94	6.8	7.43	7.49	7.05	8.31	7.24	6.81
Salinity	ppt	2.01	0.326	0.195	0.300	0.0839	0.442	0.271	0.334
Specific Conductivity	µS/cm	3920	707	417	616	191.3	929	577	715
Temperature	°C	16.7	16.4	15.7	16.6	14.4	17.5	17	17.4
Conventionals									
Total Suspended Solids	mg/L	144	300	216	143	278	1510	569	150
Oil & Grease	mg/L	2.7	10.9	2.8	5.31	1.9	9.9	8.7	2.4
Toxicity									
Urchin	P/F	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Fail
Seasonal Runoff Volume Estimate									
Runoff Volume	ft^3	13,880	8,143	7,218	7,958	12,955	22,764	12,770	14,422

Constituent	Units	7-354 MUG051 Event 1/8/2018	7-355 MUG053 Event 3/1/2018	7-356 MUG058 Event 3/21/2018	7-357 MUG059 Event 3/21/2018	7-358 MUG061 Event 3/21/2018	7-359 MUG066 Event 3/21/2018	7-360 MUG070 Event 3/1/2018	7-361 MUG073 Event 3/21/2018
Field Measurements									
pH	pH Units	6.64	7.8	6.98	6.62	6.88	6.63	7.93	6.21
Salinity	ppt	0.305	0.195	0.0277	0.0284	0.0146	0.0406	0.158	0.0406
Specific Conductivity	µS/cm	660	409	62.6	62.6	32.5	80.4	229	20.1
Temperature	°C	16.1	15.5	14.9	14.2	16.8	15.4	18	13.8
Conventionals									
Total Suspended Solids	mg/L	26.3	12.6	34.4	19.7	39.7	420	469	22.9
Oil & Grease	mg/L	1.5	1.17	1.55	1.85	ND	ND	34.7	ND
Toxicity									
Urchin	P/F	Fail	Fail	Fail	Fail	Pass	Pass	Fail	Pass
Seasonal Runoff Volume Estimate									
Runoff Volume	ft^3	44,083	48,395	9,557	22,235	7,217	33,787	19,617	12,873

Constituent	Units	7-362 MUG077 Event 3/21/2018	7-363 MUG078 Event 3/21/2018	7-364 MUG135 Event 3/21/2018	7-365 MUG147 Event 3/21/2018	7-366 MUG150 Event 3/2/2018	7-367 MUG187 Event 1/8/2018	7-370 MUG346 Event 3/21/2018	7-371 MUG355 Event 3/2/2018
Field Measurements									
pH	pH Units	7.40	6.18	9.49	6.53	7.71	6.05	7.06	8.76
Salinity	ppt	0.0225	0.0154	0.0251	0.0227	0.01	0.429	0.0216	0.0335
Specific Conductivity	µS/cm	53.3	45.2	37.2	46.2	22	898	42.3	74
Temperature	°C	14.4	13.7	14.7	14.4	16.7	16.7	14.1	18.3
Conventionals									
Total Suspended Solids	mg/L	2170	92.2	556	270	397	1140	133	351
Oil & Grease	mg/L	1.02	2.56	2.75	ND	3.32	13	5.34	1.68
Toxicity									
Urchin	P/F	Fail	Fail	Pass	Pass	Fail	Fail	Fail	Fail
Seasonal Runoff Volume Estimate									
Runoff Volume	ft^3	1,851	16,384	50,634	42,244	45,296	182,378	18,005	94,029

Constituent	Units	7-373 SAD0960 Event 3/1/2018	7-374 SAD0970 Event 3/21/2018	7-377 SAD1000 Event 3/21/2018	7-379 SAD1050 Event 3/21/2018	7-381 SAD1030 Event 3/21/2018	7-383 MUG318 Event 3/21/2018	7-384 ALT004 Event 1/8/2018	7-385 ALT005 Event 1/8/2018
Field Measurements									
pH	pH Units	8.18	8.66	7.6	6.98	7.30	8.1	7.9	6.15
Salinity	ppt	0.261	0.1379	0.238	0.0406	0.0266	0.723	0.966	0.769
Specific Conductivity	µS/cm	560	198.1	339	90.5	60.2	103.3	1944	1054
Temperature	°C	18	14.9	15.1	15.4	16.6	14.6	16.7	16.5
Conventionals									
Total Suspended Solids	mg/L	84.3	515	58.8	182	67.7	244	1660	1490
Oil & Grease	mg/L	1.41	ND	ND	ND	2.8	ND	6.8	4.5
Toxicity									
Urchin	P/F	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Fail
Seasonal Runoff Volume Estimate									
Runoff Volume	ft^3	62,424	56,969	38,591	103,312	60,270	32,969	7,179	20,486

Constituent	Units	7-386 ALT006 Event 1/8/2018	7-387 ALT007 Event 3/1/2018	7-388 ALT008 Event 3/1/2018	7-389 ALT009 Event 3/1/2018	7-390 ALT010 Event 3/21/2018	7-391 ALT011 Event 1/8/2018	7-393 ALT017 Event 1/8/2018	7-408 MUG014 Event 3/1/2018
Field Measurements									
pH	pH Units	6.52	6.98	7.8	7.3	6.28	6.5	7.75	6.4
Salinity	ppt	0.979	2.07	0.678	0.285	0.0178	0.111	0.159	0.166
Specific Conductivity	µS/cm	1980	2990	1373	598	36.8	243	339	367
Temperature	°C	16.7	17.6	15.8	16.2	15.5	16.5	15	16.2
Conventionals									
Total Suspended Solids	mg/L	172	18.8	223	196	15.6	373	143	58.2
Oil & Grease	mg/L	5.3	2.83	14	5.21	1.26	3.5	2.9	6.77
Toxicity									
Urchin	P/F	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Fail
Seasonal Runoff Volume Estimate									
Runoff Volume	ft^3	7,529	4,552	5,778	4,027	1,110	17,621	21,118	21,455

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to facilitate double-sided printing.

Table 2.08. Results for ASBS 24 UOs (>36")

Constituent	Units	7-368 MUG283 Event 1/8/2018	7-375 SAD0980 Event 3/21/2018	7-376 SAD0990 Event 3/21/2018	7-380 SAD1060 Event 3/21/2018
Field Measurements					
pH	pH Units	7.25	6.75	8.51	8.24
Salinity	ppt	0.102	0.0197	0.0205	0.11
Specific Conductivity	µS/cm	217	41.1	30.1	235
Temperature	°C	14.8	15.7	15.3	14.6
Conventionals					
Total Orthophosphate as P	mg/L	0.87	ND	0.117	0.454
Total Suspended Solids	mg/L	115	181	103	202
Oil & Grease	mg/L	3.4	1.5	ND	1.1
Ammonia as N	mg/L	1.07	0.314	0.0985	0.184
Nitrate as N	mg/L	1.18	0.215	0.136	0.827
Elements					
Arsenic, total	µg/L	0.63	0.42	0.483	0.924
Cadmium, total	µg/L	0.675	0.187	0.497	0.376
Chromium, total	µg/L	5.08	8.03	10.8	11.3
Copper, total	µg/L	25.6	8.6	7.8	19.6
Lead, total	µg/L	8.41	5.06	2.31	4.99
Mercury	µg/L	0.0194	0.0257	0.0115	0.0188
Nickel, total	µg/L	9.73	9.46	11.2	9.94
Selenium, total	µg/L	0.13	0.0264	0.0341	0.11
Silver, total	µg/L	ND	ND	ND	ND
Zinc, total	µg/L	75	25.1	24.9	76.7
Toxicity					
Urchin	P/F	Fail	Pass	Pass	Fail
Organophosphorus Pesticides					
Chlorpyrifos	ng/L	ND	ND	ND	ND

Constituent	Units	7-368 MUG283 Event 1/8/2018	7-375 SAD0980 Event 3/21/2018	7-376 SAD0990 Event 3/21/2018	7-380 SAD1060 Event 3/21/2018
Diazinon	ng/L	ND	ND	ND	ND
Polynuclear Aromatic Hydrocarbons					
Acenaphthene	ng/L	8.5	4.89	1.16	ND
Acenaphthylene	ng/L	ND	ND	ND	3.84
Anthracene	ng/L	11.7	ND	ND	8.83
Benz(a)anthracene	ng/L	10.2	ND	ND	26.9
Benzo(a)pyrene	ng/L	9.9	ND	9.89	8.53
Benzo(b)fluoranthene	ng/L	35.6	ND	6.23	37.2
Benzo(e)pyrene	ng/L	23.9	52.5	13.8	32.7
Benzo(g,h,i)perylene	ng/L	18.3	ND	ND	17.7
Benzo(k)fluoranthene	ng/L	16.4	ND	2.33	14.2
Biphenyl	ng/L	2.9	9.95	ND	1.43
Chrysene	ng/L	24.8	ND	31.8	61.3
Dibenz(a,h)anthracene	ng/L	ND	ND	ND	ND
Dibenzothiophene	ng/L	30.9	37.6	ND	ND
Dimethylnaphthalene, 2,6-	ng/L	ND	60.7	ND	ND
Fluoranthene	ng/L	77.6	13.5	8.76	57.6
Fluorene	ng/L	7.4	16.4	ND	2.25
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND	ND
Methylnaphthalene, 1-	ng/L	2.9	98.1	10.6	2.31
Methylnaphthalene, 2-	ng/L	2.3	115	11.8	4.03
Methylphenanthrene, 1-	ng/L	10.6	21.8	8.93	4.33
Naphthalene	ng/L	6.5	71.8	9.94	8.58
Perylene	ng/L	12	ND	9.76	8.53
Phenanthrene	ng/L	65.6	43.4	15.2	20.3

Constituent	Units	7-368 MUG283 Event 1/8/2018	7-375 SAD0980 Event 3/21/2018	7-376 SAD0990 Event 3/21/2018	7-380 SAD1060 Event 3/21/2018
Pyrene	ng/L	55.8	9.32	7.85	57.7
Trimethylnaphthalene, 2,3,5-	ng/L	ND	48.4	6.28	ND
Pyrethroid Pesticides					
Bifenthrin	ng/L	21.7	ND	ND	ND
Cyfluthrin	ng/L	ND	ND	ND	0.762
Cypermethrin, total	ng/L	ND	ND	ND	0.777
Deltamethrin/Tralomethrin, total	ng/L	ND	ND	ND	ND
Esfenvalerate	ng/L	ND	ND	ND	ND
Fenvalerate	ng/L	ND	ND	ND	ND
Fenpropathrin	ng/L	ND	ND	ND	ND
lamda-Cyhalothrin, total	ng/L	ND	ND	ND	ND
cis-Permethrin, total	ng/L	ND	ND	ND	ND
trans-Permethrin	ng/L	ND	ND	ND	ND
Seasonal Runoff Volume Estimate					
Runoff Volume	ft^3	26,344	59,038	49,559	59,213

Table 2.09. Results for ASBS Site 7-345 CO (MUG010)

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/21/2018
Field Measurements				
pH	pH Units	8.52	8.59	8.49
Salinity	ppt	0.0055	1.73	0.115
Specific Conductivity	µS/cm	11.22	3330	252
Temperature	°C	15	14.1	12.9
Conventionals				
Total Orthophosphate as P	mg/L	0.25	0.384	0.326
Total Suspended Solids	mg/L	58.6	41.8	29.4
Oil & Grease	mg/L	1.4	ND	1.28
Ammonia as N	mg/L	0.289	0.357	0.0883
Nitrate as N	mg/L	0.24	0.22	0.501
Elements				
Arsenic, total	µg/L	0.307	0.811	0.508
Cadmium, total	µg/L	1.47	0.231	0.296
Chromium, total	µg/L	3.51	2.93	2.63
Copper, total	µg/L	6.98	2.82	5.33
Lead, total	µg/L	3.71	1.24	2.69
Mercury	µg/L	0.0102	0.0038	0.0154
Nickel, total	µg/L	3.53	1.25	2.41
Selenium, total	µg/L	0.036	0.0113	0.0402
Silver, total	µg/L	ND	ND	ND
Zinc, total	µg/L	71.8	27.1	43.8
Toxicity				
Urchin	P/F	Fail	Fail	Pass
Organophosphorus Pesticides				
Chlorpyrifos	ng/L	ND	ND	ND
Diazinon	ng/L	ND	ND	ND

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/21/2018
Polynuclear Aromatic Hydrocarbons				
Acenaphthene	ng/L	3.6	ND	ND
Acenaphthylene	ng/L	12.7	ND	2.41
Anthracene	ng/L	11.8	1.34	ND
Benz(a)anthracene	ng/L	50.2	ND	ND
Benzo(a)pyrene	ng/L	95.3	ND	ND
Benzo(b)fluoranthene	ng/L	198	ND	ND
Benzo(e)pyrene	ng/L	157	6.1	14.2
Benzo(g,h,i)perylene	ng/L	172	ND	14.9
Benzo(k)fluoranthene	ng/L	85.4	ND	ND
Biphenyl	ng/L	7.2	1.46	ND
Chrysene	ng/L	136	ND	ND
Dibenz(a,h)anthracene	ng/L	43.7	ND	ND
Dibenzothiophene	ng/L	15.3	ND	ND
Dimethylnaphthalene, 2,6-	ng/L	3.7	ND	ND
Fluoranthene	ng/L	244	14.4	38.5
Fluorene	ng/L	6.1	ND	2.92
Indeno(1,2,3-c,d)pyrene	ng/L	235	ND	ND
Methylnaphthalene, 1-	ng/L	6	2.65	3.7
Methylnaphthalene, 2-	ng/L	9.5	3.77	5.82
Methylphenanthrene, 1-	ng/L	25.5	3.43	5.85
Naphthalene	ng/L	28.5	7.95	12.9
Perylene	ng/L	28.9	ND	ND
Phenanthrene	ng/L	109	8.98	15.5
Pyrene	ng/L	267	10.5	15.8
Trimethylnaphthalene, 2,3,5-	ng/L	ND	ND	ND

Constituent	Units	Event 1/9/2018	Event 3/2/2018	Event 3/21/2018
Pyrethroid Pesticides				
Bifenthrin	ng/L	4.4	ND	ND
Cyfluthrin	ng/L	ND	ND	ND
Cypermethrin, total	ng/L	28	ND	ND
Deltamethrin/Tralomethrin, total	ng/L	ND	ND	ND
Esfenvalerate	ng/L	ND	ND	ND
Fenvalerate	ng/L	ND	ND	ND
Fenpropathrin	ng/L	ND	2.41	ND
lamda-Cyhalothrin, total	ng/L	ND	ND	ND
cis-Permethrin, total	ng/L	ND	ND	ND
trans-Permethrin	ng/L	ND	ND	ND
Seasonal Runoff Volume Estimate				
Runoff Volume	ft^3	30,481		

Table 2.10. Results for ASBS Site 7-407 RW (MUG010RW)

		Event 1/8/2018		Event 3/1/2018		Event 3/21/2018	
Constituent	Units	Pre	Post	Pre	Post	Pre	Post
Field Measurements							
pH	pH Units	8.26	8.16	8.17	8.09	7.84	8.08
Salinity	ppt	32.5	33	37.2	36.6	36.8	36.3
Specific Conductivity	µS/cm	44600	44900	50700	49900	50200	49500
Temperature	°C	16.8	16.6	14.6	14.4	14.5	14.4
Conventionals							
Total Orthophosphate as P	mg/L	0.01	0.01	0.0215	0.0183	0.0409	0.0496
Total Suspended Solids	mg/L	33.3	9.6	6.65	16.3	16	11.7
Oil & Grease	mg/L	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.017	0.028	0.0279	0.0206	0.0299	0.0316
Nitrate as N	mg/L	0.03	0.01	0.0865	0.0294	0.144	0.134
Elements							
Arsenic, total	µg/L	1.42	1.21	1.5	1.5	1.62	1.45
Cadmium, total	µg/L	0.0198	0.0179	0.0511	0.0319	0.0466	0.0456
Chromium, total	µg/L	0.345	0.292	0.335	0.395	0.434	0.384
Copper, total	µg/L	0.203	0.72	0.13	0.123	0.138	0.123
Lead, total	µg/L	0.032	0.0267	0.0542	0.0135	0.0391	0.0342
Mercury	µg/L	0.00168	0.00156	ND	ND	ND	ND
Nickel, total	µg/L	0.277	0.218	0.242	0.275	0.379	0.393
Selenium, total	µg/L	0.007	0.007	0.00522	0.0156	0.0103	0.0135
Silver, total	µg/L	0.02	0.02	ND	ND	ND	ND
Zinc, total	µg/L	0.409	0.339	0.439	0.58	0.127	0.564
Toxicity							
Urchin	P/F	Pass	Pass	Pass	Pass	Pass	Pass
Kelp - Germination	P/F	Pass	Pass	Pass	Pass	Pass	Pass
Kelp - Growth	P/F	Pass	Pass	Pass	Pass	Pass	Pass
Mussel - Normal Development	P/F	Pass	Pass	Pass	Fail	Pass	Pass

Constituent	Units	Event 1/8/2018		Event 3/1/2018		Event 3/21/2018	
		Pre	Post	Pre	Post	Pre	Post
Organophosphorus Pesticides							
Chlorpyrifos	ng/L	ND	ND	ND	ND	ND	ND
Diazinon	ng/L	ND	ND	ND	ND	ND	ND
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND	ND	ND	ND
Acenaphthylene	ng/L	ND	ND	ND	ND	ND	ND
Anthracene	ng/L	ND	ND	ND	ND	ND	ND
Benz(a)anthracene	ng/L	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ng/L	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND	ND	ND	ND	ND
Benzo(e)pyrene	ng/L	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND	ND	ND	ND	ND
Biphenyl	ng/L	ND	ND	ND	ND	ND	ND
Chrysene	ng/L	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND	ND	ND	ND	ND
Dibenzothiophene	ng/L	ND	ND	ND	ND	ND	ND
Dimethylnaphthalene, 2,6-	ng/L	ND	ND	ND	ND	ND	ND
Fluoranthene	ng/L	ND	ND	ND	ND	ND	ND
Fluorene	ng/L	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND	ND	ND	ND
Methylnaphthalene, 1-	ng/L	ND	ND	ND	ND	ND	ND
Methylnaphthalene, 2-	ng/L	ND	ND	1.39	ND	ND	ND
Methylphenanthrene, 1-	ng/L	ND	ND	ND	ND	ND	ND
Naphthalene	ng/L	1.6	1.6	2.03	1.79	1.82	1.49
Perylene	ng/L	ND	ND	ND	ND	ND	ND

Constituent	Units	Event 1/8/2018		Event 3/1/2018		Event 3/21/2018	
		Pre	Post	Pre	Post	Pre	Post
Phenanthrene	ng/L	ND	ND	1.14	1.25	ND	1
Pyrene	ng/L	ND	ND	ND	ND	ND	ND
Trimethylnaphthalene, 2,3,5-	ng/L	ND	ND	ND	ND	ND	ND
Total PAHs	ng/L	1.6	1.6	4.56	3.04	1.82	2.49
Pyrethroid Pesticides							
Bifenthrin	ng/L	ND	ND	ND	ND	ND	ND
Cyfluthrin	ng/L	ND	ND	ND	ND	ND	ND
Cypermethrin, total	ng/L	ND	ND	ND	ND	ND	ND
Deltamethrin/Tralomethrin, total	ng/L	ND	ND	ND	ND	ND	ND
Esfenvalerate	ng/L	ND	ND	ND	ND	ND	ND
Fenvalerate	ng/L	ND	ND	ND	ND	ND	ND
Fenpropathrin	ng/L	ND	ND	ND	ND	ND	ND
lamda-Cyhalothrin, total	ng/L	ND	ND	ND	ND	ND	ND
cis-Permethrin, total	ng/L	ND	ND	ND	ND	ND	ND
trans-Permethrin	ng/L	ND	ND	ND	ND	ND	ND
Total PPs	ng/L	ND	ND	ND	ND	ND	ND

Table 2.01 - Table 2.10

Acronyms & Abbreviations:
CO = Coupled Outfall
ND = Non-Detect
ORW = Ocean Receiving Water Site
P/F = Pass/Fail
UO = Uncoupled Outfall

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2.3 COMPARISON TO NATURAL WATER QUALITY

The purpose of ASBS monitoring is to assess how water quality in receiving waters near ASBS discharges compare to natural water quality near reference drainage locations. The flowcharts in Figure 2.02a and Figure 2.02b provide the decision structure for assessing compliance which, in general, consists of comparisons between (1) the NWQ and Caltrans ORW values, and (2) pre-storm and during-storm ORW values.

The flowchart is applied to consecutive pairs of storm events. For example, if there are six storm events, exceedances are identified by assessing Storm Event #1 and Storm Event #2, then Storm Event #2 and Storm Event #3, etc., through Storm Event #5 and Storm Event #6—the flowchart is applied five times to six storm events. However, based on discussions between State Water Board staff and Caltrans staff, if a wet season only has a single storm event captured, the results of that storm event are not used to assess for compliance, i.e., to identify exceedances of NWQ.

Table 2.11 summarizes the NWQ values which are RMG area specific. The NWQ values for use by the So. CA RMG were calculated by the Southern California Coastal Water Research Project (SCCWRP).

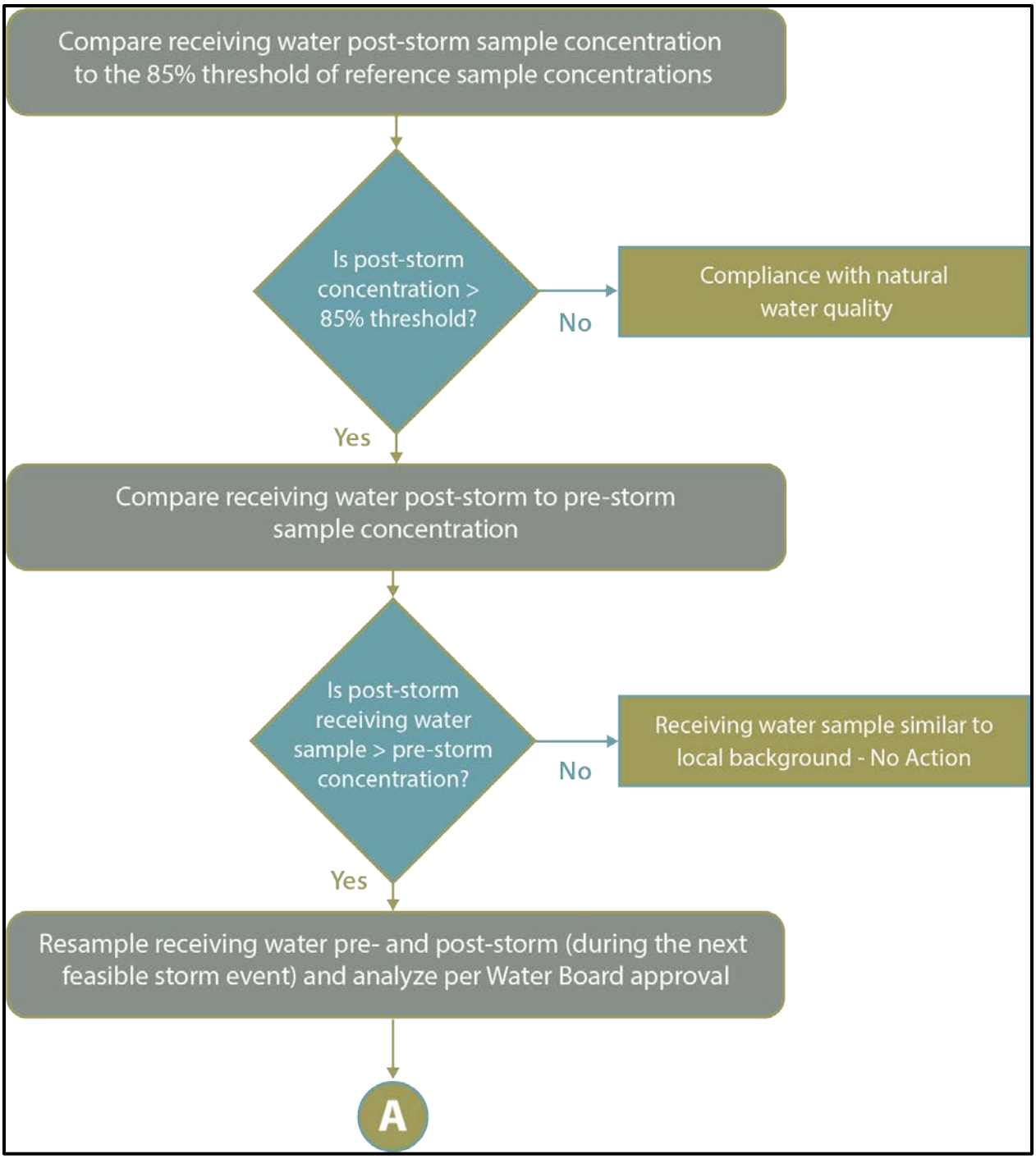
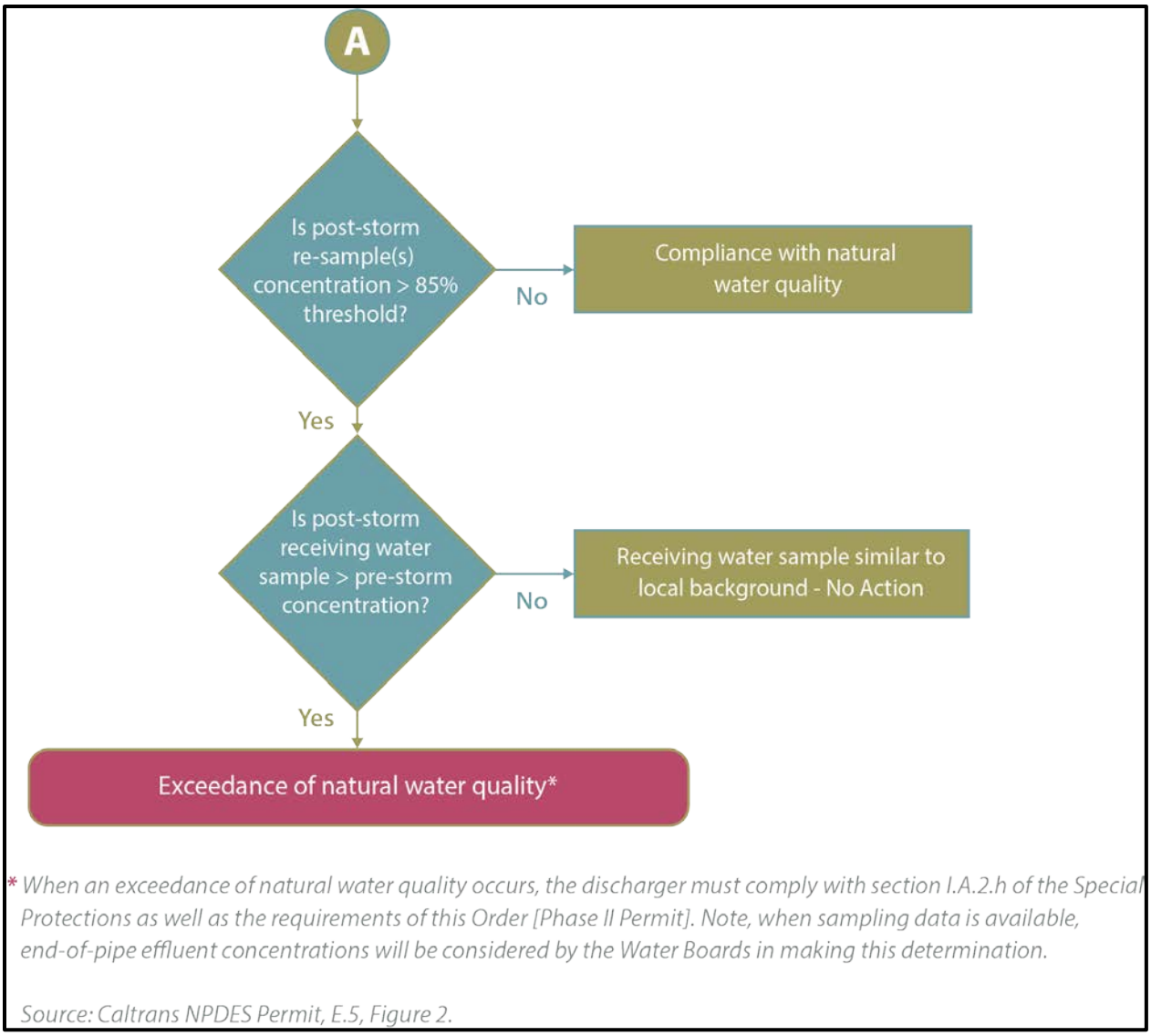


Figure 2.02a. ASBS Compliance Flowchart – Part 1



* *When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h of the Special Protections as well as the requirements of this Order [Phase II Permit]. Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.*

Source: Caltrans NPDES Permit, E.5, Figure 2.

Figure 2.02b. ASBS Compliance Flowchart – Part 2

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Table 2.11. ASBS Natural Water Quality Values1

Analyte	Southern California RMG[2,3]
General (mg/L)	
Ammonia as N	0.015
Nitrate as N	0.34
Oil & Grease	0.5
Total Ortho-Phosphate	0.10
Total Suspended Solids	48
Metals (µg/L)	
Arsenic	1.8
Cadmium	0.15
Chromium	1.9
Copper	1.5
Lead	0.5
Mercury	0.0006
Nickel	1.3
Selenium	0.003
Silver	0.08
Zinc	18.6
Organics (µg/L)	
Total Polynuclear Aromatic Hydrocarbons[4]	0.0125
Total Organophosphorus Pesticides	0.006
Total Pyrethroid Pesticides	0.00675

Notes:
1. Some values in this table have been rounded for reporting purposes.
2. Source: Table 6, Near-Coastal Water Quality at Reference Sites Following Storm Events (SCCWRP 2015).
3. The NWQ values are calculated with non-detects equal to one-half the method detection limit.
4. The Total PAHs NWQ value is based on the sum of the 25 PAHs listed in the report: *Near-Coastal Water Quality at Reference Sites Following Storm Events* (SCCWRP 2015).

Table 2.12 presents the cumulative data collected for ASBS 24 starting with the 2012–13 wet season through the current 2017–18 wet season for the ORW site and the NWQ values. Any results where an exceedance has been identified using the flowchart, i.e., Figure 2.02a and Figure 2.02b, are highlighted in yellow. Any results where the ORW Post Storm value is greater than the NWQ value and greater than the Pre Storm ORW value, but not an exceedance, are highlighted in green.

Because ASBS 24 was the only ASBS monitored during the 2017–18 wet season, that is the only cumulative data shown here. The cumulative results for all other ASBS are unchanged from the 2016–17 wet season and are reported in that MRR.

As previously mentioned, if a wet season only has a single storm event captured, the results of that storm event are not used to identify exceedances of NWQ. The ASBS Compliance Flowchart is applied to the following consecutive storm events:

ASBS 24, So. CA RMG Area.

