October 2016

# California Department of Transportation

# Monitoring Results Report: Fiscal Year 2015–16

CTSW-RT-16-312.01.02

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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 2015–16.

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## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AMS | Applied Marine Sciences |
| ASBS | Areas of Special Biological Significance |
| Basin Plan | Water Quality Control Plan |
| BMP | Best Management Practice |
| Caltrans | California Department of Transportation |
| CEDEN | California Environmental Data Exchange Network |
| CTR | California Toxics Rule |
| CVSC | Coachella Valley Stormwater Channel |
| MRR | Monitoring Results Report |
| NPDES | National Pollutant Discharge Elimination System |
| NWQ | Natural Water Quality |
| ORA | Ocean Receiving Area |
| ORW | Ocean Receiving Water |
| Permit | Caltrans NPDES Statewide Storm Water Permit Order No. 2012-0011-DWQ |
| PFEIR | 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 |
| QA/QC | Quality Assurance/Quality Control |
| QAPP | Quality Assurance Project Plan |
| RMG | Regional Monitoring Group |
| Regional Water Board | Regional Water Quality Control Board |
| SCCWRP | Southern California Coastal Water Research Project |
| Site ID | Site Identifier |
| SMARTS | Storm Water Multiple Application and Report Tracking System |
| State Water Board | State Water Resources Control Board |
| SWAMP | Surface Water Ambient Monitoring Program |
| TMDL | Total Maximum Daily Load |
| 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 2015–16 season, 104 Tier 1 sites were actively monitored by Caltrans. These sites consisted of:

- ASBS Monitoring Program, 86 sites
- TMDL Monitoring Program, 18 sites

A description of the changes to the number of sites that occurred from the previous MRR are listed in Appendix A. The total number of Tier 1 sites exceeded the NPDES Permit requirement of 100; therefore, no Tier 2 sites were monitored during the 2015–16 season. In addition to these 104 Tier 1 sites, Caltrans also entered into cooperative agreements. For the 2015–16 season, Caltrans participated in 14 cooperative agreements in 13 TMDL watersheds. Some of these cooperative agreements include provisions to perform monitoring activities related to adopted TMDLs. Monitoring under cooperative agreements occurred at 124 sites as stated in the cooperative stakeholder group monitoring reports that were available as of this report date.

## 1.3 PRESENTATION OF WATER QUALITY DATA

Effluent and receiving water quality monitoring data for storm events successfully monitored are presented in Section 2 for ASBS sites and in Section 3 for TMDL sites. Effluent monitoring includes discharges from both outfalls and Best Management Practices (BMPs). Water quality data for each site are provided in a table. Data for each constituent analyzed are reported as they were received from the analytical laboratories. 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. 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 2015–16 season. A summary of monitoring activities conducted under cooperative agreements and the available monitoring reports are presented in Appendix G.

### 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 201 in Caltrans District 7 is identified as Site 7-201. 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 201 exists in Caltrans District 6 (Site 6-201) and in Caltrans District 7 (Site 7-201).

### 1.3.2 SWAMP Comparability

All monitoring during the 2015–16 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 monitoring program, samples marked as quality assurance/quality control (QA/QC) are only used for QA/QC analysis. These ASBS QA/QC results are not included in the data tables in this MRR. Similarly, Caltrans is using the same approach this year for samples marked as QA/QC under the TMDL monitoring program. In the previous MRR, a TMDL sample value and field duplicate value would be averaged together. This year, only the sample values are reported in the data tables, and the QA/QC values are included in Appendix H.

## 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 the California Environmental Data Exchange Network (CEDEN). However, at the present time, some technical problems exist with the SMARTS system that prevents Caltrans from uploading stormwater monitoring data. Therefore, Caltrans has opted to (1) upload all monitoring data to the CEDEN system, and (2) provide all monitoring data in a spreadsheet as an appendix to this MRR. The data upload to CEDEN is expected to be completed by fall 2016. All data for the 2015–16 season, including associated QA/QC data, are included in Appendix H.

As noted in last year's MRR, approximately two-thirds of the data collected, i.e., data from both ASBS and TMDL sites, were uploaded to the CEDEN system for the 2014–15 season. The remaining one-third of the data were not uploaded due to technical problems with the CEDEN system. This remaining data are expected to be uploaded along with the data for the 2015–16 season which again is expected to be completed by fall 2016.

### 1.4.1 Limitations of the Data

All data (i.e., data from both ASBS and TMDL sites) for the 2015–16 season have been reviewed. However, not all data have been finalized due to the delayed submittal of some electronic data deliverables. 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.