- Event #2 (1/18/2017) & Event #3 (2/10/2017)
- Event #3 (2/10/2017) & Event #4 (2/16/2017)
- Event #5 (1/08/2018) & Event #6 (3/01/2018)
- Event #6 (3/01/2018) & Event #7 (3/21/2018)

Table 2.12. Comparison with Natural Water Quality Values – ASBS 24

ASBS 24, Laguna Point to Latigo Point

Ocean Receiving Water Site

			Event #1[2]		Event #2		Event #3		Event #4		Event #5		Event #6		Event #7	
			2/26/2014		1/18/2017		2/10/2017		2/16/2017		1/8/2018		3/1/2018		3/20/2018	
Constituent	Units	NWQ	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Total Orthophosphate as P	mg/L	0.1	0.03	0.11	0.005	0.005	0.005	0.005	0.02	0.05	0.01	0.01	0.0215	0.0183	0.0409	0.0496
Total Suspended Solids	mg/L	48	14.5	134	6.2	11	10.7	10.2	8.2	42.8	33.3	9.6	6.65	16.3	16	11.7
Oil & Grease	mg/L	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ammonia as N	mg/L	0.015	0.01	0.01	0.16	0.04	0.05	0.23	0.01	0.03	0.017	0.028	0.0279	0.0206	0.0299	0.0316
Nitrate as N	mg/L	0.34	0.03	0.01	0.005	0.005	0.005	0.1	0.01	0.04	0.03	0.01	0.0865	0.0294	0.144	0.134
Arsenic	µg/L	1.8	1.422	1.904	1.467	1.39	1.317	1.513	1.362	1.439	1.42	1.21	1.5	1.5	1.62	1.45
Cadmium	µg/L	0.15	0.1053	0.1473	0.0187	0.0228	0.0264	0.0222	0.0224	0.0825	0.0198	0.0179	0.0511	0.0319	0.0466	0.0456
Chromium	µg/L	1.9	1.2754	1.6479	0.3298	0.4574	0.2837	0.4529	0.4254	3.1823	0.345	0.292	0.335	0.395	0.434	0.384
Copper	µg/L	1.5	0.519	1.31	0.171	0.243	0.183	0.248	0.179	1.054	0.203	0.72	0.13	0.123	0.138	0.123
Lead	µg/L	0.5	0.1691	0.6973	0.0137	0.0608	0.0635	0.0935	0.0242	0.3779	0.032	0.0267	0.0542	0.0135	0.0391	0.0342
Mercury	µg/L	0.0006	0.0006	0.0006	0.00034	0.0005	0.0006	0.00056	0.0006	0.00166	0.00168	0.00156	0.0006	0.0006	0.0006	0.0006
Nickel	µg/L	1.3	0.8569	1.9577	0.264	0.3771	0.3416	0.4246	0.3677	2.2847	0.277	0.218	0.242	0.275	0.379	0.393
Selenium	µg/L	0.003	0.042	0.085	0.0025	0.0025	0.007	0.011	0.007	0.017	0.007	0.007	0.00522	0.0156	0.0103	0.0135
Silver	µg/L	0.08	0.07	0.08	0.01	0.01	0.01	0.01	0.03	0.03	0.02	0.02	0.005	0.005	0.005	0.005
Zinc	µg/L	18.6	1.7841	7.5549	0.6906	2.109	1.0525	10.2669	0.3985	24.7738	0.409	0.339	0.439	0.58	0.127	0.564
Toxicity - Urchin	P/F		P	P	P	P	P	P	P	P	P	P	P	P	P	P
Toxicity - Kelp - Germination	P/F		P	P	P	P	P	P	P	P	P	P	P	P	P	P
Toxicity - Kelp - Growth	P/F		P	P	P	P	P	P	P	P	P	P	P	P	P	P
Toxicity - Mussel	P/F		P	P	P	P	P	P	P	P	P	P	P	F	P	P
Total OPs	ng/L	6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total PAHs	ng/L	12.5	11.6	10.9	14.8	15.1	15	19.1	12.5	27.99	13.6	13.6	15.56	14.54	13.82	13.99
Total PPs	ng/L	6.75	7	7	6	3.65	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4

Notes:

1. Cells shaded in green indicate a single Post Storm ORW result that is greater than both the NWQ value and the Pre Storm ORW result. However, cells shaded in green do not indicate an exceedance of NWQ in accordance with the ASBS compliance flow chart (Figures 2.02a and 2.02b). Events shaded in yellow indicate a constituent that has exceeded a NWQ value in accordance with the ASBS compliance flow chart.

2. The ORW site moved within ASBS 24. Water quality data for Event #1 was captured at a different ORW site than the other events.

3. The Sampling and Analysis Plan (SAP) was updated for the 2014–15 wet season and finalized in March 2015. The updated SAP included a lower detection limit for mercury. This change was made because the method changed from EPA 1640 to EPA 1631e. Additionally, the detection limit for mercury was lowered from 0.005 µg/L to 0.0002 µg/L. The first storm event used Method 1640 for the analysis of mercury. The remaining storm events used Method 1631e for the analysis of mercury.

4. During the 2012–13 and 2013–14 wet seasons, 13 PAHs were analyzed as required by the Caltrans Permit. The SCCWRP Reference Water Quality Study (Report), released in February 2015, used 25 PAHs. After the Report was released, Caltrans started analyzing for 25 PAHs. The So. CA RMG used the Total PAHs value based on the 25 PAHs calculated in the SCCWRP Report. The first storm event captured during the 2013–14 wet season only analyzed for 13 PAHs. All remaining storm events captured were analyzed for 25 PAHs.

5. Non Detect values are set equal to one-half the method detection limit.

6. The NWQ value for Total OPs in ASBS 24 is 6 ng/L. This NWQ value is based on eight OPs. CT only monitored for two OPs.

7. No storms were successfully sampled during the 2014-15 and 2015-16 wet season as the CO did not discharge to the RW due to a sandberm. For the 2016-17 wet season new RW and CO sites were chosen.

Section 3
TMDL MONITORING

3.1 OVERVIEW

Caltrans is a named stakeholder in 84 TMDLs (State Water Board 2012). Caltrans conducts characterization monitoring and BMP effectiveness monitoring in these TMDL watersheds. For the 2017–18 wet season, the Caltrans TMDL Monitoring Program consisted of three projects:

1. District 11 Chollas Creek TMDL Monitoring Project

2. Tier 1 TMDL Monitoring Project

3. BMP Pilot Monitoring Project

In previous MRRs, the Tier 1 TMDL Monitoring Project was referred to as the NPDES Permit TMDL Monitoring Project.

3.1.1 Monitoring Sites

The three projects listed above consist of 48 monitoring sites, see Table 3.01.

Table 3.01. Number of TMDL Monitoring Sites by Project

Number of Sites[2,3]	TMDL Monitoring Project	Name Used in this Report
10	District 11 Chollas Creek TMDL Monitoring Project	Chollas Creek Project
28	Tier 1 TMDL Monitoring Project (Districts 1, 2, 3, 4, 5, 7, and 12)	Tier 1 Project
10	BMP Pilot Monitoring Project	BMP Pilot Project

Notes:

1. In previous MRRs, the Tier 1 TMDL Monitoring Project was referred to as the NPDES Permit TMDL Monitoring Project.
2. The Chollas Creek Project consists of 12 active monitoring sites, however, two of these sites are overflow/bypass sites that are monitored for flow only and so are not counted or discussed in this report.

3. The Tier 1 project consists of 30 active monitoring sites, however, two of these sites are overflow/bypass sites that are monitored for flow only and so are not counted or discussed in this report.

The 48 monitoring sites in these three projects are located in more than 21 TMDLs. A list of Chollas Creek Project sites is provided in Table 3.02. A list of Tier 1 Project sites is provided in Table 3.03. A list of BMP Pilot Monitoring Project sites is provided in Table 3.04. Table 3.02, Table 3.03, and Table 3.04 include site identification number, site name, Regional Water Board region number, and the latitude and longitude for each site. A map of the TMDL watersheds is presented in Figure 3.01.

Table 3.02. List of TMDL Monitoring Sites for Chollas Creek Project

Site ID Number	Site Name	BMP Type	Roadway Post Mile	Latitude[1] Longitude[1]	TMDL(s)[2]	TMDL Reach No.
11-350	SR94E/Bridge-INF	Modular Infiltration Trench	SR-94 3.34	32.718 -117.115	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	1
11-351	SR94E/Bridge-EFF	Modular Infiltration Trench	SR-94 3.34	32.718 -117.115	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	1
11-352	SR94E/Mass-INF	Bio-infiltration Swale	SR-94 8.27	32.744 -117.042	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	2
11-353	SR94E/Mass-EFF	Bio-infiltration Swale	SR-94 8.27	32.744 -117.042	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	2
11-355	RW-NF	None[3]	SR-94 3.34	32.718 -117.115	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	1
11-356	RW-SF	None[3]	SR-94 5.78	32.723 -117.076	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	2
11-357	94E/College INF	Bio-infiltration Swale Influent	SR-94 7.5	32.740 -117.052	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	2
11-358	94E/College EFF	Bio-infiltration Swale Effluent	SR-94 7.5	32.739 -117.053	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	2
11-359	94E/Median-ASF INF	Austin Sand Filter Influent	SR-94 3.0	32.717 -117.119	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	1
11-360	94E/Median-ASF EFF	Austin Sand Filter Effluent	SR-94 3.0	32.717 -117.118	Chollas Creek Diazinon TMDL Chollas Creek Dissolved Metals TMDL	1

Notes:

1. Latitude and longitude numbers have been rounded for reporting purposes.
2. TMDLs are within the San Diego Regional Water Quality Control Board area.
3. Receiving water site—not a characterization site or BMP effluent site.

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Table 3.03. List of TMDL Monitoring Sites for Tier 1 Project

Site ID Number	Site Name	BMP Type	Roadway Post Mile	Latitude[1] Longitude[1]	Regional Water Board	TMDL(s)	TMDL Reach No.
1-341	Weott North Humboldt	None[2]	US 101 37.334	40.3726 -123.9268	1	Lower Eel River Sediment & Temperature TMDL	1
1-342	Meyers Flat Humboldt	None[2]	US 101 27.673	40.26719 -123.86553	1	South Fork Eel River Temperature & Sediment TMDL	1
2-303	Shasta River Influent	Detention Basin	I-5 21.198	41.43129 -122.42818	1	Klamath River in California Temperature, Dissolved Oxygen, Nutrients and Microcystin TMDL	20
2-304	Shasta River Effluent	Detention Basin	I-5 21.198	41.43158 -122.42842	1	Klamath River in California Temperature, Dissolved Oxygen, Nutrients and Microcystin TMDL	20
2-305	Lost River	None[2]	SR-161 8.75	41.99679 -121.72385	1	Klamath River in California Temperature, Dissolved Oxygen, Nutrients and Microcystin TMDL Lost River Nitrogen Biochemical Oxygen Demand to address Dissolved Oxygen and pH Impairments TMDL	25 1
2-306	Mad River	None[2]	SR-36 2.751	40.44969 -123.50165	1	Mad River Sediment and Turbidity TMDL	5
3-397	I-5 SB at Cosumnes	None[1]	I-5 14.42	38.47324 -121.502	5	Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL	2
3-406	I-5 SB at Cosumnes - Effluent	Bioswale	I-5 15.5	38.47431 -121.50382	5	Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL	2
4-405	Antioch Influent	Biofiltration Basin	SR-4 26.78	38.00068 -121.824	2	Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL	1
4-406	Antioch Effluent	Biofiltration Basin	SR-4 26.78	38.00061 -121.824	2	Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL	1

Site ID Number	Site Name	BMP Type	Roadway Post Mile	Latitude[1] Longitude[1]	Regional Water Board	TMDL(s)	TMDL Reach No.
4-407	Marin SR-131	None[2]	SR-131 R1.558	37.8961 -122.4912	2	Richardson Bay Pathogens TMDL	1
4-412	4-Sol-12-0.945-INF	Bioswale	SR-12 0.945	38.20833 -122.1855	2	Napa River Sediment TMDL	1
4-413	4-Sol-12-0.945-EFF	Bioswale	SR-12 0.945	38.20833 -122.1855	2	Napa River Sediment TMDL	1
4-414	4-CC-4-23.9-INF	Bioswale	SR-4 23.9	38.01304 -121.87419	2 & 5	Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL	1
4-415	4-CC-4-23.9-EFF	Bioswale	SR-4 23.9	38.01304 -121.87419	2 & 5	Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL	1
4-428	Biofiltration Basin Influent	Biofiltration Basin	I-80 12.663	38.21606 -122.13915	2	San Francisco Bay Mercury TMDL San Francisco Bay PCBs TMDL	5
4-429	Biofiltration Basin Effluent	Biofiltration Basin	I-80 12.663	38.21606 -122.13915	2	San Francisco Bay Mercury TMDL San Francisco Bay PCBs TMDL	5
5-306	Santa Cruz HWY 1/17 IC	None[2]	SR-1 17.197	36.98604 -122.0234	3	San Lorenzo River (includes Carbonera, Lompico, and Shingle Mills Creeks) Sediment TMDL	1
5-307	Santa Cruz SB HWY 1 Influent	Bioswale	SR-1 16.6	36.98856 -122.01672	3	San Lorenzo River (includes Carbonera, Lompico, and Shingle Mills Creeks) Sediment TMDL	1
5-308	Santa Cruz SB HWY 1 Effluent	Bioswale	SR-1 16.6	36.98856 -122.01672	3	San Lorenzo River (includes Carbonera, Lompico, and Shingle Mills Creeks) Sediment TMDL	1
7-08	North Hollywood CSF Inlet	CSF	US-101 11.1	34.1486 -118.3729	4	Los Angeles River Trash TMDL Los Angeles River Watershed Bacteria TMDL Los Angeles River Watershed Metals TMDL	14 5 4

Site ID Number	Site Name	BMP Type	Roadway Post Mile	Latitude[1] Longitude[1]	Regional Water Board	TMDL(s)	TMDL Reach No.
7-09	North Hollywood CSF Inlet	CSF	US-101 11.1	34.1486 -118.3729	4	Los Angeles River Trash TMDL Los Angeles River Watershed Bacteria TMDL Los Angeles River Watershed Metals TMDL	14 5 4
12-254	1137L Inlet	Detention Basin with Overflow Operation	SR-73 ORA-073-23.51	33.63824 -117.85778	8	San Diego Creek Watershed, Organochlorine Compounds and PCBs TMDL	1
12-255	1137L Outlet	Detention Basin with Overflow Operation	SR-73 ORA-073-23.51	33.6382 -117.85773	8	San Diego Creek Watershed, Organochlorine Compounds and PCBs TMDL	1
12-257	1143L Inlet	Detention Basin with Overflow Operation	SR-73 ORA-073-23.60	33.63921 -117.85856	8	San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) / Cadmium TMDL	1
12-258	1143L Outlet	Detention Basin with Overflow Operation	SR-73 ORA-073-23.60	33.63926 -117.85853	8	San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) / Cadmium TMDL	1
12-329	1049L Inlet	Bioretention Basin	SR-73 23.6	33.64088 -117.86168	8	San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) TMDL	3
12-330	1049L Outlet	Bioretention Basin	SR-73 23.6	33.63995 -117.86143	8	San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) TMDL	3

1. Latitude and longitude numbers have been rounded for reporting purposes.
2. TMDL characterization site.

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Table 3.04. List of Monitoring Sites for BMP Pilot Project

Site ID Number	Site Name	BMP Type	Roadway Post Mile	Latitude[1] Longitude[1]	Regional Water Board
3-213	EOP Station	Influent	I-5 North 13.1	38.443, -121.491	5
3-390	BMP1 Effluent	Linear Filtration Trench	I-5 North 13.1	38.441, -121.490	5
3-393	BMP3 Effluent	Media Filter Drain	I-5 North 13.1	38.442, -121.490	5
3-394	BMP4 Effluent	Bioretention Trench	I-5 North 13.1	38.442, -121.490	5
3-395	BMP5 Effluent	Linear Sand Filter	I-5 North 13.1	38.443, -121.490	5
7-394[2]	Media Filter Drain (Effluent)	Media Filter Drain	I-210-EB	34.296, -118.416	4
7-395[2]	EOP - Influent	Influent	I-210-EB	34.295, -118.416	4
7-396[2]	Linear Sand Filter 5A (Effluent)	Linear Sand Filter	I-210-EB	34.295, -118.416	4
7-397[2]	Linear Filtration Trench (Effluent)	Linear Filtration Trench	I-210-EB	34.295, -118.415	4
7-398[2]	Linear Sand Filter 5 (Effluent)	Linear Sand Filter	I-210-EB	34.295, -118.415	4

1. Latitude and longitude numbers have been rounded for reporting purposes.
2. No storm events were sampled at the District 7 BMP Pilot Project sites. The sites had to be maintained to address clogging issues. No qualifying storm events occurred after the repair work was completed in March 2018.

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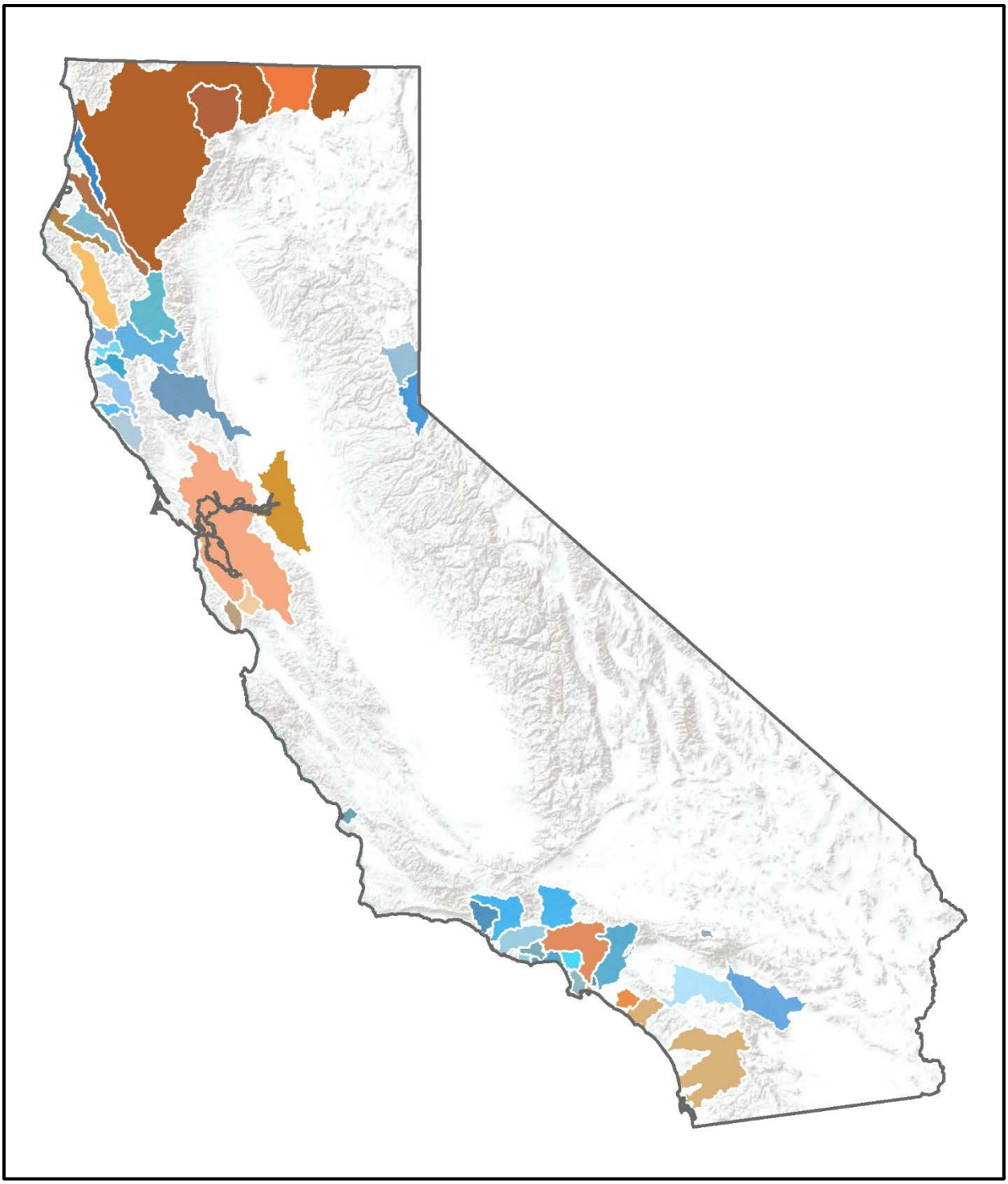

Figure 3.01. TMDL Watersheds with Caltrans Monitoring Sites

Notes:

1. Blue shading indicates a TMDL watershed where Caltrans has been assigned a WLA.
2. Orange shading indicates a TMDL watershed where Caltrans has been assigned a WLA and had an active monitoring site for the 2017–18 wet season. A watershed may have more than one TMDL.

3.1.2 Monitoring Approach

The sample collection practices for the two TMDL monitoring projects are provided below:

Chollas Creek Project. Water quality samples are collected via a combination of flow-weighted composites and grab samples. Grab samples are only used to collect microbiological and oil and grease samples.

Tier 1 Project. In general, two different strategies are used to collect water quality samples. The strategy depends on whether the water quality samples were collected from a BMP effectiveness site or a characterization site:

1. *BMP Effectiveness Sites*. Automated, flow-weighted composite samples are collected at both the influent to the BMP and the effluent from the BMP for the entire event, or up to a maximum of 36 hours (unless, under certain circumstances, as directed by the Caltrans Task Order Manager). Microbiological and oil and grease samples are collected via a grab sample.

2. *Characterization Site*. Sample aliquots are collected manually (i.e., grab samples) for a 3-hour period during a storm event. Flow measurements are estimated each time a sample aliquot is taken and used to flow-weight the final composite sample.

BMP Pilot Project. Water quality samples are collected via a combination of flow-weighted composites and grab samples. Grab samples are only used to collect microbiological and oil and grease samples.

3.1.3 Monitoring Projects on Hold

Two TMDL monitoring projects were on hold for the 2017–18 wet season:

1. District 8 Coachella Valley TMDL Monitoring Project

2. Rainbow Creek TMDL Monitoring Project

These two TMDL monitoring projects are discussed below.

District 8 Coachella Valley TMDL Monitoring Project. After 2 years of monitoring that concluded at the start of the 2015–16 wet season, Caltrans submitted its required monitoring report to the Colorado River Basin Water Board in November 2015. The monitoring report concludes that it is highly unlikely that Caltrans facilities represented by the monitoring sites have been responsible for contribution of bacteria to the Coachella Valley Stormwater Channel due to not enough runoff reaching the channel.

At the time the monitoring report was submitted, Caltrans requested from the Colorado River Basin Regional Water Board to be removed from the TMDL due to lack of connectivity. The Colorado River Basin Regional Water Board responded on January 6, 2016, indicating that it was too early to determine exclusion of any groups/individuals from the responsible party list. When asked for an update on this monitoring project the Colorado River Basin Regional Water Board responded on May 31, 2018: "The TMDL Program hasn't made any decision on phase 2 implementation of this TMDL because we are still analyzing the data and information from phase 1 implementation to find the sources of impairments." No further work is anticipated at this time until the Colorado River Basin Regional Water Board makes a determination of exclusion. The Phase I monitoring effort is complete. Caltrans is waiting for direction from the Colorado River Basin Regional Water Board on the next phase of the TMDL.

Rainbow Creek TMDL Monitoring Project. After 4 years of monitoring, Caltrans submitted a letter with a document that summarized the monitoring activities to the San Diego Basin Regional Water Board in February 2017. The document concludes that its runoff did not meet the 2013 and 2017 Nitrogen WLAs and is slightly in excess of the 2021 Nitrogen WLA. Caltrans runoff did not meet the 2013 Phosphorus WLA, but Caltrans runoff is well below the 2017 and 2021 Phosphorus WLA. The difference between the Caltrans result and the WLA are within normal limits of data variability and there is no consistent trend in the data. A comparison of Caltrans runoff concentrations with the upstream and downstream receiving water locations indicate that it is unlikely Caltrans discharges are providing significant nutrient contributions to Rainbow Creek.

The Caltrans drainage area contains no known sources of nutrients, makes up approximately 2 percent of the total watershed, and is bordered by commercial growers, nurseries and orchards—operations that take up 21 percent of the watershed. Soil tests have shown that the installation of an infiltration-type BMP is not practical. Caltrans has requested that the San

Diego Basin Regional Water Board adjust the permitting language accordingly based on the monitoring report conclusions. The San Diego Basin Regional Water Board responded to Caltrans indicating that it supports a reduction in monitoring frequency to once per permit term, see letter in Appendix E, Communications with the State Water Board and Regional Water Boards. The letter stipulates that the next reporting period for Caltrans is October 1, 2020, to September 30, 2021.

Tier 1 TMDL Monitoring Project. The State Water Board communicated via email dated August 17, 2018, a list of 12 watersheds listed below where monitoring can be terminated.

- Richardson Bay
- Napa River
- Sonoma Creek
- San Pedro and Pacifica State Beach
- San Francisco Bay (TMDL Pollutant – PCBs)
- San Francisco Bay (TMDL Pollutant – Mercury)
- San Francisco Bay Urban Creeks
- Santa Clara River Reach
- Upper Santa Clara River
- Clear Lake
- Cache Creek, Bear Creek, Sulphur Creek and Harley Gulch
- Lake Elsinore and Canyon Lake Nutrients

3.2 RESULTS

The TMDL monitoring results are presented in data tables. The list of constituents varies from site to site, depending on the applicable TMDL. Results from QA/QC samples (e.g., field blanks, field duplicates) are not included in these tables. Results for field duplicates are used for QA/QC purposes only—the results of the original sample and field duplicate sample are not averaged together. All water quality data, including QA/QC sample results, are provided in Appendix A. Each data table contains applicable TMDL limits, California Toxics Rule (CTR) values, and water quality control plan (Basin Plan) values.

Water quality results are directly compared to TMDLs with concentration-based WLAs and not compared to TMDLs with mass-based WLAs. The water quality results are not directly compared to CTR values and water quality objectives in basin plans because these are not directly applicable to stormwater discharges. These values are included in this report as reference values for informational purposes.

3.2.1 Storm Event Summary

The number of storm events forecasted, false starts, and successfully captured for the TMDL sites are presented in Table 3.05 and Table 3.06. The number of storm events forecasted, false starts, and successfully captured for the BMP Pilot Project are presented in Table 3.07. The cumulative number of storm events captured over the past wet seasons are presented in Table 3.08, Table 3.09, and Table 3.10.

Table 3.05. 2017–18 Storm Event Sampling Summary for Chollas Creek Project

Site ID	Number of Forecasted Events[1]	Number of Non-mobilized Storm Events[2,3]	Number of False Start Storm Events[2,4]	Number of Successfully Captured Storm Events[2,5]
11-350	13	10	1	2
11-351[6]	13	10	1	2
11-352	13	10	1	2
11-353[7]	13	10	1	2
11-355	13	10	1	2
11-356	13	10	1	2
11-357[8]	13	10	1	1
11-358[8]	13	10	1	1
11-359	13	10	1	2
11-360	13	10	1	2

Notes:

1. Forecasted storm events met or exceeded 0.5-inch precipitation with a probability of 75 percent or greater.
2. Number of Non-mobilized Storm Events + Number of False Start Storm Events + Number of Successfully Captured Storm Events = Number of Forecasted Events.
3. A non-mobilized storm event occurs when a forecasted storm event fails to meet the mobilization criteria at the point in time when a “Go” or “No-Go” decision needs to be made.
4. A false start is a storm event that met the criteria for mobilization, but samples were not collected due to insufficient runoff or equipment issues.
5. A successfully captured storm event is a storm event that met the criteria and samples were sent to the laboratory for analysis.
6. No measurable flows occurred at modular infiltration BMP effluent station 11-351 during both monitoring events because the BMP fully retained/treated runoff volume. However, the paired inlet station, 11-350, was successfully sampled and submitted for analysis and are therefore considered successful events.
7. No measurable flows occurred at Bio-infiltration Swale BMP effluent station 11-353 during the second monitoring event because the BMP fully retained/treated runoff volume. However, the paired inlet station, 11-352, was successfully sampled and submitted for analysis and is therefore considered a successful event.
8. Sites 11-357 and 11-358 not sampled during 1/8/18 event (first event) due to ongoing construction at the location.

Table 3.06. 2017–18 Storm Event Sampling Summary for Tier 1 Project

Site ID	Number of Forecasted Events	Number of Non-mobilized Storm Events[1, 4]	Number of False Start Storm Events[2, 4]	Number of Successfully Captured Storm Events[3, 4]
1-341	8	5	0	3
1-342	21	17	1	3
2-303	6	2	2	2
2-304	6	2	2	2
2-305[5]	6	4	2	0
2-306	5	0	2	3
3-397	6	2	0	4
3-406	6	2	0	4
4-405	21	18	1	2
4-406	21	18	1	2
4-407	22	19	1	2
4-412	18	15	0	3
4-413	18	15	0	3
4-414	20	17	0	3
4-415	20	17	0	3
4-428	12	7	0	5
4-429	12	7	0	5
5-306	20	17	0	3
5-307	20	16	1	3
5-308	20	16	1	3
7-08	7	4	0	3
7-09	7	4	0	3
12-254	7	4	0	3
12-255	7	4	0	3
12-257	7	4	0	3
12-258	7	4	0	3
12-329	7	4	0	3
12-330	7	4	0	3

Notes:

1. A non-mobilized storm event occurs when either: (1) a forecasted storm event fails to meet the mobilization criteria at the point in time when a “Go” or “No-Go” decision needs to be made, or (2) installation of monitoring equipment has not yet occurred at a monitoring site.
2. A false start is a storm event that met the criteria for mobilization, but samples were not collected due to insufficient runoff or equipment issues.
3. A successfully captured storm event is a storm event that met the criteria and samples were sent to the laboratory for analysis.
4. Number of Non-mobilized Storm Events + Number of False Start Storm Events + Number of Successfully Captured Storm Events = Number of Forecasted Events.
5. Site 2-305 had no successful storms captured this season from the monitoring consultant, "This site is very difficult due to its highly arid, and very remote, location. No samples were obtained due to strong rain shadow affects and the general lack of rain in sufficient quantities to produce runoff."

Table 3.07. 2017–18 Storm Event Sampling Summary for BMP Pilot Project

Site ID	Number of Forecasted Events[1]	Number of Non-mobilized Storm Events[2,3]	Number of False Start Storm Events[2,4]	Number of Successfully Captured Storm Events[2,3]
3-213	5	0	0	5
3-390	5	0	0	5
3-393	5	0	0	5
3-394	5	0	0	5
3-395	5	0	0	5
7-394[5]	0	0	0	0
7-395[5]	0	0	0	0
7-396[5]	0	0	0	0
7-397[5]	0	0	0	0
7-398[5]	0	0	0	0

Notes:

1. A non-mobilized storm event occurs when either: (1) a forecasted storm event fails to meet the mobilization criteria at the point in time when a “Go” or “No-Go” decision needs to be made, or (2) installation of monitoring equipment has not yet occurred at a monitoring site.
2. A false start is a storm event that met the criteria for mobilization, but samples were not collected due to insufficient runoff or equipment issues.
3. A successfully captured storm event is a storm event that met the criteria and samples were sent to the laboratory for analysis.
4. Number of Non-mobilized Storm Events + Number of False Start Storm Events + Number of Successfully Captured Storm Events = Number of Forecasted Events.

5. No storm events were sampled at the District 7 BMP Pilot Project sites. The sites had to be maintained to address clogging issues. No qualifying storm events occurred after the repair work was completed in March 2018.

Table 3.08. Cumulative Number of Storm Events Captured at Chollas Creek Sites

Station ID	2017–18 Number of Successfully Captured Storm Events	Cumulative Number of Successfully Captured Storm Events	Target Number of Storm Events[1]
11-350	2	6	6
11-351[2]	2	6	6
11-352	2	6	6
11-353	2	6	6
11-355	2	6	6
11-356	2	6	6
11-357	1	1	3
11-358	1	1	3
11-359	2	2	3
11-360	2	2	3

Notes:

1. Target Number of Storm Events. This column is based on three storm events per wet season.
2. No measurable flows occurred at modular infiltration BMP effluent station 11-351 during both monitoring events because the BMP fully retained/treated runoff volume. However, the paired inlet station, 11-350, was successfully sampled and submitted for analysis and are therefore considered successful events.

Table 3.09. Cumulative Number of Storm Events Captured at Tier 1 Project Sites

Station ID	2017–18 Number of Successfully Captured Storm Events	Cumulative Number of Successfully Captured Storm Events[1]	Target Number of Storm Events[2]
1-341	3	6	6
1-342	3	6	6
2-303	2	5	6
2-304	2	5	6
2-305	0	1	6
2-306	3	6	6
3-397	4	10	9
3-406	4	4	3
4-405	2	5	6
4-406	2	5	6
4-407	2	4	6
4-412	3	6	6
4-413	3	6	6
4-414	3	5	6
4-415	3	5	6
4-428	5	5	3
4-429	5	5	3
5-306	3	6	6
5-307	3	6	6
5-308	3	5	6
7-08	3	12	15
7-09	3	12	15
12-254	3	3	3
12-255	3	3	3
12-257	3	3	3
12-258	3	3	3
12-329	3	14	15
12-330	3	14	15

Notes:

1. Cumulative Number of Successfully Captured Storm Events. This column only includes storm events captured during the current Permit term.
2. Target Number of Storm Events. This column is based on three storm events per wet season.

Table 3.10. Cumulative Number of Storm Events Captured at BMP Pilot Project Sites

Station ID	2017–18 Number of Successfully Captured Storm Events	Cumulative Number of Successfully Captured Storm Events
3-213	5	17
3-390	5	17
3-393	5	17
3-394	5	12
3-395	5	17
7-394[1]	0	13
7-395[1]	0	13
7-396[1]	0	13
7-397[1]	0	13
7-398[1]	0	13

Notes:

1. No storm events were sampled at the District 7 BMP Pilot Project sites. The sites had to be maintained to address clogging issues. No qualifying storm events occurred after the repair work was completed in March 2018.

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3.2.2 Chollas Creek Project Sites

Table 3.11 presents a summary of the storm event sampling conducted at the Chollas Creek Project sites during the 2017–18 wet season.

Table 3.11. Chollas Creek Project Sites

Site ID	Site Name	Event 1/8/2018	Event 2/27/2018
11-350	SR94E/Bridge-INF	✓	✓
11-351[2]	SR94E/Bridge-EFF	✓	✓
11-352	SR94E/Mass-INF	✓	✓
11-353	SR94E/Mass-EFF	✓	✓
11-355	RW-NF[1]	✓	✓
11-356	RW-SF[1]	✓	✓
11-357	94E/College INF		✓
11-358	94E/College EFF		✓
11-359	94E/Median-ASF INF	✓	✓
11-360	94E/Median-ASF EFF	✓	✓

Notes:

1. Receiving water site.
2. No measurable flows occurred at modular infiltration BMP effluent station 11-351 during both monitoring events because the BMP fully retained/treated runoff volume. However, the paired inlet station, 11-350, was successfully sampled and submitted for analysis and are therefore considered successful events.

Table 3.12 through Table 3.20 present the monitoring results for the Chollas Creek Project sites. Any results in these data tables greater than the corresponding TMDL water quality objective values are highlighted in red. For the 2014–15 MRR, if a field duplicate was collected for a storm event, the results presented in the data tables were the average of the original sample and duplicate sample. For the 2015–16, 2016–17, and 2017–18 MRRs, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix A.

Table 3.12. Results for Chollas Creek TMDL Site 11-350 (SR94E/Bridge-INF)

Modular Infiltration Trench Influent, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018
TMDL-Specific Constituents			
Diazinon	ng/L	ND	ND
Copper, dissolved	µg/L	15	14
Lead, dissolved	µg/L	0.5	0.7
Zinc, dissolved	µg/L	120	50
Field Measurements			
pH	pH units	7.91	7.27
Temperature	°C	15.4	13.1
Specific Conductivity	µS/cm	126.5	97
Average Flow Rate	gpm	11.64	9.1
Bacteria			
Fecal Coliform	MPN/100mL	5400	5400
Conventionals			
Hardness as $CaCO_3$	mg/L	26	19
Nitrate as N	mg/L	0.32	0.29
Oil & Grease	mg/L	3	3
Total Dissolved Solids	mg/L	36	36
Total Kjeldahl Nitrogen	mg/L	1.08	0.64
Total Phosphorus	mg/L	0.1	0.07
Total Suspended Solids	mg/L	73	9
Total Organic Carbon	mg/L	10.4	8.75
Dissolved Organic Carbon	mg/L	9.54	8.19
Elements			
Aluminum, total	µg/L	1600	1300
Chromium, total	µg/L	4.6	1.9
Copper, total	µg/L	49	20
Iron, total	µg/L	1800	490

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018
Lead, total	µg/L	31	6.5
Zinc, total	µg/L	140	54
Toxicity			
Chronic Toxicity, Biomass	P/F	PASS	PASS
Chronic Toxicity, Survival	P/F	PASS	PASS
Polynuclear Aromatic Hydrocarbons			
Acenaphthene	ng/L	ND	ND
Acenaphthylene	ng/L	ND	ND
Anthracene	ng/L	ND	ND
Benz(a)anthracene	ng/L	ND	ND
Benzo(a)pyrene	ng/L	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND
Chrysene	ng/L	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND
Fluoranthene	ng/L	ND	ND
Fluorene	ng/L	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND
Naphthalene	ng/L	ND	ND
Phenanthrene	ng/L	ND	ND
Pyrene	ng/L	ND	ND
Total PAHs	ng/L	ND	ND

Table 3.13. Results for Chollas Creek TMDL Site 11-352 (SR94E/Mass-INF)

Bio-infiltration Swale Influent, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018
TMDL-Specific Constituents			
Diazinon	ng/L	ND	ND
Copper, dissolved	µg/L	25	13
Lead, dissolved	µg/L	1.3	1.4
Zinc, dissolved	µg/L	160	120
Field Measurements			
pH	pH units	7.76	7.73
Temperature	°C	15.1	12.7
Specific Conductivity	µS/cm	215.1	141
Average Flow Rate	gpm	48.6	4.8
Bacteria			
Fecal Coliform	MPN/100mL	35000	3400
Conventionals			
Hardness as $CaCO_3$	mg/L	55	30
Nitrate as N	mg/L	0.78	0.53
Oil & Grease	mg/L	3	5
Total Dissolved Solids	mg/L	108	52
Total Kjeldahl Nitrogen	mg/L	3.96	1.06
Total Phosphorus	mg/L	0.32	0.12
Total Suspended Solids	mg/L	81	18
Total Organic Carbon	mg/L	28.8	16.7
Dissolved Organic Carbon	mg/L	27.3	15
Elements			
Aluminum, total	µg/L	1600	2500
Chromium, total	µg/L	4	2.1
Copper, total	µg/L	48	22
Iron, total	µg/L	1600	850

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018
Lead, total	µg/L	28	7.8
Zinc, total	µg/L	310	170
Toxicity			
Chronic Toxicity, Biomass	P/F	PASS	PASS
Chronic Toxicity, Survival	P/F	PASS	PASS
Polynuclear Aromatic Hydrocarbons			
Acenaphthene	ng/L	ND	ND
Acenaphthylene	ng/L	ND	ND
Anthracene	ng/L	ND	ND
Benz(a)anthracene	ng/L	ND	ND
Benzo(a)pyrene	ng/L	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND
Chrysene	ng/L	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND
Fluoranthene	ng/L	ND	ND
Fluorene	ng/L	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND
Naphthalene	ng/L	ND	ND
Phenanthrene	ng/L	ND	ND
Pyrene	ng/L	ND	ND
Total PAHs	ng/L	ND	ND

Table 3.14. Results for Chollas Creek TMDL Site 11-353 (SR94E/Mass-EFF)

Bio-infiltration Swale Effluent, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 1/8/2018	TMDL Limits[1,2,3] 1/8/2018	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
TMDL-Specific Constituents					
Diazinon	ng/L	ND	72		72
Copper, dissolved	µg/L	4.4	170	12	12
Lead, dissolved	µg/L	ND	129	58	58
Zinc, dissolved	µg/L	10	338	108	108
Field Measurements					
pH	pH units	6			6.5 to 8.5
Temperature	°C	14.4			
Specific Conductivity	µS/cm	815			
Average Flow Rate	gpm	1.8			
Bacteria					
Fecal Coliform	MPN/100mL	1600			
Conventionals					
Hardness as $CaCO_3$	mg/L	120			
Nitrate as N	mg/L	0.68			
Oil & Grease	mg/L	ND			
Total Dissolved Solids	mg/L	380			
Total Kjeldahl Nitrogen	mg/L	1.49			
Total Phosphorus	mg/L	0.47			
Total Suspended Solids	mg/L	8			
Total Organic Carbon	mg/L	36.6			
Dissolved Organic Carbon	mg/L	36.4			
Elements					
Aluminum, total	µg/L	130			
Chromium, total	µg/L	1.9			
Copper, total	µg/L	5.8		13	
Iron, total	µg/L	220			

Constituent[1]	Units	Event 1/8/2018	TMDL Limits[1,2,3] 1/8/2018	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
Lead, total	µg/L	0.5		72	
Zinc, total	µg/L	15		110	
Toxicity					
Chronic Toxicity, Biomass	P/F	PASS			
Chronic Toxicity, Survival	P/F	PASS			
Polynuclear Aromatic Hydrocarbons					
Acenaphthene	ng/L	ND			
Acenaphthylene	ng/L	ND			
Anthracene	ng/L	ND			
Benz(a)anthracene	ng/L	ND			
Benzo(a)pyrene	ng/L	ND			
Benzo(b)fluoranthene	ng/L	ND			
Benzo(g,h,i)perylene	ng/L	ND			
Benzo(k)fluoranthene	ng/L	ND			
Chrysene	ng/L	ND			
Dibenz(a,h)anthracene	ng/L	ND			
Fluoranthene	ng/L	ND			
Fluorene	ng/L	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND			
Naphthalene	ng/L	ND			
Phenanthrene	ng/L	ND			
Pyrene	ng/L	ND			
Total PAHs	ng/L	ND			

Table 3.15. Results for Chollas Creek TMDL Site 11-355 (RW-NF)

Receiving Water, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018	TMDL Limits	Reference Values CTR Values[5]	Reference Values Basin Plan Values
Field Measurements						
pH	pH units	7.67	6.97			
Temperature	°C	15.7	12.1			
Specific Conductivity	µS/cm	358.4	105			
Conventionals						
Hardness as $CaCO_3$	mg/L	97	38			

Table 3.16. Results for Chollas Creek TMDL Site 11-356 (RW-SF)

Receiving Water, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018	TMDL Limits	Reference Values CTR Values[5]	Reference Values Basin Plan Values
Field Measurements						
pH	pH units	7.28	7.7			
Temperature	°C	13.9	12.1			
Specific Conductivity	µS/cm	590	316			
Conventionals						
Hardness as $CaCO_3$	mg/L	210	72			

Table 3.17. Results for Chollas Creek TMDL Site 11-357 (SR94E/College INF)

Bio-infiltration Swale Influent, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 2/27/2018
TMDL-Specific Constituents		
Diazinon	ng/L	ND
Copper, dissolved	µg/L	10
Lead, dissolved	µg/L	8.4
Zinc, dissolved	µg/L	19
Field Measurements		
pH	pH units	8.39
Temperature	°C	11.6
Specific Conductivity	µS/cm	106
Average Flow Rate	gpm	9.9
Bacteria		
Fecal Coliform	MPN/100mL	48
Conventionals		
Hardness as $CaCO_3$	mg/L	45
Nitrate as N	mg/L	0.73
Oil & Grease	mg/L	6
Total Dissolved Solids	mg/L	68
Total Kjeldahl Nitrogen	mg/L	0.91
Total Phosphorus	mg/L	0.11
Total Suspended Solids	mg/L	40
Total Organic Carbon	mg/L	17
Dissolved Organic Carbon	mg/L	15.6
Elements		
Aluminum, total	µg/L	1600
Chromium, total	µg/L	2.7
Copper, total	µg/L	22
Iron, total	µg/L	1200

Constituent[1]	Units	Event 2/27/2018
Lead, total	µg/L	49
Zinc, total	µg/L	61
Toxicity		
Chronic Toxicity, Biomass	P/F	PASS
Chronic Toxicity, Survival	P/F	PASS
Polynuclear Aromatic Hydrocarbons		
Acenaphthene	ng/L	ND
Acenaphthylene	ng/L	ND
Anthracene	ng/L	ND
Benz(a)anthracene	ng/L	ND
Benzo(a)pyrene	ng/L	ND
Benzo(b)fluoranthene	ng/L	ND
Benzo(g,h,i)perylene	ng/L	ND
Benzo(k)fluoranthene	ng/L	ND
Chrysene	ng/L	ND
Dibenz(a,h)anthracene	ng/L	ND
Fluoranthene	ng/L	ND
Fluorene	ng/L	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND
Naphthalene	ng/L	ND
Phenanthrene	ng/L	ND
Pyrene	ng/L	ND
Total PAHs	ng/L	ND

Table 3.18. Results for Chollas Creek TMDL Site 11-358 (SR94E/College EFF)

Bio-infiltration Swale Effluent, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 2/27/2018	TMDL Limits[1,2,3] 2/27/2018	Reference Values[4,5] CTR Values[5]	Reference Values[4,5] Basin Plan Values
TMDL-Specific Constituents					
Diazinon	ng/L	ND	72		72
Copper, dissolved	µg/L	14	62	12	12
Lead, dissolved	µg/L	3.6	41	58	58
Zinc, dissolved	µg/L	17	137	108	108
Field Measurements					
pH	pH units	7.86			6.5 to 8.5
Temperature	°C	11.1			
Specific Conductivity	µS/cm	198			
Average Flow Rate	gpm	2.15			
Bacteria					
Fecal Coliform	MPN/100mL	920			
Conventionals					
Hardness as $CaCO_3$	mg/L	57			
Nitrate as N	mg/L	0.54			
Oil & Grease	mg/L	2			
Total Dissolved Solids	mg/L	164			
Total Kjeldahl Nitrogen	mg/L	1.47			
Total Phosphorus	mg/L	0.92			
Total Suspended Solids	mg/L	17			
Total Organic Carbon	mg/L	38.8			
Dissolved Organic Carbon	mg/L	37.2			
Elements					
Aluminum, total	µg/L	2200			
Chromium, total	µg/L	2.8			
Copper, total	µg/L	17		13	
Iron, total	µg/L	700			

Constituent[1]	Units	Event 2/27/2018	TMDL Limits[1,2,3] 2/27/2018	Reference Values[4,5] CTR Values[5]	Reference Values[4,5] Basin Plan Values
Lead, total	µg/L	18		72	
Zinc, total	µg/L	28		110	
Toxicity					
Chronic Toxicity, Biomass	P/F	PASS			
Chronic Toxicity, Survival	P/F	PASS			
Polynuclear Aromatic Hydrocarbons					
Acenaphthene	ng/L	ND			
Acenaphthylene	ng/L	ND			
Anthracene	ng/L	ND			
Benz(a)anthracene	ng/L	ND			
Benzo(a)pyrene	ng/L	ND			
Benzo(b)fluoranthene	ng/L	ND			
Benzo(g,h,i)perylene	ng/L	ND			
Benzo(k)fluoranthene	ng/L	ND			
Chrysene	ng/L	ND			
Dibenz(a,h)anthracene	ng/L	ND			
Fluoranthene	ng/L	ND			
Fluorene	ng/L	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND			
Naphthalene	ng/L	ND			
Phenanthrene	ng/L	ND			
Pyrene	ng/L	ND			
Total PAHs	ng/L	ND			

Table 3.19. Results for Chollas Creek TMDL Site 11-359 (SR94E/ASF INF)

Austin Sand Filter Influent, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018
TMDL-Specific Constituents			
Diazinon	ng/L	ND	ND
Copper, dissolved	µg/L	65	26
Lead, dissolved	µg/L	3.3	0.9
Zinc, dissolved	µg/L	280	87
Field Measurements			
pH	pH units	7.55	7.24
Temperature	°C	16.4	12
Specific Conductivity	µS/cm	258.7	120
Average Flow Rate	gpm	184	57
Bacteria			
Fecal Coliform	MPN/100mL	1600	3500
Conventionals			
Hardness as $CaCO_3$	mg/L	62	37
Nitrate as N	mg/L	1.76	1.14
Oil & Grease	mg/L	4	3
Total Dissolved Solids	mg/L	184	104
Total Kjeldahl Nitrogen	mg/L	4.94	1.41
Total Phosphorus	mg/L	0.38	0.27
Total Suspended Solids	mg/L	100	20
Total Organic Carbon	mg/L	48.8	24.4
Dissolved Organic Carbon	mg/L	46.9	22.6
Elements			
Aluminum, total	µg/L	2100	200
Chromium, total	µg/L	7.9	3.3
Copper, total	µg/L	120	31
Iron, total	µg/L	2200	97

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018
Lead, total	µg/L	46	1.7
Zinc, total	µg/L	510	100
Toxicity			
Chronic Toxicity, Biomass	P/F	FAIL	PASS
Chronic Toxicity, Survival	P/F	FAIL	PASS
Polynuclear Aromatic Hydrocarbons			
Acenaphthene	ng/L	ND	ND
Acenaphthylene	ng/L	ND	ND
Anthracene	ng/L	ND	ND
Benz(a)anthracene	ng/L	ND	ND
Benzo(a)pyrene	ng/L	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND
Chrysene	ng/L	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND
Fluoranthene	ng/L	ND	ND
Fluorene	ng/L	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND
Naphthalene	ng/L	ND	ND
Phenanthrene	ng/L	ND	ND
Pyrene	ng/L	ND	ND
Total PAHs	ng/L	ND	ND

Table 3.20. Results for Chollas Creek TMDL Site 11-360 (SR94E/ASF EFF)

Austin Sand Filter Effluent, Chollas Creek Diazinon TMDL, Chollas Creek Dissolved Metals TMDL

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018	TMDL Limits[1,2,3] 1/8/2018	TMDL Limits[1,2,3] 2/27/2018	Reference Values[4,5] CTR Values[5]	Reference Values[4,5] Basin Plan Values
TMDL-Specific Constituents							
Diazinon	ng/L	ND	ND	72	72		72
Copper, dissolved	µg/L	41	27	82	34	12	12
Lead, dissolved	µg/L	0.6	0.3	56	20	58	58
Zinc, dissolved	µg/L	37	9.1	176	79	108	108
Field Measurements							
pH	pH units	7.8	7.11				6.5 to 8.5
Temperature	°C	16.5	12.8				
Specific Conductivity	µS/cm	228.7	130				
Average Flow Rate	gpm	24	18				
Bacteria							
Fecal Coliform	MPN/100mL	1600	9200				
Conventionals							
Hardness as $CaCO_3$	mg/L	87	68				
Nitrate as N	mg/L	0.33	2.13				
Oil & Grease	mg/L		2				
Total Dissolved Solids	mg/L	180	132				
Total Kjeldahl Nitrogen	mg/L	2.31	2.46				

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018	TMDL Limits[1,2,3] 1/8/2018	TMDL Limits[1,2,3] 2/27/2018	Reference Values[4,5] CTR Values[5]	Reference Values[4,5] Basin Plan Values
Total Phosphorus	mg/L	0.21	0.21				
Total Suspended Solids	mg/L	12	8				
Total Organic Carbon	mg/L	33.3	28.4				
Dissolved Organic Carbon	mg/L	32.7	27.4				
Elements							
Aluminum, total	µg/L	320	48				
Chromium, total	µg/L	4.3	2.2				
Copper, total	µg/L	56	34			13	
Iron, total	µg/L	480	84				
Lead, total	µg/L	2.9	0.6			72	
Zinc, total	µg/L	51	10			110	
Toxicity							
Chronic Toxicity, Biomass	P/F	PASS	PASS				
Chronic Toxicity, Survival	P/F	PASS	PASS				
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND				
Acenaphthylene	ng/L	ND	ND				
Anthracene	ng/L	ND	ND				
Benz(a)anthracene	ng/L	ND	ND				
Benzo(a)pyrene	ng/L	ND	ND				

Constituent[1]	Units	Event 1/8/2018	Event 2/27/2018	TMDL Limits[1,2,3] 1/8/2018	TMDL Limits[1,2,3] 2/27/2018	Reference Values[4,5] CTR Values[5]	Reference Values[4,5] Basin Plan Values
Benzo(b)fluoranthene	ng/L	ND	ND				
Benzo(g,h,i)perylene	ng/L	ND	ND				
Benzo(k)fluoranthene	ng/L	ND	ND				
Chrysene	ng/L	ND	ND				
Dibenz(a,h)anthracene	ng/L	ND	ND				
Fluoranthene	ng/L	ND	ND				
Fluorene	ng/L	ND	ND				
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND				
Naphthalene	ng/L	ND	ND				
Phenanthrene	ng/L	ND	ND				
Pyrene	ng/L	ND	ND				
Total PAHs	ng/L	ND	ND				

Table 3.12 - Table 3.20

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect

Notes:
1. Chollas Creek Diazinon TMDL. The concentration-based waste load allocation for diazinon is 0.072 µg/L, or 72 ng/L, for acute (1-hour average) conditions and 0.045 µg/L for chronic (4-day average) conditions.
2. Chollas Creek Dissolved Copper, Lead and Zinc TMDLs. The waste load allocations in this table are for the acute condition and calculated based on the hardness of the receiving water measured for each storm. Only results greater than the acute values are highlighted.
3. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit. Only results greater than the acute value are highlighted.
4. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR.
5. See Appendix D, Water Quality Reference Values for TMDL Sites.

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3.2.3 Tier 1 Project Sites

The list of Tier 1 Project sites is divided into four groups. Each group of sites is monitored by a specific monitoring contractor. Table 3.21 through Table 3.24 summarize the storm event sampling conducted at the Tier 1 Project sites during the 2017–18 wet season.

Table 3.21. Tier 1 Project Sites – Group 1

Site ID	Site Name	Event #1 Date	Event #2 Date	Event #3 Date	Event #4 Date	Event #5 Date
1-341	Weott North, Humboldt	10/19/2017	11/8/2017	12/19/2017	NA	NA
1-342	Myers Flat, Humboldt	10/19/2017	12/19/2017	4/5/2018	NA	NA
4-405	Antioch Influent	1/24/2018	3/20/2018	NA	NA	NA
4-406	Antioch Effluent	1/24/2018	3/20/2018	NA	NA	NA
4-407	Marin Hwy 131	1/8/2018	4/11/18	NA	NA	NA
4-412	4-Sol-12-0.945-INF	11/15/2017	1/8/2018	3/12/2018	NA	NA
4-413	4-Sol-12-0.945-EFF	11/15/2017	1/8/2018	3/12/2018	NA	NA
4-414	4-CC-4-23.9-INF	11/15/2017	1/8/2018	4/5/2018	NA	NA
4-415	4-CC-4-23.9-EFF	11/15/2017	1/8/2018	4/5/2018	NA	NA
4-428	Biofiltration Basin Influent	2/28/2018	3/11/2018	3/20/2018	4/5/2018	4/11/2018
4-429	Biofiltration Basin Effluent	2/28/2018	3/11/2018	3/20/2018	4/5/2018	4/11/2018
5-306	Santa Cruz HWY 1/17 IC	11/8/2017	3/12/2018	4/5/2018	NA	NA
5-307	Santa Cruz SB HWY 1 Effluent	3/12/2018	3/20/2018	4/5/2018	NA	NA
5-308	Santa Cruz SB HWY 1 Effluent	3/12/2018	3/20/2018	4/5/2018	NA	NA

Acronyms & Abbreviations:

NA = Not Applicable

Table 3.22. Tier 1 Project Sites – Group 2

Site ID	Site Name	Event #1 Date	Event #2 Date	Event #3 Date	Event #4 Date
2-303	Shasta River Influent	1/24/2018	3/13/2018	NA	NA
2-304	Shasta River Effluent	1/24/2018	3/13/2018	NA	NA
2-305	Lost River	NA	NA	NA	NA
2-306	Mad River	1/8/2018	3/13/2018	3/21/2018	NA
3-397	I-5 SB @ Consumnes	1/8/2018	3/1/2018	3/13/2018	4/6/2018
3-406	I-5 SB @ Cosumnes - Effluent	1/8/2018	3/1/2018	3/13/2018	4/6/2018

Acronyms & Abbreviations:

NA = Not Applicable

Table 3.23. Tier 1 Project Sites – Group 3

Site ID	Site Name	Event #1 Date	Event #2 Date	Event #3 Date
7-08	North Hollywood CSF Inlet	3/2/2018	3/10/2018	3/21/2018
7-09	North Hollywood CSF Outlet	3/2/2018	3/10/2018	3/21/2018

Table 3.24. Tier 1 Project Sites – Group 4

Site ID	Site Name	Event #1 Date	Event #2 Date	Event #3 Date
12-254	1137L Inlet	2/26/2018	3/10/2018	3/22/2018
12-255	1137L Outlet	2/26/2018	3/10/2018	3/22/2018
12-257	1143L Inlet	2/26/2018	3/10/2018	3/22/2018
12-258	1143L Outlet	2/26/2018	3/10/2018	3/22/2018
12-329	1049L Inlet	2/26/2018	3/10/2018	3/22/2018
12-330	1049L Outlet	2/26/2018	3/10/2018	3/22/2018

Table 3.25 through Table 3.51 present the monitoring results for the Tier 1 Project sites. Previously in the 2014–15 MRR, if a field duplicate sample was collected for a storm event, the results presented in the data tables were the average of the original sample and duplicate sample. For the 2015–16, 2016–17, and 2017–18 MRRs, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix A.

Table 3.25. Results for Tier 1 Project Site 1-341 (1-Hum-101-37.334)

TMDL Characterization Site, Lower Eel River Sediment & Temperature TMDL

Constituent[1]	Units	Event 10/19/2017	Event 11/8/2017	Event 12/19/2017	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents							
Suspended Sediment Concentration	mg/L	385	221	29	See Notes 1,2		
Temperature	°C	14.6	12.9	9.4	See Notes 1,2		
Field Measurements							
pH	pH units	7.08	7.3	6.95			6.5 to 8.5
Average Flow Rate	gpm	25.7	30.8	15.6			
Conventionals							
Hardness as $CaCO_3$	mg/L	16	6	8			
Nitrate as N	mg/L	0.079	0.043	0.07			10
Oil & Grease	mg/L	9.1	ND	1.8			
Total Dissolved Solids	mg/L	50	15	13			
Total Kjeldahl Nitrogen	mg/L	1.8	0.53	0.31			
Total Phosphorus	mg/L	0.24	0.1	0.019			
Total Suspended Solids	mg/L	29	25	10			
Bacteria							
Fecal Coliform	MPN/100mL	See Note 6	1300	See Note 7			
Elements							
Aluminum, total	µg/L	510	160	200			1000

Constituent[1]	Units	Event 10/19/2017	Event 11/8/2017	Event 12/19/2017	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Chromium, total	µg/L	1.9	0.78	0.95			
Copper, total	µg/L	7.4	3.1	2.9		13	
Iron, total	µg/L	890	280	330			
Lead, total	µg/L	0.89	0.27	0.29		65	50
Zinc, total	µg/L	120	27	30		120	
Toxicity[5]							
Chronic Toxicity, Biomass	P/F	Fail	Fail	Fail			
Chronic Toxicity, Survival	P/F	Fail	Pass	Pass			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	ND	ND	ND			

Constituent[1]	Units	Event 10/19/2017	Event 11/8/2017	Event 12/19/2017	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND			
Naphthalene	ng/L	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND			
Pyrene	ng/L	ND	ND	ND			
Total PAHs	ng/L	ND	ND	ND			

Table 3.25 (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:
1. Lower Eel River Sediment & Temperature TMDL. The waste load allocation for the sediment TMDL assigned to Caltrans is expressed as equivalent to the load locations in tons/mi^2/yr. The waste load allocation for the temperature TMDL assigned to Caltrans is zero net increase in receiving water temperature.
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. Toxicity single species is Fathead Minnows.
6. Due to the timing of the sampling period (1750 to 2050) no sample was collected for fecal coliform because it would have been well outside the holding time of six hours upon delivery to the analytical laboratory on the morning of October 20.
7. Due to the timing of the sampling period (1735 to 2035) no sample was collected for fecal coliform because it would have been well outside the holding time of six hours upon delivery to the analytical laboratory on the morning of December 20.

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Table 3.26. Results for Tier 1 Project Site 1-342 (1-Hum-101-27.673)

TMDL Characterization Site, South Fork Eel River Temperature & Sediment TMDL

Constituent[1]	Units	Event 10/19/2017	Event 12/19/2017	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents							
Suspended Sediment Concentration	mg/L	84	9.8	35	See Notes 1,2		
Temperature	°C	15.5	9.4	17.2	See Notes 1,2		
Field Measurements							
pH	pH units	6.77	6.66	6.45			6.5 to 8.5
Average Flow Rate	gpm	23.1	18.5	9.83			
Conventionals							
Hardness as $CaCO_3$	mg/L	24	16	22			
Nitrate as N	mg/L	0.095	0.098	0.027			10
Oil & Grease	mg/L	5.2	1.7	1.6			
Total Dissolved Solids	mg/L	83	33	55			
Total Kjeldahl Nitrogen	mg/L	1.6	0.4	0.88			
Total Phosphorus	mg/L	0.096	0.009	0.037			
Total Suspended Solids	mg/L	15	6	7			
Bacteria							
Fecal Coliform	MPN/100mL	See Note 6	See Note 7	See Note 8			
Elements							
Aluminum, total	µg/L	520	330	250			1000

Constituent[1]	Units	Event 10/19/2017	Event 12/19/2017	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Chromium, total	µg/L	2.2	1.5	1.4			
Copper, total	µg/L	17	4.7	9.4		13	
Iron, total	µg/L	950	560	520			
Lead, total	µg/L	1	0.43	0.35		65	
Zinc, total	µg/L	190	44	56		120	
Toxicity[5]							
Chronic Toxicity, Biomass	P/F	Fail	Fail	Fail			
Chronic Toxicity, Survival	P/F	Fail	Pass	Pass			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	ND	ND	ND			

Constituent[1]	Units	Event 10/19/2017	Event 12/19/2017	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND			
Naphthalene	ng/L	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND			
Pyrene	ng/L	ND	ND	ND			
Total PAHs	ng/L	ND	ND	ND			

Table 3.26 (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:
1. Lower Eel River Sediment & Temperature TMDL. The waste load allocation for the sediment TMDL assigned to Caltrans is expressed as equivalent to the load locations in tons/mi^2/yr. The waste load allocation for the temperature TMDL assigned to Caltrans is zero net increase in receiving water temperature.
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. Toxicity single species is Fathead Minnows.
6. Due to the timing of the sampling period (1750 to 2050) no sample was collected for fecal coliform because it would have been well outside the holding time of six hours upon delivery to the analytical laboratory on the morning of October 20.
7. Due to the timing of the sampling period (1735 to 2035) no sample was collected for fecal coliform because it would have been well outside the holding time of six hours upon delivery to the analytical laboratory on the morning of December 20.
8. Due to the timing of the sampling period (1730 to 2010) no sample was collected for fecal coliform because it would have been well outside the holding time of six hours upon delivery to the analytical laboratory on the morning of April 6.