# Section 2
# ASBS MONITORING

## 2.1 2015–16 ASBS MONITORING SUMMARY

A summary of the 2015–16 monitoring effort at ASBS sites is provided below:

### Northern California ASBS Regional Monitoring Group

| | |
|---|---|
| **ASBS 05**<br>Kelp Bed at Saunders Reef | Caltrans conducted monitoring activities at 10 outfall sites, 1 ocean receiving water site, and 1 ocean reference area site.<br><br>At the ocean receiving water site:<br>• the targeted number of storm events (3) for 2015–16 was captured<br>• 28 analyses were performed for toxicity<br>• all 28 toxicity results were "Pass"<br>• 108 analyses were performed for general constituents (e.g., TSS, ammonia, etc.), metals, and organics<br>• 97 of the 108 analyses for general constituents, metals, and organics were at or below the natural water quality values |
| **ASBS 08**<br>Redwoods National Park | Caltrans conducted monitoring activities at 7 outfall sites, 1 ocean receiving water site, and 1 ocean reference area site.<br><br>At the ocean receiving water site:<br>• only 1 of the targeted number of storm events (3) for 2015–16 was captured<br>• 4 analyses were performed for toxicity<br>• all 4 toxicity results were "Pass"<br>• 36 analyses were performed for general constituents (TSS, ammonia, etc.), metals, and organics<br>• 31 of the 36 analyses for general constituents, metals, and organics were at or below the natural water quality values |

## Central Coast ASBS Regional Monitoring Group

| | |
|---|---|
| **ASBS 09**<br>James V. Fitzgerald Marine Reserve | Caltrans conducted monitoring activities at 1 outfall site and 1 ocean receiving water site.<br><br>At the ocean receiving water site:<br>• only 2 of the targeted number of storm events (3) for 2015–16 was captured<br>• 20 analyses were performed for toxicity<br>• 16 of the 20 toxicity results were "Pass"<br>• 76 analyses were performed for general constituents (TSS, ammonia, etc.), metals, and organics<br>• 73 of the 76 analyses for general constituents, metals, and organics were at or below the natural water quality values |
| **ASBS 15**<br>Ano Nuevo Point and Island | Caltrans conducted monitoring activities at 5 outfall sites and 1 ocean receiving water site.<br><br>At the ocean receiving water site:<br>• only 2 of the targeted number of storm events (3) for 2015–16 was captured<br>• 20 analyses were performed for toxicity<br>• all 20 toxicity results were "Pass"<br>• 83 analyses were performed for general constituents (TSS, ammonia, etc.), metals, and organics<br>• 73 of the 83 analyses for general constituents, metals, and organics were at or below the natural water quality values |
| **ASBS 34**<br>Carmel Bay | Caltrans conducted monitoring activities at 2 outfall sites and 1 ocean receiving water site.<br><br>At the ocean receiving water site:<br>• the targeted number of storm events (3) for 2015–16 was captured<br>• 30 analyses were performed for toxicity<br>• all 30 toxicity results were "Pass"<br>• 125 analyses were performed for general constituents (TSS, ammonia, etc.), metals, and organics<br>• the natural water quality values to be applied to this ASBS are still under consideration; therefore no comparisons are made |

### Southern California ASBS Regional Monitoring Group

| | |
|---|---|
| **ASBS 24**<br>Mugu Lagoon to Latigo Point | Caltrans conducted monitoring activities at 47 outfall sites and 1 ocean receiving water site.<br><br>No storm events were successfully captured for the entire season because stormwater runoff from the coupled outfall site never reached the ocean receiving water site due to the buildup of a sand berm. |
| **ASBS 33**<br>Irvine Coast Marine Life Refuge | Caltrans conducted monitoring activities at 5 outfall sites and 1 ocean receiving water site.<br><br>• the targeted number of storm events (3) for 2015–16 was captured<br>• 24 analyses were performed for toxicity<br>• all 24 toxicity results were "Pass"<br>• 108 analyses were performed for general constituents (TSS, ammonia, etc.), metals, and organics<br>• 75 of the 108 analyses for general constituents, metals, and organics were at or below the natural water quality values |

## 2.2 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. 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 participated in the three ASBS Regional Monitoring Groups (RMGs): Northern California (No. CA), Central Coast (Ce. Coast), and Southern California (So. CA). Additional information on the RMGs is provided in Appendix B.