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Table 3.27. Results for Tier 1 Project Site 4-407 (4-Mrn-131-R1.558)

TMDL Characterization Site, Richardson Bay Pathogens TMDL

Constituent[1]	Units	Event 1/8/2018	Event 4/11/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents						
Enterococcus	CFU/100 mL	727	201.4	See Notes 1,2		
Total Coliform	MPN/100mL	1700	240	See Notes 1,2		
Field Measurements						
pH	pH units	8.73	8.18			
Temperature	°C	11.4	15			
Average Flow Rate	gpm	65.4	10.8			
Conventionals						
Hardness as $CaCO_3$	mg/L	10	18			
Nitrate as N	mg/L	0.053	0.088			10
Oil & Grease	mg/L	2	6.6			
Total Dissolved Solids	mg/L	20	35			500
Total Kjeldahl Nitrogen	mg/L	0.57	0.57			
Total Phosphorus	mg/L	0.056	0.058			
Total Suspended Solids	mg/L	35	15			
Bacteria						
Fecal Coliform	MPN/100mL	79	11			
Elements						

Constituent[1]	Units	Event 1/8/2018	Event 4/11/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Aluminum, total	µg/L	950	590			1000
Chromium, total	µg/L	3.4	2			
Copper, total	µg/L	33	23		13	13
Iron, total	µg/L	1600	890			
Lead, total	µg/L	2.7	1.3		65	65
Zinc, total	µg/L	93	52		120	120
Toxicity[5]						
Chronic Toxicity, Biomass	P/F	Pass	Fail			
Chronic Toxicity, Survival	P/F	Pass	Pass			
Polynuclear Aromatic Hydrocarbons						
Acenaphthene	ng/L	ND	ND			
Acenaphthylene	ng/L	ND	ND			
Anthracene	ng/L	ND	ND			
Benz(a)anthracene	ng/L	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND			
Chrysene	ng/L	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND			

Constituent[1]	Units	Event 1/8/2018	Event 4/11/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Fluoranthene	ng/L	ND	ND			
Fluorene	ng/L	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND			
Naphthalene	ng/L	ND	ND			
Phenanthrene	ng/L	ND	ND			
Pyrene	ng/L	ND	ND			
Total PAHs	ng/L	ND	ND			

Table 3.27 (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:
1. Richardson Bay Pathogens TMDL. The waste load allocation for Fecal Coliform assigned to Caltrans is a median of <14 MPN/100 mL and a 90th percentile of <43 MPN/100mL (no more than 10 percent of total samples during any 30-day period may exceed this number).
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. Toxicity species to be used is the fathead minnow.

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Table 3.28. Results for Tier 1 Project Site 4-412 (4-Sol-12-0.945)

Bioswale Influent, Napa River Sediment TMDL

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 3/12/2018
TMDL-Specific Constituents				
Suspended Sediment Concentration	mL/L	18	38	62
Field Measurements				
pH	pH units	6.02	6.26	6.88
Temperature	°C	14.1	10.1	14.1
Average Flow Rate	gpm	22.4	43.7	13.2
Conventionals				
Hardness as $CaCO_3$	mg/L	22	22	34
Nitrate as N	mg/L	0.15	0.16	0.22
Oil & Grease	mg/L	ND	3.7	16
Total Dissolved Solids	mg/L	28	38	65
Total Kjeldahl Nitrogen	mg/L	1.3	1.2	0.92
Total Phosphorus	mg/L	0.13	0.12	0.11
Total Suspended Solids	mg/L	58	43	31
Bacteria				
Fecal Coliform	MPN/100mL	3500	16000	1400
Elements				
Aluminum, total	µg/L	920	1000	820
Chromium, total	µg/L	32	24	31
Copper, total	µg/L	20	24	27
Iron, total	µg/L	1800	2200	1600
Lead, total	µg/L	2.6	3.1	2.6
Zinc, total	µg/L	81	100	71
Toxicity[5]				
Chronic Toxicity, Biomass	P/F	Fail	Pass	Pass
Chronic Toxicity, Survival	P/F	Pass	Pass	Pass
Polynuclear Aromatic Hydrocarbons				

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 3/12/2018
Acenaphthene	ng/L	ND	ND	ND
Acenaphthylene	ng/L	ND	ND	ND
Anthracene	ng/L	ND	ND	ND
Benz(a)anthracene	ng/L	ND	ND	ND
Benzo(a)pyrene	ng/L	ND	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND	ND
Chrysene	ng/L	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND	ND
Fluoranthene	ng/L	ND	ND	ND
Fluorene	ng/L	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND
Naphthalene	ng/L	ND	ND	ND
Phenanthrene	ng/L	ND	ND	ND
Pyrene	ng/L	ND	ND	96.6
Total PAHs	ng/L	ND	ND	96.6

Table 3.29. Results for Tier 1 Project Site 4-413 (4-Sol-12-0.945)

Bioswale Effluent, Napa River Sediment TMDL

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 3/12/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents							
Suspended Sediment Concentration	mL/L	2.5	6.6	9.2	See Notes 1,2		
Field Measurements							
pH	pH units	5.67	6.49	6.52			6.5 to 8.5
Temperature	°C	13.9	10.5	13.4			
Average Flow Rate	gpm	10.9	26.6	5.9			
Conventionals							
Hardness as $CaCO_3$	mg/L	36	44	64			
Nitrate as N	mg/L	0.71	1.2	0.18			10
Oil & Grease	mg/L	ND	1.4	3.1			
Total Dissolved Solids	mg/L	79	88	110			500
Total Kjeldahl Nitrogen	mg/L	0.97	0.88	0.53			
Total Phosphorus	mg/L	0.15	0.17	0.097			
Total Suspended Solids	mg/L	4	6	7			
Bacteria							
Fecal Coliform	MPN/100mL	1700	3100	1100			
Elements							
Aluminum, total	µg/L	410	490	720			1000

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 3/12/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Chromium, total	µg/L	18	13	16			
Copper, total	µg/L	9.7	9	11		13	13
Iron, total	µg/L	670	910	1200			300
Lead, total	µg/L	0.62	0.86	0.97		65	65
Zinc, total	µg/L	10	13	15		120	120
Toxicity[5]							
Chronic Toxicity, Biomass	P/F	Pass	Pass	Pass			
Chronic Toxicity, Survival	P/F	Pass	Pass	Pass			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	ND	ND	ND			

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 3/12/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND			
Naphthalene	ng/L	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND			
Pyrene	ng/L	ND	ND	ND			
Total PAHs	ng/L	ND	ND	ND			

Table 3.28, Table 3.29 (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:
1. Napa River Sediment TMDL. Caltrans is deemed to be implementing appropriate control measures if it discharges in compliance with the Permit, and if it conducts the monitoring program included in the Permit.
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit. Only results greater than the acute value are highlighted.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. Toxicity species to be used is Fathead minnow.

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Table 3.30. Results for Tier 1 Project Site 4-414 (4-CC-4-23.9)

Bioswale Influent, Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 4/5/2018
TMDL-Specific Constituents[2]				
Methyl Mercury	ng/L	0.07	0.11	0.22
Diazinon	ng/L	ND	ND	ND
Suspended Sediment Concentration	mL/L	17	35	54
Ceriodaphnia dubia - Survival	P/F	Pass	Pass	See Note 8
Ceriodaphnia dubia - Young/female	P/F	Fail	Pass	See Note 8
Chironomus dilutus - Survival	P/F	Pass	Pass	See Note 8
Hyalella azteca - Survival	P/F	Fail	Fail	See Note 8
Field Measurements				
pH	pH units	7.5	7.89	6.58
Temperature	°C	14.61	10.4	13.3
Average Flow Rate	gpm	16	27.1	18.1
Conventionals				
Hardness as $CaCO_3$	mg/L	40	34	46
Nitrate as N	mg/L	0.31	0.23	0.21
Oil & Grease	mg/L	ND	8.4	4.5
Total Dissolved Solids	mg/L	61	45	48
Total Kjeldahl Nitrogen	mg/L	1.9	0.92	0.7
Total Phosphorus	mg/L	0.15	0.094	0.11
Total Suspended Solids	mg/L	50	34	64
Bacteria				
Fecal Coliform	MPN/100mL	170	3500	5400
Elements				
Aluminum, total	µg/L	1400	950	2000
Chromium, total	µg/L	5.2	3.7	6.3
Copper, total	µg/L	25	20	28
Iron, total	µg/L	2300	1700	3000

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 4/5/2018
Lead, total	µg/L	6.8	5.8	5.2
Zinc, total	µg/L	130	98	130
Toxicity[7]				
Chronic Toxicity, Biomass	P/F	Pass	Pass	See Note 8
Chronic Toxicity, Survival	P/F	Pass	Pass	See Note 8
Polynuclear Aromatic Hydrocarbons				
Acenaphthene	ng/L	ND	ND	ND
Acenaphthylene	ng/L	ND	ND	ND
Anthracene	ng/L	ND	ND	ND
Benz(a)anthracene	ng/L	ND	ND	ND
Benzo(a)pyrene	ng/L	ND	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND	ND
Chrysene	ng/L	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND	ND
Fluoranthene	ng/L	ND	ND	ND
Fluorene	ng/L	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND
Naphthalene	ng/L	ND	ND	ND
Phenanthrene	ng/L	ND	ND	ND
Pyrene	ng/L	ND	ND	ND
Total PAHs	ng/L	ND	ND	ND

Table 3.31. Results for Tier 1 Project Site 4-415 (4-CC-4-23.9)

Bioswale Effluent, Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 4/5/2018	TMDL Limits	Reference Values[5,6] CTR Values	Reference Values[5,6] Basin Plan Values
TMDL-Specific Constituents[2]							
Methyl Mercury	ng/L	0.56	0.29	0.55	See Notes 1,4		0.05
Diazinon	ng/L	ND	ND	ND	100		
Suspended Sediment Concentration	mL/L	5.1	4.2	ND			
Ceriodaphnia dubia - Survival	P/F	Pass	Pass	See Note 8	See Notes 3,4		
Ceriodaphnia dubia - Young/female	P/F	Pass	Pass	See Note 8	See Notes 3,4		
Chironomus dilutus - Survival	P/F	Fail	Pass	See Note 8	See Notes 3,4		
Hyalella azteca - Survival	P/F	Pass	Pass	See Note 8	See Notes 3,4		
Field Measurements							
pH	pH units	7.37	6.7	5.81			6.5 to 8.5
Temperature	°C	15.27	10.4	15			
Average Flow Rate	gpm	11.9	17	6.49			
Conventionals							
Hardness as $CaCO_3$	mg/L	66	40	50			
Nitrate as N	mg/L	2.8	0.37	0.66			
Oil & Grease	mg/L	ND	1.6	ND			
Total Dissolved Solids	mg/L	140	48	79			500
Total Kjeldahl Nitrogen	mg/L	1.6	0.62	0.62			

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 4/5/2018	TMDL Limits	Reference Values[5,6] CTR Values	Reference Values[5,6] Basin Plan Values
Total Phosphorus	mg/L	0.26	0.19	0.17			
Total Suspended Solids	mg/L	6	3	3			
Bacteria							
Fecal Coliform	MPN/100mL	1700	1600	230			
Elements							
Aluminum, total	µg/L	110	180	180			1000
Chromium, total	µg/L	1.4	1.5	1.5			
Copper, total	µg/L	10	5.6	4.9		13	13
Iron, total	µg/L	260	350	330			
Lead, total	µg/L	0.85	1.3	0.83		65	65
Zinc, total	µg/L	16	12	11		120	120
Toxicity[7]							
Chronic Toxicity, Biomass	P/F	Pass	Pass	See Note 8			
Chronic Toxicity, Survival	P/F	Pass	Pass	See Note 8			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			

Constituent[1]	Units	Event 11/15/2017	Event 1/8/2018	Event 4/5/2018	TMDL Limits	Reference Values[5,6] CTR Values	Reference Values[5,6] Basin Plan Values
Benzo(b)fluoranthene	ng/L	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	ND	ND	ND			
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND			
Naphthalene	ng/L	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND			
Pyrene	ng/L	ND	ND	ND			
Total PAHs	ng/L	ND	ND	ND			

Table 3.30, Table 3.31. (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect

Notes:
1. Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL. There are no waste load allocations specific to Caltrans. However, allocations for each of the defined municipal entities include all current and future permitted discharges within the geographic boundaries of these municipalities and unincorporated areas, including Caltrans.
2. San Francisco Bay Mercury TMDL. There are no waste load allocations specific to Caltrans. Instead, Caltrans' waste load allocation is an unspecified portion of the waste load allocation assigned to the city or municipal NPDES permit in which Caltrans' roads or facilities resides.
3. San Francisco Bay Urban Creeks Diazinon and Pesticide TMDL. The waste load allocation assigned to Caltrans is 100 ng/L as a one-hour average.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water

Permit. Only results greater than the acute value are highlighted.
5. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
6. See Appendix D, Water Quality Reference Values for TMDL Sites.
7. Toxicity species to be used is Fathead minnow.
8. Insufficient sample volume collected for toxicity testing at site 4-415. Toxicity testing canceled at paired influent site 4-414 as well.

Table 3.32. Results for Tier 1 Project Site 4-428 (Biofiltration Basin Influent)

Biofiltration Basin Influent, San Francisco Bay Mercury TMDL, San Francisco Bay PCBs TMDL

Constituent[1]	Units	Event 2/28/2018	Event 3/11/2018	Event 3/20/2018	Event 4/5/2018	Event 4/11/2018
TMDL-Specific Constituents						
Mercury	ng/L	0.0098	0.017	0.0085	0.015	0.011
Suspended Sediment Concentration	mL/L	8.5	37	3	42	50
Field Measurements						
pH	pH units	7.25	7.1	7	7	7.75
Temperature	°C	11.9	15	12.6	14.9	13.3
Average Flow Rate	gpm	456	162	280	906	105
Conventionals						
Hardness as $CaCO_3$	mg/L	72	110	100	74	180
Nitrate as N	mg/L	0.4	0.34	0.41	0.36	0.45
Oil & Grease	mg/L	2.1	5.6	ND	2	4
Total Dissolved Solids	mg/L	130	180	150	140	300
Total Kjeldahl Nitrogen	mg/L	0.66	1.1	0.62	0.83	0.83
Total Phosphorus	mg/L	0.11	0.13	0.087	0.11	0.11
Total Suspended Solids	mg/L	27	40	13	11	13
Bacteria						
Fecal Coliform	MPN/100mL	700	2800	1100	2400	5400
Elements						

Constituent[1]	Units	Event 2/28/2018	Event 3/11/2018	Event 3/20/2018	Event 4/5/2018	Event 4/11/2018
Aluminum, total	µg/L	570	960	570	1600	460
Chromium, total	µg/L	3.6	6.3	3.3	4.2	3.1
Copper, total	µg/L	12	16	7	8.4	7.8
Iron, total	µg/L	1100	2000	1100	2100	1300
Lead, total	µg/L	1.9	2.9	1	1.4	0.59
Zinc, total	µg/L	44	68	24	26	23
Toxicity						
Chronic Toxicity, Biomass	P/F	Pass	Fail	Pass	See Note 7	Pass
Chronic Toxicity, Survival	P/F	Pass	Fail	Pass	See Note 7	Pass
Polynuclear Aromatic Hydrocarbons						
Acenaphthene	ng/L	ND	ND	ND	ND	ND
Acenaphthylene	ng/L	ND	ND	ND	ND	ND
Anthracene	ng/L	ND	ND	ND	ND	ND
Benz(a)anthracene	ng/L	ND	ND	ND	ND	ND
Benzo(a)pyrene	ng/L	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND	ND	ND	ND
Chrysene	ng/L	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND	ND	ND	ND

Constituent[1]	Units	Event 2/28/2018	Event 3/11/2018	Event 3/20/2018	Event 4/5/2018	Event 4/11/2018
Fluoranthene	ng/L	ND	ND	ND	ND	ND
Fluorene	ng/L	ND	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND	ND	ND
Naphthalene	ng/L	ND	ND	ND	ND	ND
Phenanthrene	ng/L	ND	ND	ND	ND	ND
Pyrene	ng/L	ND	82.8	ND	ND	ND
Total PAHs	ng/L	ND	82.8	ND	ND	ND

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Table 3.33. Results for Tier 1 Project Site 4-429 (Biofiltration Basin Effluent)

San Francisco Bay Mercury TMDL, San Francisco Bay PCBs TMDL

Constituent	Units	Event 2/28/2018	Event 3/11/2018	Event 3/20/2018	Event 4/5/2018	Event 4/11/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents									
Mercury	ng/L	0.015	0.013	0.0085	0.012	0.012	See Notes 1,2		
Suspended Sediment Concentration	mL/L	5.7	5.5	ND	4.2	ND			
Field Measurements									
pH	pH units	7.03	6.61	6.76	7	7.11			6.5 to 8.5
Temperature	°C	12.5	15	12.6	15.7	15.8			
Average Flow Rate	gpm	243	80.3	158	477	41.5			
Conventionals									
Hardness as $CaCO_3$	mg/L	160	210	180	130	330			
Nitrate as N	mg/L	0.71	0.37	0.18	0.14	0.39			
Oil & Grease	mg/L	ND	2.6	ND	ND	ND			
Total Dissolved Solids	mg/L	360	390	330	230	550			500
Total Kjeldahl Nitrogen	mg/L	2.9	1.9	1.2	1.5	0.92			
Total Phosphorus	mg/L	0.91	0.69	0.84	0.66	0.5			
Total Suspended Solids	mg/L	14	3	2	6	1			
Bacteria									

Constituent	Units	Event 2/28/2018	Event 3/11/2018	Event 3/20/2018	Event 4/5/2018	Event 4/11/2018	Reference Values[3,4] TMDL Limits	CTR Values	Basin Plan Values
Fecal Coliform	MPN/100mL	700	350	350	240	46			
Elements									
Aluminum, total	µg/L	200	75	63	470	81			1000
Chromium, total	µg/L	2	1	0.9	2	0.89			
Copper, total	µg/L	15	11	7.6	7.1	6.4		13	13
Iron, total	µg/L	580	430	440	720	720			
Lead, total	µg/L	0.69	0.33	0.2	0.49	0.1		65	65
Zinc, total	µg/L	8.5	4.9	6.5	5.9	3.3		120	120
Toxicity[5]									
Chronic Toxicity, Biomass	P/F	Pass	See Note 6	Pass	See Note 7	Pass			
Chronic Toxicity, Survival	P/F	Pass	See Note 6	Pass	See Note 7	Pass			
Polynuclear Aromatic Hydrocarbons									
Acenaphthene	ng/L	ND	ND	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND	ND	ND			

Constituent	Units	Event 2/28/2018	Event 3/11/2018	Event 3/20/2018	Event 4/5/2018	Event 4/11/2018	Reference Values[3,4] TMDL Limits	CTR Values	Basin Plan Values
Benzo(k)fluoranthene	ng/L	ND	ND	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND	ND	ND			
Fluoranthene	ng/L	ND	ND	ND	ND	ND			
Fluorene	ng/L	ND	ND	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND	ND	ND			
Naphthalene	ng/L	ND	45.7	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND	ND	ND			
Pyrene	ng/L	ND	ND	ND	ND	ND			
Total PAHs	ng/L	ND	45.7	ND	ND	ND			

Table 3.32, Table 3.33. (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:
1. San Francisco Bay Mercury TMDL. There are no waste load allocations specific to Caltrans. Instead, Caltrans' waste load allocation is an unspecified portion of the waste load allocation assigned to the city or municipal NPDES permit in which Caltrans' roads or facilities resides.
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. Toxicity species to be used is Fathead minnow.
6. Insufficient sample volume to perform toxicity testing.

7. Toxicity lab mixed up sample bottles and tested the wrong sample.

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Table 3.34. Results for Tier 1 Project Site 5-306 (5-SCr-01-17.197)

TMDL Characterization, San Lorenzo River (includes Carbonera, Lompico, and Shingle Mills Creeks) Sediment TMDL

Constituent[1]	Units	Event 11/8/2017	Event 3/12/2018	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents							
Suspended Sediment Concentration	mg/L	21	ND	93	See Notes 1,2		
Field Measurements							
pH	pH units	7.81	7.95	7.8			
Temperature	°C	14.9	14.7	13.8			
Average Flow Rate	gpm	648	1320	860			
Conventionals							
Hardness as $CaCO_3$	mg/L	120	170	92			
Nitrate as N	mg/L	1.2	1.4	0.99			
Oil & Grease	mg/L	1.8	ND	ND			
Total Dissolved Solids	mg/L	260	370	190			
Total Kjeldahl Nitrogen	mg/L	3.8	0.4	1.4			
Total Phosphorus	mg/L	0.83	0.14	0.24			
Total Suspended Solids	mg/L	182	ND	35			
Bacteria							
Fecal Coliform	MPN/100mL	16000	310	4600			
Elements							
Aluminum, total	µg/L	3800	27	1700			1000

Constituent[1]	Units	Event 11/8/2017	Event 3/12/2018	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Chromium, total	µg/L	6.1	0.22	3.1			
Copper, total	µg/L	26	1.1	16		13	30
Iron, total	µg/L	7500	340	2000			
Lead, total	µg/L	22	0.14	4.7		65	30
Zinc, total	µg/L	130	2	60		120	200
Toxicity[5]							
Chronic Toxicity, Biomass	P/F	Pass	Pass	Pass			
Chronic Toxicity, Survival	P/F	Pass	Pass	Pass			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	ND	ND	ND			

Constituent[1]	Units	Event 11/8/2017	Event 3/12/2018	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND			
Naphthalene	ng/L	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND			
Pyrene	ng/L	ND	ND	ND			
Total PAHs	ng/L	ND	ND	ND			

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Table 3.35. Results for Tier 1 Project Site 5-307 (5-SCr-01-16.6)

Bioswale Influent, San Lorenzo River (includes Carbonera, Lompico, and Shingle Mills Creeks) Sediment TMDL

Constituent	Units	Event 3/12/2018	Event 3/20/2018	Event 4/5/2018
TMDL-Specific Constituents				
Suspended Sediment Concentration	mg/L	103	172	21
Field Measurements				
pH	pH units	8.93	8.61	7.2
Temperature	°C	14.1	13.2	14.2
Average Flow Rate	gpm	38.3	99.5	117
Conventionals				
Hardness as $CaCO_3$	mg/L	28	24	14
Nitrate as N	mg/L	0.26	0.39	0.051
Oil & Grease	mg/L	4.4	3.9	1.8
Total Dissolved Solids	mg/L	41	30	18
Total Kjeldahl Nitrogen	mg/L	0.83	0.53	0.44
Total Phosphorus	mg/L	0.12	0.071	0.053
Total Suspended Solids	mg/L	46	26	3
Bacteria				
Fecal Coliform	MPN/100mL	16000	540	240
Elements				
Aluminum, total	µg/L	1600	750	220
Chromium, total	µg/L	7.1	4.5	1.6
Copper, total	µg/L	43	16	7.3
Iron, total	µg/L	2100	960	270
Lead, total	µg/L	4	1.9	0.69
Zinc, total	µg/L	130	62	34
Toxicity[5]				
Chronic Toxicity, Biomass	P/F	Fail	Pass	Fail
Chronic Toxicity, Survival	P/F	Pass	Pass	Pass
Polynuclear Aromatic Hydrocarbons				

Constituent	Units	Event 3/12/2018	Event 3/20/2018	Event 4/5/2018
Acenaphthene	ng/L	ND	ND	ND
Acenaphthylene	ng/L	ND	ND	ND
Anthracene	ng/L	ND	ND	ND
Benz(a)anthracene	ng/L	ND	ND	ND
Benzo(a)pyrene	ng/L	ND	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND	ND
Chrysene	ng/L	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND	ND
Fluoranthene	ng/L	ND	ND	ND
Fluorene	ng/L	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND
Naphthalene	ng/L	ND	ND	ND
Phenanthrene	ng/L	ND	ND	ND
Pyrene	ng/L	116	49.4	ND
Total PAHs	ng/L	116	49.4	ND

Table 3.36. Results for Tier 1 Project Site 5-308 (5-SCr-01-16.6)

Bioswale Effluent, San Lorenzo River (includes Carbonera, Lompico, and Shingle Mills Creeks) Sediment TMDL

Constituent[1]	Units	Event 3/12/2018	Event 3/20/2018	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents							
Suspended Sediment Concentration	mg/L	70	254	15	See Notes 1,2		
Field Measurements							
pH	pH units	8.99	8.7	7.1			
Temperature	°C	14.3	13.2	14.1			
Average Flow Rate	gpm	35.4	157	179			
Conventionals							
Hardness as $CaCO_3$	mg/L	26	16	22			
Nitrate as N	mg/L	0.25	0.37	0.15			
Oil & Grease	mg/L	5.5	3.6	ND			
Total Dissolved Solids	mg/L	36	26	28			
Total Kjeldahl Nitrogen	mg/L	0.83	0.57	0.66			
Total Phosphorus	mg/L	0.078	0.089	0.098			
Total Suspended Solids	mg/L	35	40	26			
Bacteria							
Fecal Coliform	MPN/100mL	24000	3500	5400			
Elements							
Aluminum, total	µg/L	1200	1400	760			

Constituent[1]	Units	Event 3/12/2018	Event 3/20/2018	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Chromium, total	µg/L	6.3	5.6	7.3			
Copper, total	µg/L	35	25	29		13	30
Iron, total	µg/L	1600	1700	1100			
Lead, total	µg/L	3.2	3	2.8		65	30
Zinc, total	µg/L	96	91	77		120	120
Toxicity							
Chronic Toxicity, Biomass	P/F	Pass	Pass	Pass			
Chronic Toxicity, Survival	P/F	Pass	Pass	Pass			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	ND	ND	ND			

Constituent[1]	Units	Event 3/12/2018	Event 3/20/2018	Event 4/5/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND			
Naphthalene	ng/L	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND			
Pyrene	ng/L	108	72.5	ND			
Total PAHs	ng/L	108	72.5	ND			

Table 3.34, Table 3.35, Table 3.36. (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:
1. San Lorenzo River (includes Carbonera, Lompico, and Shingle Mills Creeks) Sediment TMDL. There are no waste load allocations specific to Caltrans.
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit. Only results greater than the acute value are highlighted.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan freshwater hard values and acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. Toxicity species to be used is Fathead minnow.

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Table 3.37. Results for Tier 1 Project Site 2-303 (Shasta River Influent)

Detention Basin Influent, Klamath River in California Temperature, Dissolved Oxygen, Nutrients and Microcystin TMDL, Shasta River Dissolved Oxygen and Temperature TMDL

Constituent	Units	Event 1/24/2018	Event 3/13/2018
TMDL-Specific Constituents			
Nitrite as N	mg/L	0.02	0.005
Total Nitrogen	mg/L	0.743	0.468
Turbidity	NTU	28.5	75.9
Total Settleable Solids	mL/L	ND	ND
Field Measurements			
pH	pH units	7.6	9.1
Temperature	°C	3.8	9
Average Flow Rate	gpm	10.7	18.2
Conventionals			
Hardness as $CaCO_3$	mg/L	78	36
Nitrate as N	mg/L	0.42	0.38
Oil & Grease	mg/L	ND	ND
Total Dissolved Solids	mg/L	597	274
Total Kjeldahl Nitrogen	mg/L	0.3	0.5
Total Phosphorus	mg/L	0.05	0.18
Total Suspended Solids	mg/L	15.1	13.8
Elements			
Aluminum, total	µg/L	893	2440
Chromium, total	µg/L	2.8	6.7
Copper, total	µg/L	4.9	12.7
Iron, total	µg/L	1110	3140
Lead, total	µg/L	0.6	1.6
Zinc, total	µg/L	22.8	41.6

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Table 3.38. Results for Tier 1 Project Site 2-304 (Shasta River Effluent)

Detention Basin Effluent, Klamath River in California Temperature, Dissolved Oxygen, Nutrients and Microcystin TMDL, Shasta River Dissolved Oxygen and Temperature TMDL

Constituent	Units	Event 1/24/2018	Event 3/13/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents						
Nitrite as N	mg/L	0.019	0.005	See Notes 1,2		1
Total Nitrogen	mg/L	1.2	0.536	See Notes 1,2		
Turbidity	NTU	34.5	42	See Notes 1,2		
Total Settleable Solids	mL/L	ND	ND	See Notes 1,2		
Field Measurements						
pH	pH units	7.76	8.5			6.5 to 8.5
Temperature	°C	4.1	12			
Average Flow Rate	gpm	5.6	13.6			
Conventionals						
Hardness as $CaCO_3$	mg/L	71	79			
Nitrate as N	mg/L	0.66	0.57			10
Oil & Grease	mg/L	ND	ND			
Total Dissolved Solids	mg/L	290	413			
Total Kjeldahl Nitrogen	mg/L	0.5	0.5			
Total Phosphorus	mg/L	0.04	0.11			
Total Suspended Solids	mg/L	16.9	11.2			
Bacteria						

Constituent	Units	Event 1/24/2018	Event 3/13/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Fecal Coliform	MPN/100mL	8	23			
Elements						
Aluminum, total	µg/L	2990	1840			1000
Chromium, total	µg/L	2.9	3.8			
Copper, total	µg/L	7.6	8.8		13	
Iron, total	µg/L	2030	1880			
Lead, total	µg/L	1.1	1.2		65	50
Zinc, total	µg/L	56	76.5		120	
Toxicity[5]						
Chronic Toxicity, Biomass	P/F	Pass	Pass			
Chronic Toxicity, Survival	P/F	Pass	Pass			
Polynuclear Aromatic Hydrocarbons						
Acenaphthene	ng/L	ND	ND			
Acenaphthylene	ng/L	ND	ND			
Anthracene	ng/L	ND	ND			
Benz(a)anthracene	ng/L	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND			

Constituent	Units	Event 1/24/2018	Event 3/13/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Chrysene	ng/L	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND			
Fluoranthene	ng/L	ND	ND			
Fluorene	ng/L	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND			
Naphthalene	ng/L	ND	ND			
Phenanthrene	ng/L	ND	ND			
Pyrene	ng/L	ND	ND			
Total PAHs	ng/L	ND	ND			

Table 3.37, Table 3.38. (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect

Notes:
1. Klamath River In California Temperature, Dissolved Oxygen, Nutrients and Microcystin TMDL. There are no waste load allocations specific to Caltrans. Caltrans is expected to address nutrient inputs into the Klamath River watershed through control of sediment from its road and highway facilities.
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit. Only results greater than the acute value are highlighted.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. Toxicity species to be used is Fathead minnow. Toxicity samples collected at effluent station, Site 2-304 (Shasta River Effluent) only.

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Table 3.39. Results for Tier 1 Project Site 2-306 (Mad River)

TMDL Characterization, Mad River Sediment and Turbidity TMDL

Constituent	Units	Event 1/8/2018	Event 3/13/2018	Event 3/21/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents							
Total Settleable Solids	mL/L	ND	ND	ND	See Notes 1,2		
Suspended Sediment Concentration	mg/L	17	75	99	See Notes 1,2		
Turbidity	NTU	40.6	102	152	See Notes 1,2		
Field Measurements							
pH	pH units	6.94	See Note 6	8.85			6.5 to 8.5
Temperature	°C	8.3	9.5	11.7			
Average Flow Rate	gpm	1.06	5.9	12.9			
Conventionals							
Hardness as $CaCO_3$	mg/L	ND	ND	ND			
Nitrate as N	mg/L	ND	0.02	0.02			10
Oil & Grease	mg/L	ND	ND	See Note 7			
Total Dissolved Solids	mg/L	36	59	44			
Total Kjeldahl Nitrogen	mg/L	0.4	0.6	0.6			
Total Phosphorus	mg/L	0.13	0.26	0.35			
Total Suspended Solids	mg/L	10.0	65	88			
Bacteria							
Fecal Coliform	MPN/100mL	23	500	See Note 7			

Constituent	Units	Event 1/8/2018	Event 3/13/2018	Event 3/21/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Elements							
Aluminum, total	µg/L	1640	3710	6620			1000
Chromium, total	µg/L	3.6	9.2	14.2			
Copper, total	µg/L	3.5	7.6	9.2		13	
Iron, total	µg/L	2010	5630	7900			
Lead, total	µg/L	1.0	2.7	3.1		65	50
Zinc, total	µg/L	116	90.8	65.7		120	
Toxicity[5]							
Chronic Toxicity, Biomass	P/F	Fail	Fail	Pass			
Chronic Toxicity, Survival	P/F	Fail	Fail	Pass			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	87.2	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	109	43.8			
Benzo(g,h,i)perylene	ng/L	ND	44.9	ND			
Benzo(k)fluoranthene	ng/L	ND	44.3	ND			
Chrysene	ng/L	ND	79.2	ND			

Constituent	Units	Event 1/8/2018	Event 3/13/2018	Event 3/21/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	ND	87.3	28.9			
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	43.2	ND			
Naphthalene	ng/L	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND			
Pyrene	ng/L	ND	95.6	27.4			
Total PAHs	ng/L	ND	591	100			

Table 3.39. (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:
1. Mad River Sediment and Turbidity TMDL. The waste load allocations for sediment and turbidity assigned to Caltrans are equivalent to and represented by the load allocations, and the load allocations are expressed on a unit loading basis (tons/mi^2/yr).
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit. Only results greater than the acute value are highlighted.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. Toxicity species to be used is Fathead minnow.
6. pH value not taken due to an error with the field probe.
7. rainfall runoff ceased after 6 aliquots were collected. Grab samples were not collected due to the sudden stop in runoff.

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Table 3.40. Results for Tier 1 Project Site 3-397 (I-5 Southbound at Consumnes)

TMDL Characterization, Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 4/6/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents								
Methyl Mercury	ng/L	0.12	0.22	0.31	0.16	See Notes 1,2		
Total Settleable Solids	mL/L	0.4	0.2	0.3	See Note 5			
Turbidity	NTU	300	380	35	See Note 5			
Field Measurements								
pH	pH units	8.50	9.15	9.90	9.42			6.5 to 8.5
Temperature	°C	10.4	10.63	15.59	15.62			
Average Flow Rate	gpm	32.2	17.8	5.3	17.8			
Conventionals								
Hardness as $CaCO_3$	mg/L	100	190	260	140			
Nitrate as N	mg/L	0.53	2.2	3	1.4			
Oil & Grease	mg/L	2.7	5.5	6	2.7			
Total Dissolved Solids	mg/L	45	170	110	48			
Total Kjeldahl Nitrogen	mg/L	0.7	1.7	1.4	1.4			
Total Phosphorus	mg/L	0.36	0.64	0.81	0.47			
Total Suspended Solids	mg/L	541	869	1120	548			
Elements								
Aluminum, total	µg/L	13000	26000	37000	16000			

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 4/6/2018	TMDL Limits	Reference Values[3,4] CTR Values[4]	Reference Values[3,4] Basin Plan Values
Chromium, total	µg/L	37	66	91	47			
Copper, total	µg/L	42	87	100	61		13	
Iron, total	µg/L	19000	30000	43000	22000			
Lead, total	µg/L	10	20	25	15		65	
Zinc, total	µg/L	170	270	310	190		120	
Aluminum, dissolved	µg/L	79	190	150	59			
Chromium, dissolved	µg/L	0.61	3.6	4.6	2			
Copper, dissolved	µg/L	2.2	5.6	7.6	4.3			
Iron, dissolved	µg/L	60	190	220	110			
Lead, dissolved	µg/L	ND	0.18	0.21	ND			
Zinc, dissolved	µg/L	1.4	6.4	23	ND			

Table 3.41. Results for Tier 1 Project Site 3-406 (I-5 Southbound Effluent)

Bioswale Effluent, Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 4/6/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents								
Methyl Mercury	ng/L	0.05	0.09	0.11	0.07	See Notes 1,2		
Total Settleable Solids	mL/L	ND	ND	ND	See Note 5			
Turbidity	NTU	24	37	50	See Note 5			
Field Measurements								
pH	pH units	6.49	7.89	See Note 7	7.86			6.5 to 8.5
Temperature	°C	10.93	10.3	See Note 7	15.36			
Average Flow Rate	gpm	202	57.9	11.3	31.6			
Conventionals								
Hardness as $CaCO_3$	mg/L	44	68	96	70			
Nitrate as N	mg/L	0.42	0.35	0.23	0.2			
Oil & Grease	mg/L	ND	ND	2.5	ND			
Total Dissolved Solids	mg/L	81	84	140	100			
Total Kjeldahl Nitrogen	mg/L	0.88	0.57	0.66	0.66			
Total Phosphorus	mg/L	0.26	0.21	0.21	0.24			
Total Suspended Solids	mg/L	17	26	24	27			
Bacteria								
Fecal Coliform	MPN/100mL	920	350	350	2400			

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 4/6/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Elements								
Aluminum, total	µg/L	790	1500	2200	1300			
Chromium, total	µg/L	3.2	5.2	6.5	4.8			
Copper, total	µg/L	6.5	8.9	9.7	9.3		13	
Iron, total	µg/L	1300	1800	2800	2000			
Lead, total	µg/L	0.83	1.3	1.4	1.2		65	
Zinc, total	µg/L	21	24	27	24		120	
Aluminum, dissolved	µg/L	35	26	190	39			
Chromium, dissolved	µg/L	0.71	1.1	1.6	0.88			
Copper, dissolved	µg/L	4	5.6	6.7	5.1			
Iron, dissolved	µg/L	90	140	280	150			
Lead, dissolved	µg/L	ND	ND	0.14	ND			
Zinc, dissolved	µg/L	3.2	3.1	130	3.8			
Toxicity[6]								
Chronic Toxicity, Biomass	P/F	Pass	Pass	Pass	Pass			
Chronic Toxicity, Survival	P/F	Pass	Pass	Pass	Pass			
Polynuclear Aromatic Hydrocarbons								
Acenaphthene	ng/L	ND	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND	ND			

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 4/6/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Benz(a)anthracene	ng/L	ND	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND	ND			
Fluoranthene	ng/L	ND	ND	ND	ND			
Fluorene	ng/L	ND	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND	ND			
Naphthalene	ng/L	ND	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND	ND			
Pyrene	ng/L	ND	ND	ND	ND			
Total PAHs	ng/L	ND	ND	ND	ND			

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Table 3.42. Results for Tier 1 Project Site 4-405 (Antioch Influent)

Biofiltration Basin Influent, Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL

Constituent[1]	Units	Event 1/24/2018	Event 3/20/2018
TMDL-Specific Constituents			
Methyl Mercury	ng/L	0.1	0.09
Suspended Sediment Concentration	mL/L	14	ND
Total Settleable Solids	mL/L	0.1	ND
Turbidity	NTU	45	37
Field Measurements			
pH	pH units	8.37	8.82
Temperature	°C	12	17
Average Flow Rate	gpm	10.5	18.3
Conventionals			
Hardness as $CaCO_3$	mg/L	86	72
Nitrate as N	mg/L	0.71	0.63
Oil & Grease	mg/L	2.3	ND
Total Dissolved Solids	mg/L	140	120
Total Kjeldahl Nitrogen	mg/L	3.7	1.1
Total Phosphorus	mg/L	0.42	0.14
Total Suspended Solids	mg/L	44	30
Bacteria			
Fecal Coliform	MPN/100mL	See Note 8	240
Elements			
Aluminum, total	µg/L	1600	940
Chromium, total	µg/L	7.8	4.5
Copper, total	µg/L	38	20
Iron, total	µg/L	3000	1500
Lead, total	µg/L	5.3	2.8
Zinc, total	µg/L	150	81
Polynuclear Aromatic Hydrocarbons			

Constituent[1]	Units	Event 1/24/2018	Event 3/20/2018
Acenaphthene	ng/L	ND	ND
Acenaphthylene	ng/L	ND	ND
Anthracene	ng/L	ND	ND
Benz(a)anthracene	ng/L	ND	ND
Benzo(a)pyrene	ng/L	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND
Chrysene	ng/L	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND
Fluoranthene	ng/L	ND	ND
Fluorene	ng/L	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND
Naphthalene	ng/L	ND	ND
Phenanthrene	ng/L	ND	ND
Pyrene	ng/L	ND	80.3
Total PAHs	ng/L	ND	80.3

Table 3.43. Results for Tier 1 Project Site 4-406 (Antioch Effluent)

Biofiltration Basin Effluent, Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL

Constituent	Units	Event 1/24/2018	Event 3/20/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
TMDL-Specific Constituents						
Methyl Mercury	ng/L	0.11	0.11	See Notes 1, 2		
Suspended Sediment Concentration	mL/L	60	33			
Total Settleable Solids	mL/L	0.1	ND			
Turbidity	NTU	45	19			
Field Measurements						
pH	pH units	8.41	8.3			6.5 to 8.5
Temperature	°C	12.6	16.4			
Average Flow Rate	gpm	6.3	6.9			
Conventionals						
Hardness as $CaCO_3$	mg/L	54	40			
Nitrate as N	mg/L	0.64	0.36			
Oil & Grease	mg/L	2.7	1.8			
Total Dissolved Solids	mg/L	100	85			
Total Kjeldahl Nitrogen	mg/L	1.4	0.7			
Total Phosphorus	mg/L	0.6	0.16			
Total Suspended Solids	mg/L	40	17			
Bacteria						

Constituent	Units	Event 1/24/2018	Event 3/20/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Fecal Coliform	MPN/100mL	7000	240			
Elements						
Aluminum, total	µg/L	1100	570			
Chromium, total	µg/L	6.3	3.5			
Copper, total	µg/L	27	15		13	
Iron, total	µg/L	1900	910			
Lead, total	µg/L	3.4	1.8		65	
Zinc, total	µg/L	68	55		120	
Toxicity						
Chronic Toxicity, Biomass	P/F	Pass	See Note 9			
Chronic Toxicity, Survival	P/F	Pass	See Note 9			
Polynuclear Aromatic Hydrocarbons						
Acenaphthene	ng/L	ND	ND			
Acenaphthylene	ng/L	ND	ND			
Anthracene	ng/L	ND	ND			
Benz(a)anthracene	ng/L	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND			

Constituent	Units	Event 1/24/2018	Event 3/20/2018	TMDL Limits	Reference Values[3,4] CTR Values	Reference Values[3,4] Basin Plan Values
Chrysene	ng/L	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND			
Fluoranthene	ng/L	ND	ND			
Fluorene	ng/L	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND			
Naphthalene	ng/L	ND	ND			
Phenanthrene	ng/L	ND	ND			
Pyrene	ng/L	ND	34.9			
Total PAHs	ng/L	ND	34.9			

Table 3.40, Table 3.41, Table 3.42, Table 3.43. (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:
1. Sacramento-San Joaquin River Delta Estuary Methylmercury TMDL. There are no waste load allocations specific to Caltrans. However, allocations for each of the defined municipal entities include all current and future permitted discharges within the geographic boundaries of these municipalities and unincorporated areas, including Caltrans.
2. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit. Only results greater than the acute value are highlighted.
3. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
4. See Appendix D, Water Quality Reference Values for TMDL Sites.
5. A lab error resulted in the wrong analytical list being used for this sample. This issue was addressed and we were able to get most of the correct analytes run, but Total Settleable Solids and Turbidity were out of hold and not run.
6. Toxicity species to be used is Fathead minnow. Toxicity samples collected at effluent station, Site 4-406 (Antioch Effluent), only.
7. Field crew inadvertently forget to take a pH and temperature measurement.
8. Constituent list was updated to include fecal coliform after this storm was sampled.
9. Insufficient sample volume for toxicity analysis

Table 3.44. Results for Tier 1 Project Site 7-08 (North Hollywood CSF Inlet)

CSF Influent, Los Angeles River Trash TMDL, Los Angeles River Watershed Bacteria TMDL, Los Angeles River Watershed Metals TMDL

Constituent[1]	Units	Event 3/2/2018	Event 3/10/2018	Event 3/21/2018
TMDL-Specific Constituents				
Cadmium, total	µg/L	0.2	0.1	0.1
Copper, total	µg/L	16	11	8.8
Lead, total	µg/L	8.5	3.8	4.7
Zinc, total	µg/L	120	74	72
E. coli	MPN/100mL	2420	ND	ND
Field Measurements				
pH	pH units	8.3	8.57	8.89
Temperature	°C	11.6	15.9	15.9
Average Flow Rate	gpm	21.7	27.2	53.5
Bacteria				
Fecal Coliform	MPN/100mL	3000	1600	350
Conventionals				
Hardness as $CaCO_3$	mg/L	24	12	10
Nitrate as N	mg/L	ND	0.23	0.16
Oil & Grease	mg/L	2	ND	2
Total Dissolved Solids	mg/L	32	32	24
Total Kjeldahl Nitrogen	mg/L	0.45	1.04	0.61
Total Phosphorus	mg/L	0.29	0.26	0.13
Total Suspended Solids	mg/L	42	14	24
Elements				
Aluminum, total	µg/L	2400	1100	1700
Chromium, total	µg/L	3.5	1.9	2.2
Iron, total	µg/L	990	520	760
Toxicity[6]				
Chronic Toxicity, Biomass	P/F	NS	PASS	FAIL
Chronic Toxicity, Survival	P/F	NS	PASS	PASS

Constituent[1]	Units	Event 3/2/2018	Event 3/10/2018	Event 3/21/2018
Polynuclear Aromatic Hydrocarbons				
Acenaphthene	ng/L	ND	ND	ND
Acenaphthylene	ng/L	ND	ND	ND
Anthracene	ng/L	ND	ND	ND
Benz(a)anthracene	ng/L	ND	ND	ND
Benzo(a)pyrene	ng/L	ND	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND	ND
Chrysene	ng/L	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND	ND
Fluoranthene	ng/L	ND	ND	ND
Fluorene	ng/L	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND
Naphthalene	ng/L	ND	ND	ND
Phenanthrene	ng/L	ND	ND	ND
Pyrene	ng/L	ND	ND	ND
Total PAHs	ng/L	ND	ND	ND

Table 3.45. Results for Tier 1 Project Site 7-09 (North Hollywood CSF Outlet)

CSF Effluent, Los Angeles River Trash TMDL, Los Angeles River Watershed Bacteria TMDL, Los Angeles River Watershed Metals TMDL

Constituent	Units	Event 3/2/2018	Event 3/10/2018	Event 3/21/2018	TMDL Limits	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
TMDL-Specific Constituents							
Cadmium, total	µg/L	0.2	ND	0.1	See Notes 1,3	10.4	
Copper, total	µg/L	19	9.3	9.9	See Notes 1,3	28	
Lead, total	µg/L	7.8	2.8	5.3	See Notes 1,3	209	
Zinc, total	µg/L	140	67	78	See Notes 1,3	224	
E. coli	MPN/100mL	2420	210	ND	See Notes 2,3		
Field Measurements							
pH	pH units	7.64	7.92	8.13			6.5 to 8.5
Temperature	°C	12.1	16.3	16.8			
Average Flow Rate	gpm	21.7	27.2	53.5			
Bacteria							
Fecal Coliform	MPN/100mL	3000	5400	70			
Conventionals							
Hardness as $CaCO_3$	mg/L	72	12	12			
Nitrate as N	mg/L	ND	0.3	0.25			
Oil & Grease	mg/L	2	ND	ND			
Total Dissolved Solids	mg/L	52	28	12			950
Total Kjeldahl Nitrogen	mg/L	0.4	0.82	0.64			

Constituent	Units	Event 3/2/2018	Event 3/10/2018	Event 3/21/2018	TMDL Limits	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
Total Phosphorus	mg/L	0.35	0.23	0.23			
Total Suspended Solids	mg/L	43	10	33			
Elements							
Aluminum, total	µg/L	1700	560	1900			
Chromium, total	µg/L	7.4	1.5	2			
Iron, total	µg/L	1100	310	860			
Toxicity[6]							
Chronic Toxicity, Biomass	P/F	PASS	PASS	PASS			
Chronic Toxicity, Survival	P/F	PASS	PASS	PASS			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			

Constituent	Units	Event 3/2/2018	Event 3/10/2018	Event 3/21/2018	TMDL Limits	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
Fluoranthene	ng/L	ND	ND	ND			
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND			
Naphthalene	ng/L	ND	ND	ND			
Phenanthrene	ng/L	ND	ND	ND			
Pyrene	ng/L	ND	ND	ND			
Total PAHs	ng/L	ND	ND	ND			

Table 3.44, Table 3.45. (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
NS = Not Sampled
Notes:
1. Los Angeles River Watershed Metals TMDL. The TMDL includes wet-weather and dry-weather waste load allocations. The wet-weather allocations are apportioned among stormwater permit holders based on the percent area of the watershed served by storm drains. The mass-based wet-weather allocations are a function of the Water-Effect ratio and the daily volume.
2. Los Angeles River Watershed Bacteria TMDL. The TMDL uses a "reference system/anti-degradation approach" to implement the water quality objectives per the implementation provisions in Chapter 3 of the Basin Plan. A certain number of daily exceedances of the single sample bacteria objectives are permitted. The single sample target for *E. coli* density shall not exceed 235/100 mL.
3. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit. Only results greater than the acute value are highlighted.
4. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
5. See Appendix D, Water Quality Reference Values for TMDL Sites.
6. Toxicity species to be used is Fathead minnow.

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Table 3.46. Results for Tier 1 Project Site 12-254 (1137L Inlet)

Detention Basin with Overflow Operation Influent, San Diego Creek Watershed, Organochlorine Compounds and PCBs TMDL

Constituent	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018
TMDL-Specific Constituents				
Toxaphene	ng/L	ND	ND	ND
DDT				
DDD(o,p')	ng/L	ND	ND	ND
DDD(p,p')	ng/L	ND	ND	ND
DDE(o,p')	ng/L	ND	ND	ND
DDE(p,p')	ng/L	ND	ND	ND
DDT(o,p')	ng/L	ND	ND	ND
DDT(p,p')	ng/L	ND	ND	ND
Field Measurements				
pH	pH units	6.79	6.9	7.37
Temperature	°C	13.1	16	18.6
Average Flow Rate	gpm	12.2	9.9	2.3
Bacteria				
Fecal Coliform	MPN/100mL	130	540	220
Conventionals				
Hardness as $CaCO_3$	mg/L	18	14.7	22.9
Nitrate as N	mg/L	0.642	0.557	1.11
Oil & Grease	mg/L	2.33	3.13	3.78
Total Dissolved Solids	mg/L	58.5	18.5	77.5
Total Kjeldahl Nitrogen	mg/L	2.5	1.4	1.6
Total Phosphorus	mg/L	0.237	0.14	0.171
Total Suspended Solids	mg/L	45.5	36.9	31.9
Elements				
Aluminum, total	µg/L	416	219	411
Chromium, total	µg/L	1.25	0.63	1.83
Copper, total	µg/L	78.3	47.3	78.5

Constituent	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018
Iron, total	µg/L	655	280	611
Lead, total	µg/L	3.34	1.88	2.77
Zinc, total	µg/L	339	184	238
Toxicity[6]				
Chronic Toxicity, Biomass	P/F	FAIL	FAIL	FAIL
Chronic Toxicity, Survival	P/F	FAIL	PASS	FAIL
Polynuclear Aromatic Hydrocarbons				
Acenaphthene	ng/L	ND	3.32	ND
Acenaphthylene	ng/L	8.12	6.32	ND
Anthracene	ng/L	5.81	3.4	ND
Benz(a)anthracene	ng/L	11.8	8.12	ND
Benzo(a)pyrene	ng/L	29.3	17.4	ND
Benzo(b)fluoranthene	ng/L	17.8	74.8	ND
Benzo(g,h,i)perylene	ng/L	66.3	76.8	77.7
Benzo(k)fluoranthene	ng/L	10.8	25.8	ND
Chrysene	ng/L	40.3	27.8	54.1
Dibenz(a,h)anthracene	ng/L	5.32	ND	ND
Fluoranthene	ng/L	48.3	61.1	43.8
Fluorene	ng/L	10.7	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	14.3	19.7	28.3
Naphthalene	ng/L	20.1	14.8	18.9
Phenanthrene	ng/L	33.6	31.9	44.5
Pyrene	ng/L	92.3	141	108

Table 3.47. Results for Tier 1 Project Site 12-255 (1137L Outlet)

Detention Basin with Overflow Operation Effluent, San Diego Creek Watershed, Organochlorine Compounds and PCBs TMDL

Constituent	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
TMDL-Specific Constituents							
Toxaphene	ng/L	ND	ND	ND	See Notes 1,3	730	
DDT							
DDD(o,p')	ng/L	ND	ND	ND	See Notes 1,3		
DDD(p,p')	ng/L	ND	ND	ND	See Notes 1,3		
DDE(o,p')	ng/L	ND	ND	ND	See Notes 1,3		
DDE(p,p')	ng/L	ND	ND	ND	See Notes 1,3		
DDT(o,p')	ng/L	ND	ND	ND	See Notes 1,3		
DDT(p,p')	ng/L	ND	ND	ND	See Notes 1,3	1,100	
Field Measurements							
pH	pH units	5.76	6.7	7.44			6.5 to 8.5
Temperature	°C	12.8	15.9	18.9			
Average Flow Rate	gpm	8.4	3.6	0.89			
Bacteria							
Fecal Coliform	MPN/100mL	350	ND	240			
Conventionals							
Hardness as $CaCO_3$	mg/L	17.2	11.1	29.4			
Nitrate as N	mg/L	0.506	0.307	1.01			

Constituent	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
Oil & Grease	mg/L	1.96	2.81	3.14			
Total Dissolved Solids	mg/L	57.5	16.5	89.5			1500
Total Kjeldahl Nitrogen	mg/L	2.3	0.815	1.2			
Total Phosphorus	mg/L	0.244	0.0996	0.184			
Total Suspended Solids	mg/L	35.9	15.1	18.1			
Elements							
Aluminum, total	µg/L	374	125	333			
Chromium, total	µg/L	1.3	0.544	1.9			
Copper, total	µg/L	65.8	30.5	73.8		31.4	
Iron, total	µg/L	587	181	514			
Lead, total	µg/L	3.31	1.08	2.16		244	
Zinc, total	µg/L	334	131	313		248	
Toxicity[6]							
Chronic Toxicity, Biomass	P/F	FAIL	FAIL	FAIL			
Chronic Toxicity, Survival	P/F	FAIL	PASS	FAIL			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	5.51	2.7	ND			
Anthracene	ng/L	5.75	1.38	ND			
Benz(a)anthracene	ng/L	9.13	3.14	ND			

Constituent	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
Benzo(a)pyrene	ng/L	21.1	6.79	ND			
Benzo(b)fluoranthene	ng/L	13.9	40.3	ND			
Benzo(g,h,i)perylene	ng/L	43.7	29.9	ND			
Benzo(k)fluoranthene	ng/L	9.25	10.5	ND			
Chrysene	ng/L	29.7	11.3	45.2			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	38.6	24.3	26.6			
Fluorene	ng/L	7.86	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	10.7	ND	ND			
Naphthalene	ng/L	14.6	7.13	22.1			
Phenanthrene	ng/L	27	13.1	22.2			
Pyrene	ng/L	64.5	56.5	51.9			

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Table 3.48. Results for Tier 1 Project Site 12-257 (1143L Inlet)

Detention Basin with Overflow Operation Influent, San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) / Cadmium TMDL

Constituent[1]	Units	Event 2/27/2018	Event 3/11/2018	Event 3/23/2018
TMDL Specific Constituents				
Copper, dissolved	µg/L	17.8	14.6	45.8
Lead, dissolved	µg/L	ND	ND	0.0503
Zinc, dissolved	µg/L	45.1	44.7	66.6
Cadmium, dissolved	µg/L	ND	ND	0.0286
Field Measurements				
pH	pH units	6.15	6.6	7.76
Temperature	°C	12.5	15.8	17.8
Average Flow Rate	gpm	2.6	2.5	0.58
Bacteria				
Fecal Coliform	MPN/100mL	23	540	ND
Conventionals				
Hardness as CaCO3	mg/L	62.2	28.7	22.5
Nitrate as N	mg/L	1.53	1.27	0.743
Oil & Grease	mg/L	ND	ND	1.46
Total Dissolved Solids	mg/L	116	58	65.5
Total Kjeldahl Nitrogen	mg/L	2.9	1.5	1.2
Total Phosphorus	mg/L	0.648	0.265	0.504
Total Suspended Solids	mg/L	166	39.1	16.9
Elements				
Aluminum, total	µg/L	1610	273	417
Chromium, total	µg/L	6.41	0.624	1.34
Copper, total	µg/L	36.2	22.4	52.3
Iron, total	µg/L	1770	298	532
Lead, total	µg/L	4.55	0.73	0.96
Zinc, total	µg/L	183	80.7	87.7
Toxicity				

Constituent[1]	Units	Event 2/27/2018	Event 3/11/2018	Event 3/23/2018
Chronic Toxicity, Biomass	P/F	PASS	PASS	PASS
Chronic Toxicity, Survival	P/F	PASS	PASS	PASS
Polynuclear Aromatic Hydrocarbons				
Acenaphthene	ng/L	ND	2.26	ND
Acenaphthylene	ng/L	8.29	1.33	ND
Anthracene	ng/L	6.19	ND	ND
Benz(a)anthracene	ng/L	23.7	1.77	ND
Benzo(a)pyrene	ng/L	50	3.67	ND
Benzo(b)fluoranthene	ng/L	35.5	8.19	ND
Benzo(g,h,i)perylene	ng/L	98.1	13.7	ND
Benzo(k)fluoranthene	ng/L	26.6	3.92	ND
Chrysene	ng/L	59.5	7.23	ND
Dibenz(a,h)anthracene	ng/L	9.48	ND	ND
Fluoranthene	ng/L	84.4	14.1	5.3
Fluorene	ng/L	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	28.2	6.28	ND
Naphthalene	ng/L	22.9	4.95	9.3
Phenanthrene	ng/L	59.9	9.65	10.2
Pyrene	ng/L	131	28.1	11.3

Table 3.49. Results for Tier 1 Project Site 12-258 (1143L Outlet)

Detention Basin with Overflow Operation Effluent, San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) / Cadmium TMDL

Constituent[1]	Units	Event 2/27/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits	Reference Values[6] CTR Values[5]	Reference Values[6] Basin Plan Values
TMDL Specific Constituents							
Copper, dissolved	µg/L	30.3	14.5	40.3	49.6/30.1/40.5	30.2	
Lead, dissolved	µg/L	ND	ND	0.0769	280/162/225	162	
Zinc, dissolved	µg/L	137	50.2	94.1	379/242/316	243	
Cadmium, dissolved	µg/L	ND	ND	0.045	19.1/10.8/15.1	10.8	
Field Measurements							
pH	pH units	6.04	6.6	7.37			6.5 to 8.5
Temperature	°C	12.9	16.3	18.7			
Average Flow Rate	gpm	2.5	1.65	0.4			
Bacteria							
Fecal Coliform	MPN/100mL	130	ND	ND			
Conventionals							
Hardness as CaCO3	mg/L	50.6	29.1	24.1			
Nitrate as N	mg/L	2.2	1.22	0.679			
Oil & Grease	mg/L	ND	ND	1.39			
Total Dissolved Solids	mg/L	124	49.5	69.5			1500
Total Kjeldahl Nitrogen	mg/L	3.3	1.1	1.1			
Total Phosphorus	mg/L	0.455	0.233	0.496			

Constituent[1]	Units	Event 2/27/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits	Reference Values[6] CTR Values[5]	Reference Values[6] Basin Plan Values
Total Suspended Solids	mg/L	44.6	22.7	14.7			
Elements							
Aluminum, total	µg/L	567	426	375			
Chromium, total	µg/L	1.68	1.08	1.67		3508	
Copper, total	µg/L	38.4	19.5	44.7		31.4	
Iron, total	µg/L	752	414	499			
Lead, total	µg/L	1.5	0.785	0.878		244	
Zinc, total	µg/L	187	82.1	118		248	
Toxicity							
Chronic Toxicity, Biomass	P/F	NSG	NSG	NSG			
Chronic Toxicity, Survival	P/F	PASS	PASS	PASS			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	2.76	1.13	ND			
Benzo(a)pyrene	ng/L	6.92	ND	ND			
Benzo(b)fluoranthene	ng/L	5.24	ND	ND			
Benzo(g,h,i)perylene	ng/L	13.9	8.51	ND			
Benzo(k)fluoranthene	ng/L	4.33	ND	ND			

Constituent[1]	Units	Event 2/27/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits	Reference Values[6] CTR Values[5]	Reference Values[6] Basin Plan Values
Chrysene	ng/L	10.2	5.32	ND			
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	12.7	8.43	5.4			
Fluorene	ng/L	ND	ND	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	5.44	ND	ND			
Naphthalene	ng/L	7.78	3.55	9.2			
Phenanthrene	ng/L	11.6	6.12	9.1			
Pyrene	ng/L	19.6	17.8	12.1			

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Table 3.50. Results for Tier 1 Project Site 12-329 (1149L Inlet)

Bioretention Influent, San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) TMDL

Constituent[1]	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018
TMDL-Specific Constituents				
Copper, dissolved	µg/L	71.8	38.5	87.2
Lead, dissolved	µg/L	ND	ND	0.153
Zinc, dissolved	µg/L	270	133	209
Field Measurements				
pH	pH units	6.3	7.3	7.8
Temperature	°C	11.6	16.1	15.6
Average Flow Rate	gpm	58	28	6.3
Bacteria				
Fecal Coliform	MPN/100mL	1700	ND	1600
Conventionals				
Hardness as $CaCO_3$	mg/L	19.9	15.8	27.1
Nitrate as N	mg/L	0.735	0.434	0.956
Oil & Grease	mg/L	3	5.05	6.02
Total Dissolved Solids	mg/L	63	53	90
Total Kjeldahl Nitrogen	mg/L	4.2	1.7	2.5
Total Phosphorus	mg/L	0.373	0.159	0.224
Total Suspended Solids	mg/L	122	41.9	62.2
Elements				
Aluminum, total	µg/L	837	382	866
Chromium, total	µg/L	2.95	1.63	4.08
Copper, total	µg/L	152	76.9	133
Iron, total	µg/L	1560	581	1340
Lead, total	µg/L	4.73	3.46	4.65
Zinc, total	µg/L	460	244	311
Toxicity[6]				
Chronic Toxicity, Biomass	P/F	FAIL	FAIL	FAIL

Constituent[1]	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018
Chronic Toxicity, Survival	P/F	FAIL	PASS	PASS
Polynuclear Aromatic Hydrocarbons				
Acenaphthene	ng/L	ND	4.16	ND
Acenaphthylene	ng/L	16.2	8.28	13.6
Anthracene	ng/L	12.4	4.94	ND
Benz(a)anthracene	ng/L	31.2	9.87	46.9
Benzo(a)pyrene	ng/L	83.7	23.9	43.2
Benzo(b)fluoranthene	ng/L	50.2	89.1	57.4
Benzo(g,h,i)perylene	ng/L	181	122	107
Benzo(k)fluoranthene	ng/L	28	36.2	60.1
Chrysene	ng/L	122	42.2	175
Dibenz(a,h)anthracene	ng/L	11.3	ND	ND
Fluoranthene	ng/L	153	94.9	78.1
Fluorene	ng/L	ND	7.41	ND
Indeno(1,2,3-c,d)pyrene	ng/L	37.6	40.7	ND
Naphthalene	ng/L	54.7	19.6	45.1
Phenanthrene	ng/L	96.7	56.7	83.8
Pyrene	ng/L	304	213	139

Table 3.51. Results for Tier 1 Project Site 12-330 (1149L Outlet)

Bioretention Effluent, San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) TMDL

Constituent	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits[2]	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
TMDL-Specific Constituents							
Copper, dissolved	µg/L	15.9	12.6	14.5	40.5/30.1/40.5	30.2	
Lead, dissolved	µg/L	ND	ND	ND	225/162/225	162	
Zinc, dissolved	µg/L	5.76	4.89	6.18	316/242/316	243	
Field Measurements							
pH	pH units	6.12	6.8	7.21			6.5 to 8.5
Temperature	°C	13.7	15.7	14.1			
Average Flow Rate	gpm	7.4	12.2	2.1			
Bacteria							
Fecal Coliform	MPN/100mL	540	ND	540			
Conventionals							
Hardness as $CaCO_3$	mg/L	149	120	137			
Nitrate as N	mg/L	11.3	4.96	2.11			
Oil & Grease	mg/L	ND	ND	ND			
Total Dissolved Solids	mg/L	244	207	210			1500
Total Kjeldahl Nitrogen	mg/L	1.7	0.868	0.331			
Total Phosphorus	mg/L	0.189	0.159	0.151			
Total Suspended Solids	mg/L	6.77	6.48	1.26			

Constituent	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits[2]	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
Elements							
Aluminum, total	µg/L	179	106	76.4			
Chromium, total	µg/L	0.708	0.571	0.761			
Copper, total	µg/L	17.2	13.6	15.4		31.4	
Iron, total	µg/L	258	151	92.8			
Lead, total	µg/L	0.0153	ND	0.116		244	
Zinc, total	µg/L	7.45	7.04	7.64		248	
Toxicity[6]							
Chronic Toxicity, Biomass	P/F	PASS	PASS	PASS			
Chronic Toxicity, Survival	P/F	PASS	PASS	PASS			
Polynuclear Aromatic Hydrocarbons							
Acenaphthene	ng/L	ND	ND	ND			
Acenaphthylene	ng/L	ND	ND	ND			
Anthracene	ng/L	ND	ND	ND			
Benz(a)anthracene	ng/L	ND	ND	ND			
Benzo(a)pyrene	ng/L	ND	ND	ND			
Benzo(b)fluoranthene	ng/L	ND	ND	ND			
Benzo(g,h,i)perylene	ng/L	ND	ND	ND			
Benzo(k)fluoranthene	ng/L	ND	ND	ND			
Chrysene	ng/L	ND	ND	ND			

Constituent	Units	Event 2/26/2018	Event 3/10/2018	Event 3/22/2018	TMDL Limits[2]	Reference Values[4,5] CTR Values	Reference Values[4,5] Basin Plan Values
Dibenz(a,h)anthracene	ng/L	ND	ND	ND			
Fluoranthene	ng/L	ND	1.87	ND			
Fluorene	ng/L	ND	3.53	ND			
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND			
Naphthalene	ng/L	2.96	3.43	4.4			
Phenanthrene	ng/L	ND	1.1	ND			
Pyrene	ng/L	ND	1.02	ND			

Table 3.46, Table 3.47, Table 3.48, Table 3.49, Table 3.50, Table 3.51. (cont'd)

Abbreviations and Acronyms:
P/F = Pass/Fail
ND = Non-detect
Notes:

1. San Diego Creek Watershed, Organochlorine Compounds and PCBs TMDLs. The waste load allocations for Total DDT, Chlordane, Total PCBs, and Toxaphene are 39.2 gm/yr, 25.2 gm/yr, 12.4 gm/yr and 0.6 gm/yr, respectively. However, based on Resolution No. RS-2011-0037 both chlordane and PCBs are now informational TMDLs with no associated waste load allocations.
2. San Diego Creek and Newport Bay Toxics TMDL. Waste load allocations for cadmium, copper, lead, and zinc based on receiving water flow. For each of the three events the associated TMDL limit is listed in order separated by forward slashes.
3. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit. Only results greater than the acute value are highlighted.
4. CTR metals objectives based on hardness of receiving water. Hardness cap of 400 mg/L used as required in CTR. For water bodies classified as estuarine, most stringent of freshwater and saltwater criteria selected. Basin Plan acute values are presented in the table.
5. See Appendix D–Water Quality Reference Values for TMDL Sites.
6. Toxicity species to be used is Fathead minnow.
7. Source of San Diego Creek Receiving Water Flow: Habben, Jamie. "RE: San Diego Creek, Question." Message to Joel Shinneman. September 12, 2018. Email.

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3.2.4 BMP Pilot Project Sites

Table 3.53 through Table 3.57 present the monitoring results for the BMP Pilot Project sites. For the 2014–15 MRR, if a field duplicate was collected for a storm event, the results presented in the data tables were the average of the original sample and duplicate sample. For the 2015–16, 2016–17, and 2017–18 MRRs, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix A. These BMP studies are in progress. The results will be compared to TMDL targets after the monitoring is completed.

Table 3.52. BMP Pilot Project Sites

Site ID	Site Name	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
3-213	EOP Station	Note 2	✓	✓	✓	✓
3-390	BMP1 Effluent	✓	✓	✓	✓	✓
3-393	BMP3 Effluent	Note 2	✓	✓	✓	✓
3-394	BMP4 Effluent	Note 2	✓	✓	✓	✓
3-395	BMP5 Effluent	✓	✓	✓	✓	✓
7-394[1]	Media Filter Drain (Effluent)					
7-395[1]	EOP - Influent					
7-396[1]	Linear Sand Filter 5A (Effluent)					
7-397[1]	Linear Filtration Trench (Effluent)					
7-398[1]	Linear Sand Filter 5 (Effluent)					

Notes:

1. No storm events were sampled at the District 7 BMP Pilot Project sites. The sites had to be maintained to address clogging issues. No qualifying storm events occurred after the repair work was completed in March 2018.
2. 1/8/18 Event, composite sampling failed, only grab samples were submitted for analysis.

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Table 3.53. Results for BMP Pilot Project Site 3-213 (EOP Station)

Constituent	Units	Event 1/8/2018[1]	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Field Measurements						
pH	pH units	8.27	9.11	7.95	8.7	8.98
Specific Conductivity	µS/cm	85.3	120.6	237.9	83.1	108.6
Temperature	°C	12.5	10.7	14.8	13	15.6
Turbidity	NTU	NS	136	103	32.7	212
Average Flow Rate	gpm	6.0	3.0	1.7	3.8	3.3
Conventionals						
Hardness as $CaCO_3$	mg/L	NS	48	76	30	48
Nitrate as N	mg/L	NS	0.52	1.3	0.34	0.37
Nitrite as N	mg/L	NS	0.075	0.19	0.047	0.071
Oil & Grease	mg/L	1.9	2.2	8.1	3.7	2.4
Total Dissolved Solids	mg/L	NS	70	190	38	48
Total Kjeldahl Nitrogen	mg/L	NS	1.8	2.6	0.97	1.1
Total Phosphorus	mg/L	NS	0.31	0.33	0.16	0.15
Dissolved Phosphorus	mg/L	NS	0.11	0.13	0.064	NS
Total Suspended Solids	mg/L	NS	136	104	26	66
Total Nitrogen	mg/L	NS	2.4	4.1	1.4	1.5
OrthoPhosphate as P	mg/L	NS	0.068	0.091	0.05	0.055
Elements						
Methyl Mercury	ng/L	0.03	0.14	0.19	0.1	0.09
Aluminum, total	µg/L	NS	3600	3000	1200	1900
Chromium, total	µg/L	NS	11	8.9	4.7	7.7
Copper, total	µg/L	NS	33	60	18	27
Iron, total	µg/L	NS	4.6	3.7	1.7	2.8
Lead, total	µg/L	NS	5.9	17	5.3	5.1
Zinc, total	µg/L	NS	170	280	86	110
Chromium, dissolved	µg/L	NS	1.3	1.5	0.85	1.4
Copper, dissolved	µg/L	NS	6.7	21	5.4	8.8

Constituent	Units	Event 1/8/2018[1]	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Lead, dissolved	µg/L	NS	0.18	0.5	0.15	0.18
Zinc, dissolved	µg/L	NS	130	190	77	100

Table 3.54. Results for BMP Pilot Project Site 3-390 (BMP1 Effluent)

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Field Measurements						
pH	pH units	7.83	8.14	8.21	8.04	8.35
Specific Conductivity	µS/cm	238.7	254.1	345.5	215	185.1
Temperature	°C	12.7	11.4	14.7	13.1	15.5
Turbidity	NTU	NS	11.8	8.6	8.7	9.34
Average Flow Rate	gpm	3.2	1.3	0.45	2.1	1.6
Conventionals						
Hardness as $CaCO_3$	mg/L	78	82	94	60	60
Nitrate as N	mg/L	6.2	4.6	7.3	2.3	3.6
Nitrite as N	mg/L	0.049	0.076	0.053	0.019	0.035
Oil & Grease	mg/L	ND	ND	1.7	ND	1.7
Total Dissolved Solids	mg/L	150	160	190	120	100
Total Kjeldahl Nitrogen	mg/L	1.3	1.1	1.1	0.79	0.88
Total Phosphorus	mg/L	0.42	0.45	0.41	0.32	0.35
Dissolved Phosphorus	mg/L	0.41	0.42	0.38	0.29	NS
Total Suspended Solids	mg/L	2	5	3	2	3
Total Nitrogen	mg/L	7.5	5.8	8.5	3.1	4.5
OrthoPhosphate as P	mg/L	0.38	0.37	0.35	0.27	0.29
Bacteria						
Fecal Coliform	MPN/100mL	240	540	540	700	2600
Elements						
Methyl Mercury	ng/L	0.1	0.11	0.14	0.12	0.14
Aluminum, total	µg/L	220	190	180	140	140
Chromium, total	µg/L	3.7	4.2	7.5	4.8	5.1
Copper, total	µg/L	13	17	17	11	15
Iron, total	mg/L	0.42	0.35	0.35	0.29	0.39
Lead, total	µg/L	0.37	0.31	0.3	0.26	0.34
Zinc, total	µg/L	8.6	7.9	8.3	5.9	8.7

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Chromium, dissolved	µg/L	2.7	3.6	6.7	4.1	3.8
Copper, dissolved	µg/L	11	15	17	9	12
Lead, dissolved	µg/L	ND	ND	0.15	ND	0.08
Zinc, dissolved	µg/L	3.2	81	10	49	64
Toxicity						
Chronic Toxicity, Biomass	P/F	Pass	Pass	Pass	Pass	Pass
Chronic Toxicity, Survival	P/F	Pass	Pass	Pass	Pass	Pass
Polynuclear Aromatic Hydrocarbons						
Acenaphthene	ng/L	ND	ND	ND	ND	ND
Acenaphthylene	ng/L	ND	ND	ND	ND	ND
Anthracene	ng/L	ND	ND	ND	ND	ND
Benz(a)anthracene	ng/L	ND	ND	ND	ND	ND
Benzo(a)pyrene	ng/L	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND	ND	ND	ND
Chrysene	ng/L	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND	ND	ND	ND
Fluoranthene	ng/L	ND	ND	ND	ND	ND
Fluorene	ng/L	ND	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND	ND	ND
Naphthalene	ng/L	ND	ND	ND	ND	ND
Phenanthrene	ng/L	ND	ND	ND	ND	ND
Pyrene	ng/L	ND	ND	ND	ND	ND
Total PAHs	ng/L	ND	ND	ND	ND	ND

Table 3.55. Results for BMP Pilot Project Site 3-393 (BMP3 Effluent)

Constituent	Units	Event 1/8/2018[1]	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Field Measurements						
pH	pH units	8.35	8.4	8.27	8.3	8.35
Specific Conductivity	µS/cm	144.9	197.3	286.7	123.9	179.5
Temperature	°C	12.7	10.7	14.5	12.7	15.7
Turbidity	NTU	NS	13.1	10.9	6.91	8.18
Average Flow Rate	gpm	6.1	2.1	0.48	2.3	1.7
Conventionals						
Hardness as $CaCO_3$	mg/L	NS	70	100	68	70
Nitrate as N	mg/L	NS	1.8	4.1	1.1	1.9
Nitrite as N	mg/L	NS	0.069	0.057	0.016	0.028
Oil & Grease	mg/L	ND	ND	1.9	ND	ND
Total Dissolved Solids	mg/L	NS	120	130	96	81
Total Kjeldahl Nitrogen	mg/L	NS	0.75	0.75	0.22	0.57
Total Phosphorus	mg/L	NS	0.15	0.12	0.14	0.15
Dissolved Phosphorus	mg/L	NS	0.14	0.11	0.13	NS
Total Suspended Solids	mg/L	NS	4	4	2	2
Total Nitrogen	mg/L	NS	2.6	4.9	1.3	2.5
OrthoPhosphate as P	mg/L	NS	0.12	0.097	0.11	0.11
Bacteria						
Fecal Coliform	MPN/100mL	400	540	79	13	1700
Elements						
Methyl Mercury	ng/L	0.21	0.16	0.25	0.18	0.23
Aluminum, total	µg/L	NS	230	120	140	130
Chromium, total	µg/L	NS	2.1	2.4	1.6	2.4
Copper, total	µg/L	NS	6.2	7.4	4.3	7.4
Iron, total	mg/L	NS	0.35	0.24	0.25	0.29
Lead, total	µg/L	NS	0.44	0.37	0.25	0.32
Zinc, total	µg/L	NS	9.3	7.5	4.3	6.7

Constituent	Units	Event 1/8/2018[1]	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Chromium, dissolved	µg/L	NS	1.4	1.9	1.1	1.5
Copper, dissolved	µg/L	NS	5	6.8	3.8	5.9
Lead, dissolved	µg/L	NS	0.07	0.09	ND	0.08
Zinc, dissolved	µg/L	NS	64	50	41	51
Toxicity						
Chronic Toxicity, Biomass	P/F	NS	Pass	Pass	Pass	Pass
Chronic Toxicity, Survival	P/F	NS	Pass	Pass	Pass	Pass
Polynuclear Aromatic Hydrocarbons						
Acenaphthene	ng/L	NS	ND	ND	ND	ND
Acenaphthylene	ng/L	NS	ND	ND	ND	ND
Anthracene	ng/L	NS	ND	ND	ND	ND
Benz(a)anthracene	ng/L	NS	ND	ND	ND	ND
Benzo(a)pyrene	ng/L	NS	ND	ND	ND	ND
Benzo(b)fluoranthene	ng/L	NS	ND	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	NS	ND	ND	ND	ND
Benzo(k)fluoranthene	ng/L	NS	ND	ND	ND	ND
Chrysene	ng/L	NS	ND	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	NS	ND	ND	ND	ND
Fluoranthene	ng/L	NS	ND	ND	ND	ND
Fluorene	ng/L	NS	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	NS	ND	ND	ND	ND
Naphthalene	ng/L	NS	ND	ND	ND	ND
Phenanthrene	ng/L	NS	ND	ND	ND	ND
Pyrene	ng/L	NS	ND	ND	ND	ND
Total PAHs	ng/L	NA	ND	ND	ND	ND

Table 3.56. Results for BMP Pilot Project Site 3-394 (BMP4 Effluent)

Constituent	Units	Event 1/8/2018[1]	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Field Measurements						
pH	pH units	7.77	8.45	8.1	NS	8.06
Specific Conductivity	µS/cm	165.1	179.2	269	NS	159.6
Temperature	°C	12.5	10.9	14.7	12.7	15.7
Turbidity	NTU	NS	63.5	34.4	NS	29.2
Average Flow Rate	gpm	3.8	2.6	0.44	2.3	1.8
Conventionals						
Hardness as $CaCO_3$	mg/L	NS	62	96	NS	60
Nitrate as N	mg/L	NS	1	1.9	NS	1.1
Nitrite as N	mg/L	NS	0.062	0.072	NS	0.032
Oil & Grease	mg/L	ND	1.9	1.9	ND	ND
Total Dissolved Solids	mg/L	NS	130	170	NS	81
Total Kjeldahl Nitrogen	mg/L	NS	0.26	1.1	NS	1
Total Phosphorus	mg/L	NS	0.33	0.26	NS	0.27
Dissolved Phosphorus	mg/L	NS	0.23	0.18	NS	NS
Total Suspended Solids	mg/L	NS	24	16	NS	12
Total Nitrogen	mg/L	NS	1.3	3.1	NS	2.1
OrthoPhosphate as P	mg/L	NS	0.19	0.15	NS	0.17
Bacteria						
Fecal Coliform	MPN/100mL	240	700	240	70	7000
Elements						
Methyl Mercury	ng/L	0.06	0.09	0.1	0.08	0.08
Aluminum, total	µg/L	NS	1500	930	NS	670
Chromium, total	µg/L	NS	5.7	5.1	NS	4.3
Copper, total	µg/L	NS	14	12	NS	12
Iron, total	mg/L	NS	1.8	1.2	NS	1
Lead, total	µg/L	NS	1.9	1.1	NS	0.94
Zinc, total	µg/L	NS	27	17	NS	13

Constituent	Units	Event 1/8/2018[1]	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Chromium, dissolved	µg/L	NS	2	2.7	NS	2
Copper, dissolved	µg/L	NS	7.8	9.9	NS	8.5
Lead, dissolved	µg/L	NS	0.21	0.23	NS	0.21
Zinc, dissolved	µg/L	NS	190	100	NS	97
Toxicity						
Chronic Toxicity, Biomass	P/F	NS	Pass	Pass	NS	Pass
Chronic Toxicity, Survival	P/F	NS	Pass	Pass	NS	Pass
Polynuclear Aromatic Hydrocarbons						
Acenaphthene	ng/L	NS	ND	ND	NS	ND
Acenaphthylene	ng/L	NS	ND	ND	NS	ND
Anthracene	ng/L	NS	ND	ND	NS	ND
Benz(a)anthracene	ng/L	NS	ND	ND	NS	ND
Benzo(a)pyrene	ng/L	NS	ND	ND	NS	ND
Benzo(b)fluoranthene	ng/L	NS	ND	ND	NS	ND
Benzo(g,h,i)perylene	ng/L	NS	ND	ND	NS	ND
Benzo(k)fluoranthene	ng/L	NS	ND	ND	NS	ND
Chrysene	ng/L	NS	ND	ND	NS	ND
Dibenz(a,h)anthracene	ng/L	NS	ND	ND	NS	ND
Fluoranthene	ng/L	NS	ND	ND	NS	ND
Fluorene	ng/L	NS	ND	ND	NS	ND
Indeno(1,2,3-c,d)pyrene	ng/L	NS	ND	ND	NS	ND
Naphthalene	ng/L	NS	ND	ND	NS	ND
Phenanthrene	ng/L	NS	ND	ND	NS	ND
Pyrene	ng/L	NS	ND	ND	NS	ND
Total PAHs	ng/L	NA	ND	ND	NS	ND

Table 3.57. Results for BMP Pilot Project Site 3-395 (BMP5 Effluent)

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Field Measurements						
pH	pH units	7.56	8.48	7.75	8.11	8.08
Specific Conductivity	µS/cm	104.4	148.3	222.8	105.7	129.1
Temperature	°C	12.9	11.2	14.4	12.6	15.8
Turbidity	NTU	NS	17.2	8.91	15	11.1
Average Flow Rate	gpm	6.1	2.6	0.65	2.8	1.8
Conventionals						
Hardness as $CaCO_3$	mg/L	34	42	66	38	48
Nitrate as N	mg/L	1.5	1.8	3.9	1.1	2.1
Nitrite as N	mg/L	0.054	0.11	0.042	0.009	0.022
Oil & Grease	mg/L	ND	ND	2.1	ND	ND
Total Dissolved Solids	mg/L	53	87	110	71	57
Total Kjeldahl Nitrogen	mg/L	0.44	0.53	0.35	0.35	0.57
Total Phosphorus	mg/L	3	4	3	3	3
Dissolved Phosphorus	mg/L	0.15	0.14	0.1	0.12	0.14
Total Suspended Solids	mg/L	0.15	0.12	0.09	0.11	NS
Total Nitrogen	mg/L	2	2.4	4.3	1.5	2.7
OrthoPhosphate as P	mg/L	0.15	0.099	0.085	0.092	0.11
Bacteria						
Fecal Coliform	MPN/100mL	220	210	130	140	2400
Elements						
Methyl Mercury	ng/L	0.09	0.07	0.08	0.09	0.1
Aluminum, total	µg/L	400	280	140	230	200
Chromium, total	µg/L	1.9	2.2	1.5	1.5	2
Copper, total	µg/L	6.9	8.5	8.8	6.1	8.8
Iron, total	mg/L	0.55	0.37	0.22	0.34	0.33
Lead, total	µg/L	0.45	0.42	0.18	0.24	0.24
Zinc, total	µg/L	7.6	7.5	4.2	3.7	4.2

Constituent	Units	Event 1/8/2018	Event 3/1/2018	Event 3/13/2018	Event 3/21/2018	Event 4/6/2018
Chromium, dissolved	µg/L	0.66	1.3	1.1	0.74	1.2
Copper, dissolved	µg/L	4.9	6.2	8.5	5.2	7.4
Lead, dissolved	µg/L	0.06	0.08	ND	ND	0.07
Zinc, dissolved	µg/L	2.1	74	53	89	52
Toxicity						
Chronic Toxicity, Biomass	P/F	Pass	Pass	Pass	Pass	Pass
Chronic Toxicity, Survival	P/F	Pass	Pass	Pass	Pass	Pass
Polynuclear Aromatic Hydrocarbons						
Acenaphthene	ng/L	ND	ND	ND	ND	ND
Acenaphthylene	ng/L	ND	ND	ND	ND	ND
Anthracene	ng/L	ND	ND	ND	ND	ND
Benz(a)anthracene	ng/L	ND	ND	ND	ND	ND
Benzo(a)pyrene	ng/L	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ng/L	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ng/L	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ng/L	ND	ND	ND	ND	ND
Chrysene	ng/L	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ng/L	ND	ND	ND	ND	ND
Fluoranthene	ng/L	ND	ND	ND	ND	ND
Fluorene	ng/L	ND	ND	ND	ND	ND
Indeno(1,2,3-c,d)pyrene	ng/L	ND	ND	ND	ND	ND
Naphthalene	ng/L	ND	ND	ND	ND	ND
Phenanthrene	ng/L	ND	ND	ND	ND	ND
Pyrene	ng/L	ND	ND	ND	ND	ND
Total PAHs	ng/L	ND	ND	ND	ND	ND

Table 3.53, Table 3.54, Table 3.55, Table 3.56, Table 3.57 (Cont'd)

Abbreviations and Acronyms:

P/F = Pass/Fail

ND = Non-detect

NS = Not Sampled

1. Composite sampling failed, only grab samples were submitted for analysis

Section 4
TIER 2 MONITORING

{No Tier 2 sites were monitored during the 2017–18 wet season.}

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Section 5
CORRECTIVE ACTIONS

5.1 ASBS SITES

The state is divided into three regions for ASBS monitoring—each region has a distinct set of NWQ values for the ocean receiving waters. The NWQ values and the comparisons of water quality results to NWQ values are presented in Section 2.3. Table 5.01 lists the constituents that exceed natural water quality, by ASBS, that have been identified to date.

Table 5.01. ASBS Exceedances to Date

ASBS	ORW Site ID	Constituents that Exceed Natural Water Quality (to Date)
ASBS 05 (Saunders)	1-338	None
ASBS 08 (Redwoods)	1-323	Total Suspended Solids, Arsenic, Copper, Lead, Mercury, Nickel, Selenium
ASBS 09 (Fitzgerald)	4-342	Dissolved Orthophosphate, Total Suspended Solids, Copper, Lead, Zinc, Toxicity
ASBS 15 (Ano Nuevo)	4-346	Fecal Coliform, Enterococcus, Total Suspended Solids, Oil & Grease, Nitrate, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc
ASBS 34 (Carmel Bay)	5-305	Cadmium, Lead, Mercury, Zinc
ASBS 24 (Laguna to Latigo)	7-407	Ammonia, Selenium, PAHs
ASBS 33 (Irvine Coast)	12-351	See Note 1

Notes:

1. In the 2015–16 MRR, selenium and copper were listed as constituents that exceeded NWQ values in ASBS 33. During the 2016–17 wet season, Caltrans determined that, with one exception, it no longer has direct discharges to the ASBS.

5.1.1 ASBS 05

Nine storm events have been captured to date in ASBS 05, and no exceedances have been identified. Caltrans has requested release from monitoring requirements in ASBS 05. The State Water Board has suspended monitoring pending a review of the water quality data.

5.1.2 ASBS 08

Six storm events have been captured to date in ASBS 08, and seven exceedances have been identified. Caltrans has requested release from monitoring requirements in ASBS 08. The State Water Board has suspended monitoring pending a review of the water quality data.

5.1.3 ASBS 09

Nine storm events have been captured to date in ASBS 09, and six exceedances have been identified. Caltrans has requested release from monitoring requirements in ASBS 09. The State Water Board has suspended monitoring pending a review of the water quality data.

5.1.4 ASBS 15

Eight storm events have been captured to date in ASBS 15, and thirteen exceedances have been identified. Caltrans has requested release from monitoring requirements in ASBS 15. The State Water Board has suspended monitoring pending a review of the water quality data.

5.1.5 ASBS 34

Six storm events have been captured to date in ASBS 34, and four exceedances have been identified. Caltrans has requested release from monitoring requirements in ASBS 34. The State Water Board has suspended monitoring pending a review of the water quality data.

5.1.6 ASBS 24

Seven storm events have been captured to date in ASBS 24, and three exceedances have been identified. The required number of storm events per the special protections have been

collected. Caltrans has requested the State Water Board for suspension of monitoring pending evaluation of monitoring data by the State Water Board.

5.1.7 ASBS 33

Fifteen storm events have been captured to date in ASBS 33. During the 2016–17 wet season, Caltrans conducted additional investigations of the monitoring sites. Caltrans determined that, with one exception, its outfalls do not directly drain to the ASBS. Stormwater BMPs to be implemented in ASBS 33 are described in the Caltrans ASBS Compliance Plan. The State Water Board issued a letter to Caltrans releasing Caltrans from monitoring requirements in this ASBS, the letter is provided in Appendix E. A bioswale BMP retrofit project in ASBS 33 is scheduled to begin October 2018.

5.2 TMDL SITES

The next steps for TMDL sites, including the TMDL monitoring projects on hold discussed in Section 3.1.3, are described below by TMDL Project.

5.2.1 Chollas Creek Project

Caltrans has constructed bio-infiltration swales and modular infiltration trenches to address the Chollas Creek Diazinon TMDL and the Dissolved Metals TMDL. These BMPs are monitored for effectiveness and no exceedances of the TMDL WLA thresholds occurred this season at effluent sites. Caltrans has requested release from monitoring requirements. A State Water Board decision is awaited. Caltrans plans to continue monitoring for the 2018–19 wet season.

5.2.2 Tier 1 Project

The Tier 1 Project includes monitoring several BMPs—see Table 3.03. These BMPs are monitored for effectiveness. Caltrans has requested release from monitoring requirements in several watersheds. A State Water Board decision is awaited. Caltrans plans to continue monitoring for the 2018–19 wet season.

5.2.3 District 8 Coachella Valley TMDL Monitoring Project

As noted in Section 3.1.3, Caltrans is waiting for direction from the Colorado River Basin Water Board on the next phase of the TMDL.

5.2.4 Rainbow Creek TMDL Monitoring Project

As noted in Section 3.1.3, the San Diego Basin Regional Water Board issued a letter to Caltrans reducing TMDL monitoring requirements to once every 5 years. The letter also stated that discharges from Caltrans' right-of-way are in compliance with the Rainbow Creek Total Nitrogen and Total Phosphorus TMDL. The next reporting period for Caltrans is October 1, 2020, to September 30, 2021. The letter is provided in Appendix E.

Section 6
SITES PROPOSED TO BE RELEASED FROM MONITORING

6.1 ASBS SITES

Caltrans has requested release from monitoring requirements in ASBS 24 as all six required storms have been successfully monitored.

6.2 TMDL SITES

Caltrans has started evaluating if monitoring can be discontinued at those sites where enough data has been collected. In an email dated November 30, 2017, to the State Water Board, Caltrans requested release from monitoring requirements in several watersheds. The State Water Board responded via emails dated July 20, 2018, listing watersheds where monitoring cannot be suspended or terminated. This correspondence is attached in Appendix E. In an email dated August 7, 2018, the State Water Board provided an assessment of compliance status for the 84 TMDL watersheds listed in the Caltrans NPDES Permit. Then, in emails dated August 8, 2018, the State Water Board clarified that compliance with a TMDL does not imply cessation of monitoring and their assessment is based on a final compliance deadline in year 2034. Further, the State Water Board advised Caltrans to communicate with Regional Water Boards regarding TMDL monitoring and compliance issues. On August 17, 2018, the State Water Board via email provided a list of 12 watersheds where monitoring could be terminated (see Section 3.1.3 for complete list of watersheds). There are several inconsistencies among the different communications listed here and these will need to be resolved so that resources are used most efficiently. For example, Napa River, Sonoma Creek, San Pedro, and Pacifica Beach are approved for termination of monitoring but the compliance assessment states that there is insufficient monitoring data.

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Section 7
REFERENCES

Caltrans 2016. Statewide Monitoring Program for Compliance with NPDES Permit No. 2012-0011-DWQ Areas of Special Biological Significance Quality Assurance Project Plan. Document No. CTSW-PL-16-327.03.3. August 2016.

SCCWRP 2015. Near-Coastal Water Quality at Reference Sites Following Storm Events. Technical Report 853. February 2015.

SCCWRP 2003. Final Report: Discharges into State Water Quality Protection Areas. Final Report to the State Water Resources Control Board. Contract 01-187-250. July 2003.

State Water Board 2012. Order No. 2012-0011-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit Waste Discharge Requirements (WDRs) for State of California, Department of Transportation. September 19, 2012.

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APPENDIX A

Water Quality Data
for the 2017–18 Wet Season
(Electronic Only)

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APPENDIX B

Monitoring Reports from Cooperative Agreements

(Electronic Only)

Cooperative Monitoring Agreement Report Titles and Status

Agreement Title	Report Title/Description	Report Status
Aquatic Science Center	2017 RMP Field Sampling Report THE PULSE of the BAY	Attached reports
Ventura River Estuary Trash TMDL	Ventura River Estuary Trash TMDL	In progress
Santa Monica Bay Dry and Wet Weather Bacteria TMDL Coordinated Shoreline Water Quality Monitoring Program	Santa Monica Bay Dry and Wet Weather Bacteria TMDL Coordinated Shoreline Water Quality Monitoring Program	Attached monthly reports
MOA for Contaminated Sediment Management Plan for the Dominguez Channel	Dominguez Channel Estuary Bathymetry and Sediment Transport Study Sediment Accumulation Model – 80% Deliverable DOMINGUEZ CHANNEL BATHYMETRIC SURVEY AND SITE INVESTIGATION	Attached draft reports
MOA for Receiving Water Monitoring for Ventura River Algae TMDL	2016-2017 Annual Monitoring Report	Attached report
Lake Elsinor & San Jacinto Watersheds Authority (LESJWA)	Lake Elsinore and Canyon Lake Watersheds Nutrient TMDL Monitoring 2016-2017 Annual Report Lake Elsinore and Canyon Lake Nutrient TMDL Monitoring2017-2018 Quarter 1 Report	Attached reports

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APPENDIX C

ASBS
Additional Information

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Appendix C
ASBS Additional Information

C.1 REGIONAL MONITORING GROUPS

On February 12, 2012, the State Water Board finalized the Program Final Environmental Impact Report Exception to the California Ocean Plan Areas of Special Biological Significance Waste Discharge Prohibition for Storm Water and Nonpoint Source Discharges, with Special Protections (PFEIR) (State Water Board 2012). In Chapter 7 of the PFEIR, the state is divided into three monitoring groups for regional monitoring: (1) No. CA RMG, (2) Ce. Coast RMG, and (3) So. CA RMG. The ASBS with Caltrans discharges categorized by RMGs are listed in Table C.1.

Table C.1. Regional Monitoring Groups with Associated ASBS

Northern California Regional Monitoring Group	Central Coast Regional Monitoring Group	Southern California Regional Monitoring Group
ASBS 05 (Saunders)	ASBS 09 (Fitzgerald)	ASBS 24 (Laguno to Latigo)
ASBS 08 (Redwoods)	ASBS 15 (Ano Nuevo)	ASBS 33 (Irvine Coast)
	ASBS 34 (Carmel Bay)	

C.2 HISTORICAL MONITORING AND REPORTING RESPONSIBILITES

Tables C.2, C.4, C.6, and C.8 summarize the monitoring responsibilities by organization with respect to outfall monitoring, ORW monitoring, and ORA monitoring. Tables C.3, C.5, C.7, and C-9 summarize which organizations prepared the reports for outfall monitoring, ORW monitoring, and ORA monitoring results. Caltrans has entered into data sharing agreements with each of the RMGs. Under these agreements, Caltrans provides the results of its ORW monitoring. Caltrans does not receive ORW data from the other dischargers or the ORA data collected by others. Caltrans receives the natural water quality values that are based on an analysis of the ORA data.

C.2.1 2012–13 Wet Season

For the 2012–13 wet season, Caltrans did not conduct monitoring at its outfall or ORW sites within the Northern California and Central Coast RMG areas. Caltrans conducted outfall monitoring and ORW monitoring at its sites within the Southern California RMG area. The Southern California RMG monitoring consultant, the Southern California Coastal Water Research Project (SCCWRP), conducted ORA monitoring within its area. Caltrans outfall monitoring and ORW monitoring data were reported in its annual MRR. The ORA data were reported by the monitoring consultant for the Southern California RMG in a separate document.

Table C.2. 2012–13 Monitoring Responsibilities by Organization

Monitoring	No. CA RMG	Ce. Coast RMG	So. CA RMG
Outfalls[1]	No monitoring	No monitoring	CT
Ocean Receiving Water	No monitoring	No monitoring	CT
Ocean Reference Area	No monitoring	No monitoring	RMG

Notes:

1. Coupled and non-coupled outfalls.

Table C.3. 2012–13 Reporting of Monitoring Results by Organization

Monitoring	No. CA RMG	Ce. Coast RMG	So. CA RMG
Outfalls	No report[1]	No report[1]	MRR[2]
Ocean Receiving Water	No report[1]	No report[1]	MRR[2]
Ocean Reference Area	No report[1]	No report[1]	TR 853[3]

Notes:

1. No monitoring conducted.
2. Caltrans 2013. Monitoring Results Report: Fiscal Year 2012/13. Document No. CTSW-RT-13-312.01.01. Caltrans. September 2013.
3. SCCWRP 2015. Near Coastal Water Quality at Reference Sites Following Storm Events. Technical Report 853. SCCWRP. February 2015.

C.2.2 2013–14 Wet Season

For the 2013–14 wet season, Caltrans conducted outfall monitoring and ORW monitoring at its sites within all three RMG areas. SCCWRP was under contract with the State Water Board to conduct ORA monitoring at sites within the Northern and Southern California RMG areas. The Central Coast RMG monitoring consultant, Applied Marine Sciences (AMS), conducted ocean reference area monitoring within its area.

Caltrans outfall monitoring and ORW monitoring data were reported in its annual MRR. The ORA data for all three RMG areas were reported by SCCWRP in a separate document. In addition to the separate document by SCCWRP, AMS prepared an interim report for all dischargers that are a part of the Central California RMG. This report covers outfall monitoring, ORW monitoring, and ORA monitoring results for all dischargers except Caltrans.

Table C.4. 2013–14 Monitoring Responsibilities by Organization

Monitoring	No. CA RMG	Ce. Coast RMG	So. CA RMG
Outfalls[1]	CT	CT	CT
Ocean Receiving Water	CT	CT	CT
Ocean Reference Area	SCCWRP[2]	RMG	RMG

Notes:

1. Coupled and non-coupled outfalls.
2. SCCWRP was under contract by the State Water Board to collect samples at the ocean reference area sites within the Northern California RMG area.

Table C.5. 2013–14 Reporting of Monitoring Results by Organization

Monitoring	No. CA RMG	Ce. Coast RMG	So. CA RMG
Outfalls	MRR[1]	MRR[1]	MRR[1]
Ocean Receiving Water	MRR[1]	MRR[1]	MRR[1]
Ocean Reference Area	TR853[2]	TR853[2, 3]	TR853[2]

Notes:

1. Caltrans 2014. Monitoring Results Report: Fiscal Year 2013/14. Document No. CTSW-RT-14-312.01.02. Caltrans. October.
2. SCCWRP 2015. Near Coastal Water Quality at Reference Sites Following Storm Events. Technical Report 853. SCCWRP. February.
3. Central Coast RMG 2015. Central California Regional Monitoring Program Stormwater Discharges into Areas of Special Biological Significance Interim Report 2013–14. July 15.

C.2.3 2014–15 Wet Season

For the 2014–15 wet season, Caltrans conducted outfall monitoring and ORW monitoring at its sites within all three RMG areas. Additionally, Caltrans conducted ORA monitoring at two sites in the Northern California RMG area. Other ASBS dischargers in the Northern California RMG area were required to conduct their own ORA monitoring. The Central Coast RMG monitoring consultant, AMS, conducted ocean reference area monitoring within its area. No monitoring was conducted in the Southern California RMG area since ORA monitoring has been completed.

Caltrans outfall monitoring, ORW monitoring data, and ORA monitoring data were reported in its annual MRR. The Central Coast RMG monitoring consultant, AMS, did not prepare an interim report for the 2014–15 wet season. The data from the 2014–15 wet season is presented in a final report following the 2015–16 wet season.

Table C.6. 2014–15 Monitoring Responsibilities by Organization

Monitoring	No. CA RMG	Ce. Coast RMG	So. CA RMG
Outfalls[1]	CT	CT	CT
Ocean Receiving Water	CT	CT	CT
Ocean Reference Area	CT[2]	RMG	Monitoring Complete

Notes:

1. Coupled and non-coupled outfalls.
2. Caltrans monitored two ORA sites: one for ASBS 05 (Saunders) and one for ASBS 08 (Redwoods). The other dischargers from the No. CA RMG monitored the remaining ORA sites.

Table C.7. 2014–15 Reporting of Monitoring Results by Organization

Monitoring	No. CA RMG	Ce. Coast RMG	So. CA RMG
Outfalls	MRR[1]	MRR[1]	MRR[1]
Ocean Receiving Water	MRR[1]	MRR[1]	MRR[1]
Ocean Reference Area	MRR[1]	No Report[2]	No Report[3]

Notes:

1. Caltrans 2015. Monitoring Results Report: Fiscal Year 2014–15. Document No. CTSW-RT-15-312.01.02. Caltrans. October.
2. The Central Coast RMG did not prepare an interim report for the 2014–15 wet season. The data collected for the 2014–15 wet season will be presented in the final report, which will include all wet seasons. The final report was submitted August 2016.
3. Monitoring is complete.

C.2.4 2015–16 Wet Season

For the 2015–16 wet season, Caltrans conducted outfall monitoring and ORW monitoring at its sites within all three RMG areas. Additionally, Caltrans conducted ORA monitoring at two sites in the Northern California RMG area. Other ASBS dischargers in the Northern California RMG area were required to conduct their own ORA monitoring. The Central Coast RMG monitoring consultant, AMS, conducted ocean reference area monitoring within its area. No monitoring was conducted in the Southern California RMG area since ORA monitoring has been completed.

Caltrans outfall monitoring, ORW monitoring data, and ORA monitoring data were reported in its annual MRR. The Central Coast RMG monitoring consultant, AMS, did not prepare an interim report for the 2015–16 wet season. The data from the 2015–16 wet season is presented in a final report following the 2015–16 wet season.

Table C.8. 2015–16 Monitoring Responsibilities by Organization

Monitoring	No. CA RMG	Ce. Coast RMG	So. CA RMG
Outfalls[1]	CT	CT	CT
Ocean Receiving Water	CT	CT	CT
Ocean Reference Area	CT[2]	RMG	Monitoring Complete

Notes:

1. Coupled and non-coupled outfalls.
2. Caltrans monitored two ORA sites: one for ASBS 05 (Saunders) and one for ASBS 08 (Redwoods). The other dischargers from the No. CA RMG monitored the remaining ORA sites.

Table C.9. 2015–16 Reporting of Monitoring Results by Organization

Monitoring	No. CA RMG	Ce. Coast RMG	So. CA RMG
Outfalls	MRR[1]	MRR[1]	MRR[1]
Ocean Receiving Water	MRR[1]	MRR[1]	MRR[1]
Ocean Reference Area	MRR[1]	RMG[2]	No Report[3]

Notes:

1. AMS 2016. Final Report 2013–2016 Central Coast Regional Monitoring Program Water Quality in Areas of Special Biological Significance. August 29, 2016.
2. Caltrans 2016. Monitoring Results Report: Fiscal Year 2015–16. Document No. CTSW-RT-16-312.01.02. Caltrans. October.
3. Monitoring is complete.

C.2.5 2016–17 Wet Season

For the 2016–17 wet season, Caltrans conducted outfall monitoring and ORW monitoring at its sites within all three RMG areas. No monitoring was conducted in any of RMG areas because all ORA monitoring has been completed. Caltrans outfall monitoring and ORW monitoring data were reported in its annual MRR

C.3 ANNUAL RUNOFF VOLUME ESTIMATE

The annual runoff volumes presented in the data tables for Section 2 are estimated for each ASBS outfall as follows:

$$V_{runoff} = R_V * V_{rainfall} = R_V * A * D_{rainfall}$$

Where:

R_V = dimensionless volumetric runoff coefficient, calculated as follows (Reese 2006):

$$R_V = 0.0091 * I - 0.0204$$

Where:

I = percent imperviousness (%)

A = catchment area (ft^2)

$D_{rainfall}$ = seasonal precipitation (ft)

The catchment area and the percent imperviousness are estimated from as-builts and, where possible, verified in the field during storm events. The seasonal precipitation data comes from nearby rain gauges. These rain gauges are composed of:

No. CA RMG Rain Gauges:

- Mesowest Rain Gauge Station ORIC1
- Mesowest Rain Gauge Station TERC1

Ce. Coast Rain Gauges:

- Caltrans rain gauge installed near monitoring site
- Weather Underground Rain Gauge Station KCACARME19
- Weather Underground Rain Gauge Station KCAMOSSB3

So. CA Rain Gauges:

- Big Rock Mesa Precipitation Station
- Electric Avenue Pumping Plant Station
- Lechuza Patrol Station #72
- Leo Carrillo Beach RAWS Station LCBC1
- Monte Nido FS Station #67
- Santa Monica Mountains Deals Flat Station
- Corona Del Mar Station E3141
- Laguna Beach Station LAGC1
- Newport Beach Station 3L3

APPENDIX D

Water Quality Reference Values for TMDL Sites

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Appendix D
Water Quality Reference Values for TMDL Sites

D.1 WATER QUALITY REFERENCE VALUES

Tables D.01 through D.15 contain the reference values used in the TMDL data tables in Section 3.

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Table D.01. Reference Values for Tier 1 Project Site 1-341

Constituent	Units	California Toxics Rule[1] Freshwater Acute	California Toxics Rule[1] Freshwater Chronic	Region 1 Basin Plan[1] Freshwater Acute	Region 1 Basin Plan[1] Freshwater Chronic
Conventionals					
pH	pH units			6.5 - 8.5	
Temperature	Degrees F			≤ 5°F increase	
TDS (90% Upper Limit)[b]	mg/L				275[b]
TDS (50% Upper Limit)[a]	mg/L				140[a]
Nutrients					
Nitrate (as N)	mg/L			10	
Metals (Totals Only)					
Aluminum	µg/L			1000	
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]		
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	50	
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]		

Constituent Notes

a. 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

b. 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER of 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a)

guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 1 Basin Plan

1. The Basin Plan incorporates by reference the primary drinking water MCLs specified in Title 22 of the California Code of Regulations. Surface waters designated for use as domestic or MUN shall not contain concentrations of constituents in excess of the MCLs in Table 64431-A (Inorganic Chemicals), Table 64433.2-A (Fluoride), Table 64444-A (Organic Chemicals), and Table 64449-A (Consumer Acceptance Limits) and 64449-B (Ranges) of Title 22. Values displayed above in the table are primary MCLs unless specified.

a. 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

b. 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.

Table D.02. Reference Values for Tier 1 Project Site 1-342

Constituent	Units	California Toxics Rule[1] Freshwater		Region 1 Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
pH	pH units			6.5 - 8.5	
Temperature	Degrees F			≤ 5°F increase	
TDS (90% Upper Limit)[b]	mg/L				200[b]
TDS (50% Upper Limit)[a]	mg/L				120[a]
Nutrients					
Nitrate (as N)	mg/L			10	
Metals (Totals Only)					
Aluminum	µg/L			1000	
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]		
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	50	
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]		

Constituent Notes

a. 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

b. 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER of 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a)

guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 1 Basin Plan

1. The Basin Plan incorporates by reference the primary drinking water MCLs specified in Title 22 of the California Code of Regulations. Surface waters designated for use as domestic or MUN shall not contain concentrations of constituents in excess of the MCLs in Table 64431-A (Inorganic Chemicals), Table 64433.2-A (Fluoride), Table 64444-A (Organic Chemicals), and Table 64449-A (Consumer Acceptance Limits) and 64449-B (Ranges) of Title 22. Values displayed above in the table are primary MCLs unless specified.

a. 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

b. 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.

Table D.03. Reference Values for Tier 1 Project Sites 2-303 and 2-304

Constituent	Units	California Toxics Rule[1] Freshwater		Region 1 Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
Hardness as $CaCO_3$	mg/L				220
pH	pH units			7.0 to 8.5	
Temperature	Degrees F			≤ 5°F increase	
Nutrients					
Nitrate as N	mg/L			10	
Nitrite as N	mg/L			1.0	
Metals (Totals Only)					
Aluminum	µg/L			1000	
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]		50
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	50	22
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]		51

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 1 Basin Plan

1. The Basin Plan incorporates by reference the primary drinking water MCLs specified in Title 22 of the California Code of Regulations. Surface waters designated for use as domestic or MUN shall not contain concentrations of constituents in excess of the MCLs in Table 64431-A (Inorganic Chemicals), Table 64433.2-A

(Fluoride), Table 64444-A (Organic Chemicals), and Table 64449-A (Consumer Acceptance Limits) and 64449-B (Ranges) of Title 22. Values displayed above in the table are primary MCLs unless specified.

Table D.04. Reference Values for Tier 1 Project Site 2-305

Constituent	Units	California Toxics Rule[1] Freshwater		Region 1 Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
Hardness as $CaCO_3$	mg/L				400
pH	pH units			7.0 to 9.0	
Temperature	Degrees F			≤ 5°F increase	
Nutrients					
Nitrate as N	mg/L			10	
Metals (Totals Only)					
Aluminum	µg/L			1000	
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]		
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	50	
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]		

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 1 Basin Plan

1. The Basin Plan incorporates by reference the primary drinking water MCLs specified in Title 22 of the California Code of Regulations. Surface waters designated for use as domestic or MUN shall not contain concentrations of constituents in excess of the MCLs in Table 64431-A (Inorganic Chemicals), Table 64433.2-A (Fluoride), Table 64444-A (Organic Chemicals), and Table 64449-A (Consumer Acceptance Limits) and 64449-B (Ranges) of Title 22. Values displayed above in the table are primary MCLs unless specified.

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Table D.05. Reference Values for Tier 1 Project Site 2-306

Constituent	Units	California Toxics Rule[1] Freshwater		Region 1 Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
TDS (90% Upper Limit)[b]	mg/L				160[b]
TDS (50% Upper Limit)[a]	mg/L				90[a]
pH	pH units			6.5 to 8.5	
Temperature	Degrees C			≤ 5°F increase	
Nutrients					
Nitrate as N	mg/L			10	
Metals (Totals Only)					
Aluminum	µg/L			1000	
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]		
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	50	
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]		

Constituent Notes

a. 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

b. 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a)

guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 1 Basin Plan

1. The Basin Plan incorporates by reference the primary drinking water MCLs specified in Title 22 of the California Code of Regulations. Surface waters designated for use as domestic or MUN shall not contain concentrations of constituents in excess of the MCLs in Table 64431-A (Inorganic Chemicals), Table 64433.2-A (Fluoride), Table 64444-A (Organic Chemicals), and Table 64449-A (Consumer Acceptance Limits) and 64449-B (Ranges) of Title 22. Values displayed above in the table are primary MCLs unless specified.

a. 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.

b. 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.

Table D.06. Reference Values for Tier 1 Project Site 3-397 and 3-406

Constituent	Units	California Toxics Rule[1] Freshwater		Region 5S Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
Total Dissolved Solids	mg/L				125
Turbidity	NTU			See Below[c]	50
pH	pH units			6.5 to 8.5	
Temperature	Degrees F			≤ 5°F increase	
Nutrients					
Nitrate as N	mg/L				10
Metals (Totals Only)					
Aluminum	µg/L				1000
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]		5.6[b]
Iron	µg/L				300
Lead	µg/L	65[a,c,d]	2.5[a,c,d]		
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]		16[b]
Microbiological					
Fecal Coliform	MPN/100 mL				200/400[b]
Other					
Methylmercury	ng/L				0.08/0.24[a]

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a)

guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 5 Basin Plan

1. The Basin Plan incorporates by reference the primary drinking water MCLs specified in Title 22 of the California Code of Regulations. Surface waters designated for use as domestic or MUN shall not contain concentrations of constituents in excess of the MCLs in Table 64431-A (Inorganic Chemicals), Table 64433.2-A (Fluoride), Table 64444-A (Organic Chemicals), and Table 64449-A (Consumer Acceptance Limits) and 64449-B (Ranges) of Title 22. Values displayed above in the table are primary MCLs unless specified.

a. The average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/kg, wet weight, in muscle tissue of trophic level 3 and 4 fish, respectively (150-500 mm total length). The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length.

b. In waters designated for contact recreation (REC-1) the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.

c. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: • Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream water turbidity to exceed 2 NTUs. • Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU. • Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent. • Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs. • Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent. To determine compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Table D.07. Reference Values for Tier 1 Project Sites 4-405 and 4-406

Constituent	Units	California Toxics Rule[1] Freshwater		Region 5 Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
Total Dissolved Solids	mg/L				125
Turbidity	NTU			See Below[b]	50
pH	pH units			6.5 to 8.5	
Temperature	Degrees F			≤ 5°F increase	
Nutrients					
Nitrate as N	mg/L				10
Metals (Totals Only)					
Aluminum	µg/L				1000
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]		5.6
Iron	µg/L				300
Lead	µg/L	65[a,c,d]	2.5[a,c,d]		
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]		16
Hydrocarbons					
Oil and Grease	mg/L				None allowed
Microbiological					
Fecal Coliform	MPN/100 mL				200/400[a]

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance. a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a)

guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 5 Basin Plan

1. The Basin Plan incorporates by reference the primary drinking water MCLs specified in Title 22 of the California Code of Regulations. Surface waters designated for use as domestic or MUN shall not contain concentrations of constituents in excess of the MCLs in Table 64431-A (Inorganic Chemicals), Table 64433.2-A (Fluoride), Table 64444-A (Organic Chemicals), and Table 64449-A (Consumer Acceptance Limits) and 64449-B (Ranges) of Title 22. Values displayed above in the table are primary MCLs unless specified.

a. In waters designated for contact recreation (REC-1) the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.

b. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: • Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream water turbidity to exceed 2 NTUs. • Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU. • Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent. • Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs. • Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent. To determine compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Table D.08. Reference Values for Tier 1 Project Site 4-407

Constituent	Units	California Toxics Rule[1] Freshwater		Region 2 Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
pH	pH units			No Δ > 0.5	
Temperature	Degrees F			≤ 5°F increase	
TDS	mg/L			500	
Nutrients					
Nitrate (as N)	mg/L			10	
Metals (Totals Only)					
Aluminum	µg/L			1000	
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]	13[a,b,c]	9[a,b,c]
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	65[a,b,d]	2.5[a,b,d]
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]	120[a,b,e]	120[a,b,e]
Microbiologicals					
Fecal Coliform	MPN/100 mL				151

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 2 Basin Plan

1. Numerical freshwater quality objectives contained in Table 3-4 in the Basin Plan.

a. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.

b. These objectives are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

c. The objectives for copper are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for copper is e(0.8545H-1.702). The 1-hour average for copper is e(0.9422H-1.700).

d. The objectives for lead are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is e(1.273H -4.705). The 1-hour average for lead is e(1.273H-1.460).

e. The objectives for zinc are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for zinc is e(0.8473 H+0.884). The 1-hour average for zinc is e(0.8473 H+ 0.884).

Table D.09. Reference Values for Tier 1 Project Site 4-412 and 4-413

Constituent	Units	California Toxics Rule[1] Freshwater		Region 2 Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
pH	pH units			No Δ > 0.5	
Temperature	Degrees F			≤ 5°F increase	
TDS	mg/L			500	
Nutrients					
Nitrate (as N)	mg/L			10	
Metals (Totals Only)					
Aluminum	µg/L			1000	
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]	13[a,b,c]	9[a,b,c]
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	65[a,b,d]	2.5[a,b,d]
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]	120[a,b,e]	120[a,b,e]
Microbiologicals					
Fecal Coliform	MPN/100 mL				151

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 2 Basin Plan

1. Numerical freshwater quality objectives contained in Table 3-4 in the Basin Plan.

a. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.

b. These objectives are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

c. The objectives for copper are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for copper is e(0.8545H-1.702). The 1-hour average for copper is e(0.9422H-1.700).

d. The objectives for lead are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is e(1.273H -4.705). The 1-hour average for lead is e(1.273H-1.460).

e. The objectives for zinc are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for zinc is e(0.8473 H+0.884). The 1-hour average for zinc is e(0.8473 H+ 0.884).

Table D.10. Reference Values for Tier 1 Project Sites 4-414 and 4-415

Constituent	Units	California Toxics Rule[1] Freshwater		Region 2 Basin Plan[1] Freshwater	
		Acute	Chronic	Acute	Chronic
Conventionals					
pH	pH units			No Δ > 0.5	
Temperature	Degrees F			≤ 5°F increase	
TDS	mg/L			500	
Metals (Totals Only)					
Aluminum	µg/L			1000	
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]	13[a,b,c]	9.0[a,b,c]
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	65[a,b,d]	2.5[a,b,d]
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]	120[a,b,e]	120[a,b,e]
Methyl Mercury	ng/L			0.05	0.1
Microbiologicals					
Fecal Coliform	MPN/100 mL				151

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 2 Basin Plan

1. Numerical freshwater quality objectives contained in Table 3-4 in the Basin Plan.

a. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.

b. These objectives are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

c. The objectives for copper are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for copper is e(0.8545H-1.702). The 1-hour average for copper is e(0.9422H-1.700).

d. The objectives for lead are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is e(1.273H -4.705). The 1-hour average for lead is e(1.273H-1.460).

e. The objectives for zinc are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for zinc is e(0.8473 H+0.884). The 1-hour average for zinc is e(0.8473 H+ 0.884).

Table D.11. Reference Values for Tier 1 Project Sites 4-428 and 4-429

Constituent	Units	California Toxics Rule[1]				Region 2 Basin Plan[1,2,3]			
		Freshwater		Saltwater		Freshwater		Marine Water	
		Acute	Chronic	Acute (µg/L)	Chronic (µg/L)	Acute	Chronic	Acute	Chronic
Bacteria									
Enterococcus	MPN/100 mL					151		500	
Metals (Totals Only)									
Copper	µg/L	17[a,b,c]	11[a,b,c]	15 [a,d]	9.5 [a,d]	18[a,b,c,g]	12[a,b,c,g]	5.8[a,d]	3.7[a,d]
Lead	µg/L	86[a,c]	3.3[a,c]	109 [a,b,d]	4.2 [a,b,d]	114[a,b,c,h]	4.4[a,b,c,h]	221[a,b,d]	8.5[a,b,d]
Mercury	µg/L					2.4[a,i]	0.025[a,i]	2.1[a,e]	0.025[a,e]
Zinc	µg/L	146[a,b,c]	148[a,b,c]	141 [a,d]	142 [a,d]	150[a]	150[a]	95[a,b,d]	86[a,b,d]
Polychlorinated Biphenyls									
Total PCBs	µg/L		0.014[e]		0.03 [f]				

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on NPDES No. CA0005240 hardness value of 130 mg/l as calcium carbonate (CaCO3) for Carquinez Strait.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

e. PCBs are a class of chemical that include aroclors 1242, 1254, 1221, 1232, 1248, 1260. The aquatic life criteria apply to the sum of this set of seven aroclors.

Region 2 Basin Plan

1. Numerical freshwater quality objectives contained in Table 3-4 in the Basin Plan.
2. Numerical Marine Water quality objectives contained in Table 3-3 in the Basin Plan.
3. Carquinez Strait is classified as Estuarine, therefore both freshwater and marine water basin plan and CTR objectives may apply.

Freshwater Notes

a. Freshwaters are those in which the salinity is equal to or less than 1 part per thousand 95% of the time, as set forth in Chapter 4 of the Basin Plan. Unless a site-specific objective has been adopted, these objectives shall

apply to all freshwaters except for the South Bay south of Dumbart on Bridge, where the California Toxics Rule (CTR) applies. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable objectives are the more stringent of the marine (Table 3-3) and freshwater objectives.

b. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.

c. These objectives are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These objectives for metals are expressed in terms of the dissolved fraction of the metal in the water column.

e. The objectives for copper are based on hardness. The hardness based objectives are calculated using the following formulas where H = ln (hardness): The 4-day average objective for copper is e(0.8545H-1.702). The 1-hour average for copper is e(0.9422H-1.700).

f. The objectives for lead are based on hardness. The hardness based objectives are calculated using the following formulas where H = ln (hardness): The 4-day average objective is e(1.273H -4.705). The 1-hour average for lead is e(1.273H-1.460).

g. Source: U.S. EPA Quality Criteria for Water 1986 (EPA 440/5-86-001), which established a mercury criterion of 0.012 ug/l. The Basin Plan set the objective at 0.025 based on considerations of the level of detection attainable at that time.

h. The objectives for zinc are based on hardness. The hardness based objectives are calculated using the following formulas where H = ln (hardness): The 4-day average objective for zinc is e(0.8473 H+0.884). The 1-hour average for zinc is e(0.8473 H+ 0.884).

Marine Water Notes

a. Marine waters are those in which the salinity is equal to or greater than 10 parts per thousand 95% of the time, as set forth in Chapter 4 of the Basin Plan. Unless a site-specific objective has been adopted, these objectives shall apply to all marine waters except for the South Bay south of Dumbarton Bridge (where the California Toxics Rule (CTR) applies) or as specified in note g (below). For waters in which the salinity is between 1 and 10 parts per thousand, the applicable objectives are the more stringent of the freshwater (Table 3-4) or marine objectives.

b. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.

c. These objectives for metals are expressed in terms of the dissolved fraction of the metal in the water column.

d. According to the CTR, these objectives are expressed as a function of the water-effect ratio (WER). A WER of 1.0 is assumed because no site specific data are available.

e. Source: U.S. EPA Ambient Water Quality Criteria for Mercury (1984).

Table D.12. Reference Values for Tier 1 Project Sites 5-306, 5-307, and 5-308

Constituent	Units	California Toxics Rule[1] Freshwater		Region 3 Basin Plan[1] Freshwater		
		Acute	Chronic	Hard	Soft	Acute
Conventionals						
Hardness	mg/L			>100	<100	
Metals (Totals Only)						
Aluminum	µg/L					1000
Copper	µg/L	13[a,b,c,d]	9.0[a,b,c,d]	30[a]	10[a]	
Lead	µg/L	65[a,c,d]	2.5[a,c,d]	30[a]	30[a]	
Zinc	µg/L	120[a,b,c,d]	120[a,b,c,d]	200[a]	4.0[a]	
Microbiologicals						
Fecal Coliform	MPN/100 mL			400	200	

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the default CTR hardness value of 100 mg/l as calcium carbonate (CaCO3). No site specific hardness data available.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 3 Basin Plan

1. Numerical freshwater quality objectives contained in Table 3-5 in the Region 3 Basin Plan.

a. Based on limiting values recommended in the National Academy of Sciences-National Academy of Engineers "Water Quality Criteria 1973." Values are 90 percentile values except as noted in qualifying note "c" in Basin Plan.

Table D.13. Reference Values for Tier 1 Project Sites 7-08 and 7-09

Constituent	Units	California Toxics Rule[1] Freshwater Acute	California Toxics Rule[1] Freshwater Chronic	Region 4 Basin Plan
TMDL Specific Constituents				
Cadmium (Total)	µg/L	10.4[a,b,c]	4.4[a,b,c]	
Copper (Total)	µg/L	28.04[b,c]	17.5[b,c]	
Lead (Total)	µg/L	209[a,c]	8.1[a,c]	
Zinc (Total)	µg/L	224[b,c]	224[b,c]	
Field Measurements				
pH	pH			6.5 to 8.5
Conventionals				
Total Dissolved Solids	mg/L			950

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on the CTR default hardness value of 209 mg/l as calcium carbonate (CaCO3) given for Reach 4 in Appendix A Los Angeles River Metals TMDL Basin Plan Amendment Approved by Los Angeles Regional Water Quality Control Board, September 6, 2006.

b. This criterion has been recalculated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER of 1.0 is assumed because no site specific data are available.

Table D.14. Reference Values for Tier 1 Project Sites 11-350, 11-351, 11-352, 11-353, 11-355, 11-356, 11-357, 11-358, 11-359, and 11-360

Constituent	Units	California Toxics Rule[1] Freshwater Acute	California Toxics Rule[1] Freshwater Chronic	Region 9 Basin Plan General Objectives	Region 9 Basin Plan Acute
TMDL Specific Constituents					
Copper	µg/L	12[b,c,d]	8.2[b,c,d]		12[a]
Diazinon	µg/L				0.072
Lead	µg/L	58[a,c,d]	2.3[a,c,d]		58[a]
Zinc	µg/L	108[b,c,d]	109[b,c,d]		108[a]
Field Measurements					
pH	pH			6.5 to 8.5	
Bacteria					
Fecal Coliform	µg/L			4000[b]	
Conventionals					
Phosphorus (Total)	mg/L			0.1[c]	
Elements					
Chromium (Total)	µg/L	1605[c]	191[c]		
Copper (Total)	µg/L	13[b,c]	8.6[b,c]		13[a]
Lead (Total)	µg/L	72[a,c]	2.8[a,c]		72[a]
Zinc (Total)	µg/L	110[b,c]	110[b,c]		110[a]

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on hardness value of 90.8 mg/l as calcium carbonate (CaCO3) in Appendix G, Metals Concentration Reduction Percentages Required to Meet the Chollas Creek Metals Total Maximum Daily Loads. California Regional Water Quality Control Board, San Diego Region.

b. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

c. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER of 1.0 is assumed because no site specific data are available.

d. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 9 Basin Plan

a. The TMDL numeric targets for copper, lead, and zinc are set equal to the numeric water quality criteria as defined in the California Toxics Rule (CTR) and shown below. Because the concentration of a dissolved metal causing a toxic effect varies significantly with hardness, the water quality criteria are expressed in the CTR as hardness based equations. The numeric targets are equal to the loading capacity of these metals in Chollas Creek.
b. In waters designated for non-contact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentrations for any 30-day period, shall not exceed 2,000 organisms per 100 ml nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000 organisms per 100 ml. Not a single sample reference value.
c. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Not a single sample reference.

Table D.15. Reference Values for Tier 1 Project Sites 12-254, 12-255, 12-257, 12-258, 12-329, and 12-330

Constituent	Units	California Toxics Rule[1] Freshwater Acute	California Toxics Rule[1] Freshwater Chronic	Region 8 Basin Plan
TMDL Specific Constituents				
Cadmium (Dissolved)	µg/L	10.8[b,c,d,e]	4.2[b,c,d,e]	
Copper (Dissolved)	µg/L	30.2[c,d,e]	19[c,d,e]	
Lead (Dissolved)	µg/L	162[b,d,e]	6.3[b,d,e]	
Zinc (Dissolved)	µg/L	243[c,d,e]	245[c,d,e]	
Toxaphene	µg/L	0.73	0.0002	
4,4'-DDT	µg/L	1.1[a]	0.001[a]	
Field Measurements				
pH	pH			6.5 to 8.5
Conventionals				
Total Dissolved Solids	mg/L			1500
Bacteria				
Fecal Coliform	per 100 mL			400[a]
Metals (Totals Only)				
Copper	µg/L	31.4[c,d]	19[c,d]	
Lead	µg/L	244[b,d]	9.5[b,d]	
Zinc	µg/L	248[c,d]	248[c,d]	

California Toxics Rule

1. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 2000. Blank spaces indicate the absence of national section 304(a) criteria guidance.

a. This criterion is based on 304(a) aquatic life criterion issued in 1980.

b. Conversion Factors for these pollutants in freshwater are hardness dependent. CFs are based on hardness value of 236 mg/l as calcium carbonate (CaCO3) in Table 5-2 of Total Maximum Daily Loads For Toxic Pollutants San Diego Creek and Newport Bay, California (US EPA Region 9).

c. This criterion has been updated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA-820-B-96-001, September 1996.

d. Criteria for these metals are expressed as a function of the water-effect ratio (WER). A WER 0f 1.0 is assumed because no site specific data are available.

e. These freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column. Criterion values were calculated by using USEPA's Clean Water Act 304(a) guidance values (described in the total recoverable fraction) and then applying the conversion factors in #131.36(b)(1) and (2).

Region 8 Basin Plan

a. REC-1 standard: Not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period.

APPENDIX E

State Water Board and Regional Water Board Communications

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to facilitate double-sided printing.

Shinneman, Joel Tyson

From: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>
Sent: Thursday, May 31, 2018 11:21 AM
To: Shinneman, Joel Tyson
Cc: Alderete, David Joseph; Murphy, Kevin
Subject: FW: Coachella Valley TMDL

From: Dunn, Kai@Waterboards [mailto:Kai.Dunn@waterboards.ca.gov]
Sent: Thursday, May 31, 2018 10:05 AM
To: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>
Cc: Shukry-Zeywar, Nadim@Waterboards <Nadim.Shukry-Zeywar@waterboards.ca.gov>; Chakraborty, Suhas@Waterboards <Suhas.Chakraborty@waterboards.ca.gov>; Dunn, Kai@Waterboards <Kai.Dunn@waterboards.ca.gov>; Chen, Jenny@Waterboards <Jenny.Chen@waterboards.ca.gov>; Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>
Subject: RE: Coachella Valley TMDL

Hi Bhaskar,

After consulting with our TMDL unit, the response from TMDL is " *The TMDL Program hasn't made any decision on phase 2 implementation of this TMDL because we are still analyzing the data and information from phase 1 implementation to find the sources of impairments*." Thanks.

Kai Dunn, Ph.D., P.E.
Senior Water Resources Control Engineer – NPDES/Stormwater/401 WQC Unit Chief
California Regional Water Quality Control Board – Colorado River Basin Region (R7)
73-720 Fred Waring Dr. Ste 100
Palm Desert, CA 92260
TEL: 760-7768986, FAX 760-3416820, Front Desk: 760-3467491
Kai.dunn@waterboards.ca.gov

From: Joshi, Bhaskar@DOT [mailto:bhaskar.joshi@dot.ca.gov]
Sent: Friday, May 25, 2018 10:04 AM
To: Dunn, Kai@Waterboards <Kai.Dunn@waterboards.ca.gov>
Subject: Coachella Valley TMDL

Hello , Good day!

We have been involved with the Coachella valley TMDL monitoring Phase I along with other stakeholders in the Desert Task Force
We had submitted a Phase I monitoring report which showed no impacts from Caltrans after 2 seasons of monitoring.
we had requested that Caltrans be delisted from this TMDL.
At that time the RWQCB asked us to wait for a decision
Is there any updates about the TMDL monitoring or implementation going forward?
I would be grateful if you could share any information.

Regards

Bhaskar Joshi, Ph.D, P.E., PMP
Office Chief-Storm Water Program Development
Division of Environmental Analysis
California Department of Transportation
Desk: 916-653-5240
Cell:
Fax: 916-653-6366

How did we do? Help us serve you better! Caltrans Environmental Analysis Customer Service Survey Link:
https://www.surveymonkey.com/r/CTEnvironmentalAnalysisSurvey

From:	Joshi, Bhaskar@DOT
To:	"Chen, Jenny@Waterboards"
Cc:	Perreira, Gayleen@Waterboards; Kontaxis, Constantine@DOT
Subject:	RE: Action Items from Oct. 24 Meeting
Date:	Thursday, November 30, 2017 1:42:00 PM
Attachments:	MONITORING RECOMMENDATIONS FOR TMDL WATERSHEDS NOV 2017.pdf

Hello Jenny , Good day!
Atttached are our recommendations for watersheds where monitoring is no longer needed.

Yellow highlighted watersheds indicate locations where monitoring is not needed.

More detailed information will be forthcoming in the TMDL Progress report which due at the end of this year and we are currently working on for the January 1, 2018 submittal date.
Please let me know if you have any questions

Regards

Bhaskar Joshi, Ph.D, P.E., PMP
Office Chief-Storm Water Program Development
Division of Environmental Analysis
California Department of Transportation
Desk: 916-653-5240
Cell:
Fax: 916-653-6366

How did we do? Help us serve you better! Caltrans Environmental Analysis Customer Service Survey Link:
https://www.surveymonkey.com/r/CTEnvironmentalAnalysisSurvey

From: Chen, Jenny@Waterboards [mailto:Jenny.Chen@waterboards.ca.gov]
Sent: Wednesday, November 29, 2017 9:59 AM
To: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>
Cc: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>
Subject: RE: Action Items from Oct. 24 Meeting

Hi Bhaskar,

Have you compiled the information on watersheds in which Caltrans believes that further monitoring is no longer needed?

One of things that Galyleen asks me to do for November is to review your information and determine if we could recommend stop the monitoring.

Jenny Chen
Phone: (916) 341-5570
Water Resources Control Engineer
Municipal Storm Water Unit
Division of Water Quality

From: Joshi, Bhaskar@DOT [mailto:bhaskar.joshi@dot.ca.gov]
Sent: Thursday, October 26, 2017 11:43 AM
To: Chen, Jenny@Waterboards <Jenny.Chen@waterboards.ca.gov>
Subject: Automatic reply: Action Items from Oct. 24 Meeting

I will be on vacation. I will respond to you upon my return. If you need immediate assistance please contact Cornelis Hakim at 916-653-0647 (cornelis.hakim@dot.ca.gov). You may also contact my supervisor Shaila Chwodhury at 916-653-4446 for urgent issues (Shaila.Chowdhury@dot.ca.gov)

From:	Perreira, Gayleen@Waterboards
To:	Joshi, Bhaskar@DOT
Cc:	Messina, Diana@Waterboards; Chowdhury, Shaila K@DOT; Dhillon, Sheena@Waterboards; Smythe, Mark@Waterboards; Beckwith, Michelle@Waterboards
Subject:	Denial of Suspending Monitoring at Requested TMDL sites with the Santa Ana Regional Water Quality Control Board
Date:	Friday, July 20, 2018 3:06:30 PM

Bhaskar,

Thank you for your email on November 30, 2017 requesting suspension of monitoring within 68 TMDL watersheds. California State Department of Transportation (Caltrans) will receive a letter from the State Water Resources Control Board Executive Director approving suspending monitoring of some TMDL sites, as approved by the Regional Water Quality Control Boards (Regional Water Board) Executive Officers. However, the Santa Ana Regional Water Board Executive Officer did not approve Caltrans' request to suspend monitoring at the TMDL sites identified in the table below; State Water Resources Control Board agrees.

Should you disagree with the State and Regional Water Boards determinations, please contact Ms. Hope Smythe, Executive Officer, for approval to modify the TMDL monitoring program for the following TMDL sites:

TMDL	Determination
Rhine Channel Area of Lower Newport Bay Chromium and Mercury TMDL	Monitoring requirement contained within TMDL and Basin Plan
San Diego Creek and Newport Bay including Rhine Channel Metals TMDL	Monitoring requirement contained within TMDL and Basin Plan
San Diego Creek and Upper Newport Bay Cadmium TMDL	Monitoring requirement contained within TMDL and Basin Plan
Big Bear Lake TMDL	Continued monitoring required for TMDL reassessment

Respectfully, Gayleen

Gayleen Perreira
Statewide Municipal Storm Water Program Manager
Chief, Municipal Storm Water Unit
State Water Resources Control Board
Division of Water Quality
Direct Phone Number: (916)341-5497

From:	Perreira, Gayleen@Waterboards
To:	Joshi, Bhaskar@DOT
Cc:	Messina, Diana@Waterboards; Chowdhury, Shaila K@DOT; Dhillon, Sheena@Waterboards; Roques, Dominic@Waterboards
Subject:	Denial of Suspending Monitoring at Requested TMDL sites with Central Coast Regional Water Quality Control Board
Date:	Friday, July 20, 2018 2:39:35 PM

Bhaskar,

Thank you for your email on November 30, 2017 requesting suspension of monitoring within 68 TMDL watersheds. California State Department of Transportation (Caltrans) will receive a letter from the State Water Resources Control Board Executive Director approving suspending monitoring of some TMDL sites, as approved by the Regional Water Quality Control Board (Regional Water Board) Executive Officers. However, the Central Coast Regional Water Board Executive Officer did not approve Caltrans' request to suspend monitoring at the TMDL sites identified in the table below; the State Water Resources Control Board agrees.

Should you disagree with the State and Regional Water Boards determinations, please contact Mr. John M. Robertson, Executive Officer, for approval to modify the TMDL monitoring program for the following TMDL sites:

TMDL	Determination
San Lorenzo River Sediment TMDL	Additional monitoring required
Morro Bay Sediment TMDL	Additional monitoring required

Respectfully, Gayleen

Gayleen Perreira
Statewide Municipal Storm Water Program Manager
Chief, Municipal Storm Water Unit
State Water Resources Control Board
Division of Water Quality
Direct Phone Number: (916)341-5497

From:	Perreira, Gayleen@Waterboards
To:	Joshi, Bhaskar@DOT
Cc:	Messina, Diana@Waterboards; Chowdhury, Shaila K@DOT; Dhillon, Sheena@Waterboards; Newman, Jenny@Waterboards; Ridgeway, Ivar@Waterboards
Subject:	Denial of Suspending Monitoring at Requested TMDL sites with the Los Angeles Regional Water Quality Control Board
Date:	Friday, July 20, 2018 2:39:17 PM

Bhaskar,

Thank you for your email on November 30, 2017 requesting suspension of monitoring within 68 TMDL watersheds. California State Department of Transportation (Caltrans) will receive a letter from the State Water Resources Control Board Executive Director approving suspending monitoring of some TMDL sites, as approved by the Regional Water Quality Control Boards (Regional Water Board) Executive Officers. However, the Los Angeles Regional Water Board Executive Officer did not approve Caltrans' request to suspend monitoring at the TMDL sites identified in the table below; State Water Resources Control Board agrees.

Should you disagree with the State and Regional Water Boards determinations, please contact Ms. Deborah Smith, Executive Officer, for approval to modify the TMDL monitoring program for the following TMDL sites:

TMDL	Determination
Santa Monica Bay DDTs and PCBs TMDL	Additional monitoring required
Santa Monica Bay Nearshore & Offshore Debris TMDL	Additional monitoring required
Marina del Rey Harbor TMDL Toxic Pollutants TMDL	Discharge exceeds WLA, continued monitoring required
Los Angeles River Metals and Bacteria TMDLs	Discharge exceeds WLA, continued monitoring required
Malibu Creek Sedimentation and Nutrient; and Bacteria TMDLs	Discharge exceeds WLA, continued monitoring required
Machado Lake Eutrophic Algae, Ammonia, and Odors; and Pesticides and PCBs TMDLs	Discharge has a WLA, monitoring required
Colorado Lagoon Organochlorine Pesticides, PCBs, Sediment, Toxicity, PAHs, and Metals TMDL	Discharge has a WLA, monitoring required
Dominquez Channel & Greater Los Angeles & Long Beach Harbor Waters Metals TMDL	Discharge has a WLA, monitoring required
Long Beach City Beaches and Los Angeles River Estuary Indicator Bacteria TMDL	Discharge has a WLA, monitoring required
Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL	Discharge has a WLA, monitoring required
Santa Clara River Estuary and Reaches 3, 5, 6, and 7 Coliform TMDL	Discharge has a WLA, monitoring required
Los Angeles Area (Echo Park Lake; Lake Sherwood; North, Center, & Legg Lakes; Peck Road Park Lake; and Puddingstone Reservoir TMDLs)	Discharge has a WLA, monitoring required

San Gabriel River Metals and Selenium TMDL	Discharge has a WLA, monitoring required
Ballona Creek TMDLs	Monitoring required, either individual or as a party of a cooperative monitoring program
Calleguas Creek TMDLs	Monitoring required, either individual or as a party of a cooperative monitoring program
Ventura River TMDLs	Monitoring required, either individual or as a party of a cooperative monitoring program

Respectfully, Gayleen

Gayleen Perreira
Statewide Municipal Storm Water Program Manager
Chief, Municipal Storm Water Unit
State Water Resources Control Board
Division of Water Quality
Direct Phone Number: (916)341-5497

From:	Perreira, Gayleen@Waterboards
To:	Joshi, Bhaskar@DOT
Cc:	Messina, Diana@Waterboards; Chowdhury, Shaila K@DOT; Dhillon, Sheena@Waterboards; Larsen, Robert@Waterboards
Subject:	Denial of Suspending Monitoring at Requested TMDL sites with the Lahontan Regional Water Quality Control Board
Date:	Friday, July 20, 2018 2:38:00 PM

Bhaskar,

Thank you for your email on November 30, 2017 requesting suspension of monitoring within 68 TMDL watersheds. California State Department of Transportation (Caltrans) will receive a letter from the State Water Resources Control Board Executive Director approving suspending monitoring of some TMDL sites, as approved by the Regional Water Quality Control Boards (Regional Water Board) Executive Officers. However, the Lahontan Regional Water Board Executive Officer did not approve Caltrans' request to suspend monitoring at the TMDL sites identified in the table below; State Water Resources Control Board agrees.

Should you disagree with the State and Regional Water Boards determinations, please contact Patty Z Kouyoumdjian, Executive Officer, for approval to modify the TMDL monitoring program for the following TMDL sites:

TMDL	Determination
Lake Tahoe Sediment TMDL	Discharge has a WLA, monitoring required
Truckee River Sediment TMDL	Additional monitoring required

Respectfully, Gayleen

Gayleen Perreira
Statewide Municipal Storm Water Program Manager
Chief, Municipal Storm Water Unit
State Water Resources Control Board
Division of Water Quality
Direct Phone Number: (916)341-5497

From:	Perreira, Gayleen@Waterboards
To:	Joshi, Bhaskar@DOT
Cc:	Messina, Diana@Waterboards; Chowdhury, Shaila K@DOT; Dhillon, Sheena@Waterboards; Walsh, Laurie@Waterboards
Subject:	Denial of Suspending Monitoring at Requested TMDL sites with the San Diego Regional Water Quality Control Board
Date:	Friday, July 20, 2018 3:16:06 PM

Bhaskar,

Thank you for your email on November 30, 2017 requesting suspension of monitoring within 68 TMDL watersheds. California State Department of Transportation (Caltrans) will receive a letter from the State Water Resources Control Board Executive Director approving suspending monitoring of some TMDL sites, as approved by the Regional Water Quality Control Boards (Regional Water Board) Executive Officers. However, the San Diego Regional Water Board Executive Officer did not approve Caltrans' request to suspend monitoring at the TMDL sites identified in the table below; State Water Resources Control Board agrees.

Should you disagree with the State and Regional Water Boards determinations, please submit technical report supporting reduction or termination of monitoring to
Mr. David W. Gibson, Executive Officer, San Diego Regional Water Quality Control Board.

TMDL	Determination
Chollas Creek TMDLs	Discharge exceeds WLA, continued monitoring required.
Project 1-Revised Twenty Beaches and Creeks in San Diego Region TMDL	Discharge has a WLA, monitoring required

Respectfully, Gayleen

Gayleen Perreira
Statewide Municipal Storm Water Program Manager
Chief, Municipal Storm Water Unit
State Water Resources Control Board
Division of Water Quality
Direct Phone Number: (916)341-5497

From:	Perreira, Gayleen@Waterboards
To:	Joshi, Bhaskar@DOT
Cc:	Nanjundiah, Bala@DOT; Messina, Diana@Waterboards
Subject:	RE: ADM-360 Service Contract Request - Justification for the requested service not available within civil service (Title 2 Section 547.60)
Date:	Friday, July 20, 2018 11:21:46 AM

Hi Bhaskar,

Diana Messina was working on Simon's requested response. She'll be in Monday, and can let you know the status.

Gayleen

From: Joshi, Bhaskar@DOT [mailto:bhaskar.joshi@dot.ca.gov]
Sent: Friday, July 20, 2018 11:02 AM
To: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>
Cc: Nanjundiah, Bala@DOT <bala.nanjundaiah@dot.ca.gov>
Subject: RE: ADM-360 Service Contract Request - Justification for the requested service not available within civil service (Title 2 Section 547.60)

Hello Gayleen , Good day!
Please see the meail from Simon Below
He reuqested you to respond to a madated request before we can proveed with our project for evaluating soil amendments for infiltration of stormwater
It would be very helpful if you could respond to Simon for direct him appropriately
I have responded to sch request frfom SWRCB on several occassions.

Regards

Bhaskar Joshi, Ph.D, P.E.
Office Chief-Storm Water Program Development
Division of Environmental Analysis
California Department of Transportation
Desk: 916-653-5240
Cell:
Fax: 916-653-6366

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https://www.surveymonkey.com/r/CTEnvironmentalAnalysisSurvey

From: Bisrat, Simon@DOT
Sent: Friday, July 20, 2018 8:43 AM

To: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>
Cc: Nanjundiah, Bala@DOT <bala.nanjundaiah@dot.ca.gov>
Subject: FW: ADM-360 Service Contract Request - Justification for the requested service not available within civil service (Title 2 Section 547.60)

Hi Bhaskar,

We have this requirement on DPAC's ADM-360 Service Contract Request form that we need to justify why the study cannot be conducted by civil service personnel. I tracked the relevant folks at State Water Resources Control Board (SCWCB) and found the manager who can verify for us – see the email below. I spoke with her over the phone and showed interest to send out the verification but she has not responded yet. Do you know if there is any other person you may know at SWRCB who can help us on that. I am running out of time and Caltrans Legal are being adamant to process the ADM-360 without that language. I did manage to get these verifications for the other three environmental projects but not yet for your project.

Regards,

Simon Bisrat, Ph.D.
Senior Environmental Planner
Environmental Impact Mitigation Research
Caltrans – Division of Research, Innovation
& System Information
1727 30th Street, 3rd Floor
Sacramento, CA 95816
Phone: 916-227-2612

From: Bisrat, Simon@DOT
Sent: Friday, July 13, 2018 11:45 AM
To: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>
Subject: ADM-360 Service Contract Request - Justification for the requested service not available within civil service (Title 2 Section 547.60)

Dear Gayleen Perreira,

The Division of Research, Innovation, and System Information at Caltrans is setting up a study to develop the information needed for estimating stormwater runoff infiltration volumes and flow rates that would enable Caltrans practitioners to design, install, and maintain soil amendments to address permit requirements. The study is targeted to develop guidance on how to specify soil media (compost and other amendments) in order to optimize stormatwer runoff infiltration and treatment while also sustaining desirable vegetation under different conditions. The study will also evaluate biochar media for infiltration and treatment benefits in roadside applications. This note is to request if California Water Resources Control Board has the capability, capacity, and the required resources to perform this research with civil service personnel.

The research will accomplish the following specific tasks:

Phase I:

Task 1. Site Selection, Field Analyses, and Sampling

Task 2. Laboratory Testing Plan and Laboratory Testing of Native Soils and Amendments

Task 3. Laboratory Testing of Engineered Soil and Amended Soils - Native soil will be blended with the amendments in specified ratios and compaction levels

Task 4. Analyses and Reporting – Based on the information developed in Tasks 1 through 3

Task 5. Develop Interim Guidance - Based on results of the laboratory studies

Phase II:

Task 1. Field Sites Selection - Sites with different soil types will be selected

Task 2. Field Pilot Testing - Test plots will be amended with selected soil amendments and at selected compaction levels, based on Phase I laboratory test results

Task 3. Develop Final Guidance – Based on field tests and the interim guidance

Project Duration: 5 years
Available Funding: $1,097,000.00

Thank you in advance for taking the time to respond to this inquiry.

Regards,

Simon Bisrat, Ph.D.
Senior Environmental Planner
Environmental Impact Mitigation Research
Caltrans – Division of Research, Innovation
& System Information
1727 30th Street, 3rd Floor
Sacramento, CA 95816
Phone: 916-227-2612

From:	Chowdhury, Shaila K@DOT
To:	Joshi, Bhaskar@DOT; Kontaxis, Constantine@DOT
Subject:	FW: Cooperative Monitoring Fulfilling Required Monitoring Sites
Date:	Tuesday, April 10, 2018 10:25:39 AM
Attachments:	Table 4.1 CMP TMDL 2017-01-06 Bhaskar.xlsx

Perfect. Bhaskar please see the confirmation below. Please save it for our records. Also she is indicating that each cooperative monitoring effort also serve as a monitoring site towards our 100 site requirement.

T***hanks,***
Shaila Chowdhury, P.E.
Assistant Division Chief
Division of Environmental Analysis
California Department of Transportation
Phone: 916 653 4446
Cell: 916 275 2948

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https://www.surveymonkey.com/r/CTEnvironmentalAnalysisSurvey

From: Kontaxis, Constantine@DOT
Sent: Tuesday, April 10, 2018 10:15 AM
To: Chowdhury, Shaila K@DOT <shaila.chowdhury@dot.ca.gov>
Subject: FW: Cooperative Monitoring Fulfilling Required Monitoring Sites

Here is the email you were looking for.
Con

From: Messina, Diana@Waterboards [mailto:Diana.Messina@waterboards.ca.gov]
Sent: Friday, March 16, 2018 2:57 PM
To: Chowdhury, Shaila K@DOT <shaila.chowdhury@dot.ca.gov>
Cc: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>; Chen, Jenny@Waterboards <Jenny.Chen@waterboards.ca.gov>; Dhillon, Sheena@Waterboards <Sheena.Dhillon@waterboards.ca.gov>; Kontaxis, Constantine@DOT <constantine.kontaxis@dot.ca.gov>
Subject: Cooperative Monitoring Fulfilling Required Monitoring Sites

Hi Shaila,

Thank you for meeting with us and Region 5 staff today regarding Caltrans' potential participation in the Central Valley Regional Monitoring Program (RMP). You requested in writing our agreement that Caltrans' participation in this regional monitoring program would serve as one of the 100 required monitoring sites in your agency's statewide MS4 storm water permit.

Attached is the Caltrans Comprehensive Monitoring Program plan submitted to the State Water Board by your staff. If Caltrans participates in the Central Valley RMP in lieu of the current Delta monitoring, then your staff would include the RMP Cooperative Agreement in your updated Comprehensive Monitoring Plan as one of your 100 monitoring sites. (See attached spreadsheet showing other cooperative agreements that serve as a monitoring site.) We would not require Caltrans to conduct the current Delta monitoring if you participate in the RMP; it would be either one or the other.

I'm happy to answer any follow up questions you may have.

Diana

Shinneman, Joel Tyson

From: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>
Sent: Friday, August 17, 2018 1:20 PM
To: Shinneman, Joel Tyson
Subject: FW: TMDL letter

From: Dhillon, Sheena@Waterboards [mailto:Sheena.Dhillon@waterboards.ca.gov]
Sent: Friday, August 17, 2018 10:00 AM
To: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>
Cc: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>
Subject: RE: TMDL letter

Yes, that is correct.

From: Joshi, Bhaskar@DOT [mailto:bhaskar.joshi@dot.ca.gov]
Sent: Friday, August 17, 2018 9:57 AM
To: Dhillon, Sheena@Waterboards <Sheena.Dhillon@waterboards.ca.gov>
Cc: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>
Subject: RE: TMDL letter

Please confirm that you mean these locations are approved for terminating monitoring

---

From: Dhillon, Sheena@Waterboards [mailto:Sheena.Dhillon@waterboards.ca.gov]
Sent: Thursday, August 16, 2018 12:07 PM
To: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>
Cc: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>
Subject: RE: TMDL letter

Hi Bhaskar,

The list of approved TMDL watersheds is provided below.

Richardson Bay
Napa River
Sonoma Creek
San Pedro and Pacifica State Beach
San Francisco Bay (TMDL Pollutant – PCBs)
San Francisco Bay (TMDL Pollutant – Mercury)
San Francisco Bay Urban Creeks
Santa Clara River Reach
Upper Santa Clara River
Clear Lake
Cache Creek, Bear Creek, Sulphur Creek and Harley Gulch
Lake Elsinor and Canyon Lake Nutrients

Thank you,
Sheena
Sheena Dhillon
Water Resource Control Engineer
Municipal Storm Water Unit
State Water Resources Control Board
Phone: 916.322.8547
Email: Sheena.Dhillon@waterboards.ca.gov
1001 I Street, Sacramento, Ca 95814

From: Perreira, Gayleen@Waterboards
Sent: Thursday, August 16, 2018 9:44 AM
To: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>; Dhillon, Sheena@Waterboards <Sheena.Dhillon@waterboards.ca.gov>
Subject: RE: TMDL letter

Yes, we can't send the draft; but we can send an email of the list of approved sites. Sheena please send Bhaskar an email with the list of sites.

From: Joshi, Bhaskar@DOT [mailto:bhaskar.joshi@dot.ca.gov]
Sent: Thursday, August 16, 2018 9:43 AM
To: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>; Dhillon, Sheena@Waterboards <Sheena.Dhillon@waterboards.ca.gov>
Subject: RE: TMDL letter

Hi Gayleen
I did not receive the draft letter only several emails that you had sent

---

From: Perreira, Gayleen@Waterboards [mailto:Gayleen.Perreira@waterboards.ca.gov]
Sent: Thursday, August 16, 2018 9:40 AM
To: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>; Dhillon, Sheena@Waterboards <Sheena.Dhillon@waterboards.ca.gov>
Cc: Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>; Lichten, Keith@Waterboards <Keith.Lichten@waterboards.ca.gov>
Subject: RE: TMDL letter

You can plan based upon the draft letter. Tom Mumley, the designated Executive at Region 2, already concurs; we are just waiting for the written confirmation.

Did Sheena send you the list of sites?

Gayleen

From: Joshi, Bhaskar@DOT [mailto:bhaskar.joshi@dot.ca.gov]
Sent: Thursday, August 16, 2018 9:12 AM
To: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>; Dhillon, Sheena@Waterboards <Sheena.Dhillon@waterboards.ca.gov>

Cc: Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>; Lichten, Keith@Waterboards <Keith.Lichten@waterboards.ca.gov>
Subject: RE: TMDL letter

Thanks
We will wait
It will help to plan this seasons efforts

From: Perreira, Gayleen@Waterboards [mailto:Gayleen.Perreira@waterboards.ca.gov]
Sent: Thursday, August 16, 2018 8:40 AM
To: Joshi, Bhaskar@DOT <bhaskar.joshi@dot.ca.gov>; Dhillon, Sheena@Waterboards <Sheena.Dhillon@waterboards.ca.gov>
Cc: Mumley, Thomas@Waterboards <Thomas.Mumley@waterboards.ca.gov>; Lichten, Keith@Waterboards <Keith.Lichten@waterboards.ca.gov>
Subject: RE: TMDL letter

Bhaskar,

The letter is ready, but we're waiting on Region 2 Executive to provide a written approval.

Gayleen

From: Joshi, Bhaskar@DOT [mailto:bhaskar.joshi@dot.ca.gov]
Sent: Thursday, August 16, 2018 8:25 AM
To: Dhillon, Sheena@Waterboards <Sheena.Dhillon@waterboards.ca.gov>
Cc: Perreira, Gayleen@Waterboards <Gayleen.Perreira@waterboards.ca.gov>
Subject: TMDL letter

Hello Sheena , Good day!
When could we expect the letter

Regards

Bhaskar Joshi, Ph.D, P.E.
Office Chief-Storm Water Program Development
Division of Environmental Analysis
California Department of Transportation
Desk: 916-653-5240
Cell:
Fax: 916-653-6366

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