Attachment III of the NPDES Permit lists the 77 ASBS high-priority discharge locations to be monitored. These 77 high-priority discharge locations are located in seven ASBS. Subsequent to site reconnaissance surveys, Caltrans determined that 27 of the 77 locations were unsuitable for monitoring due to safety or access limitations. Caltrans has proposed to the State Water Resources Control Board (State Water Board) alternate monitoring locations near the original locations. An amendment to the NPDES Permit with these alternate locations has been adopted. Table 2.01 lists the seven ASBS, the abbreviated ASBS names that will be used throughout this MRR, and the corresponding RMG.

Table 2.01. ASBS with Caltrans Discharges

| ASBS No. | ASBS Name | Name Used in this MRR | RMG |
|---|---|---|---|
| 5 | Kelp Beds at Saunders Reef | Saunders | Northern California (No. CA) |
| 8 | Redwood National Park | Redwood | Northern California (No. CA) |
| 9 | James V. Fitzgerald Marine Reserve | Fitzgerald | Central Coast (Ce. Coast) |
| 15 | Ano Nuevo Point and Island | Ano Nuevo | Central Coast (Ce. Coast) |
| 24 | Mugu Lagoon to Latigo Point | Mugu to Latigo | Southern California (So. CA) |
| 33 | Irvine Coast Marine Life Refuge | Irvine Coast | Southern California (So. CA) |
| 34 | Carmel Bay | Carmel Bay | Central Coast (Ce. Coast) |

ASBS outfalls are classified as either coupled or uncoupled outfalls. Coupled outfalls are associated with ocean receiving water (ORW) sites and uncoupled outfalls 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 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 Storm 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 | 3 | See Note 2 | ✓ |

Notes:

1. A post-storm sample refers to a sample collected during, or immediately after, a storm event.
2. Pre-storm ORA samples were collected during the first year of monitoring in the No. CA RMG area. Pre-storm ORA samples were not collected at Central Coast or So. CA RMG ORA sites. There is no requirement to collect pre-storm samples at ORA sites—pre-storm ORA samples are not a part of the compliance flowchart discussed in Section 2.3.1. Therefore, pre-storm ORA samples were not collected after the first year of monitoring.

The constituent lists vary among RMG areas, and the constituent lists are based on the ASBS Special Protections, the California Ocean Plan, and the QAPPs for each RMG. The constituent lists are described further in the Caltrans Quality Assurance Project Plan (Caltrans 2015). ORW samples are only collected when the stormwater runoff from the coupled outfall is observed to reach the ORW site.

Caltrans has entered into data sharing agreements with each of the RMGs. Under these agreements, Caltrans provides the results of its ORW monitoring to the RMGs. Caltrans does not receive ORW data from the other dischargers or the ORA data collected by others. Caltrans receives the calculated natural water quality (NWQ) values, also referred to as the 85$^{th}$ percentile values, which are calculated from ORA data.

Table 2.03 summarizes the monitoring responsibilities by organization with respect to outfall monitoring, ORW monitoring, and ORA monitoring. During the 2015–16 season, Caltrans conducted outfall monitoring and ORW monitoring at its sites within all three RMG areas. Caltrans also conducted ocean reference area monitoring at two sites within the No. CA RMG area: one site for ASBS 5 (Saunders) and one site for ASBS 8 (Redwoods). Caltrans was the only No. CA RMG member conducting monitoring activities. The Ce. Coast RMG monitoring consultant, Applied Marine Sciences (AMS), conducted ORA monitoring within its area. No ORA monitoring was conducted within the So. CA RMG area because ORA monitoring was complete.

Table 2.03. 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:

CT = Caltrans

RMG = Regional Monitoring Group

1. Coupled and uncoupled outfalls.
2. Caltrans monitored two of the eight ORA sites: one for ASBS 5 (Saunders) and one for ASBS 8 (Redwood). Monitoring at the other 6 ORA sites by the other No. CA RMG dischargers has been completed.

Table 2.04 summarizes which organizations prepared the reports for outfall monitoring, ORW monitoring, and ORA monitoring results. The Ce. Coast RMG monitoring consultant, AMS, is in the process of preparing the final report for the dischargers in the RMG. Appendix B provides additional information on monitoring and reporting by organizations for previous seasons.

Table 2.04. 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, 2] | In progress[3] | No report[4] |

Notes:

MRR = Monitoring Results Report

1. Caltrans 2015–16 Monitoring Results Report.
2. Caltrans only reports the ORA data it collected at ASBS 5 (Saunders) and 8 (Redwood) in the MRR.
3. The Ce. Coast 2015–16 report will be the final monitoring report and is expected to be completed by August or September 2016.
4. Monitoring is complete.

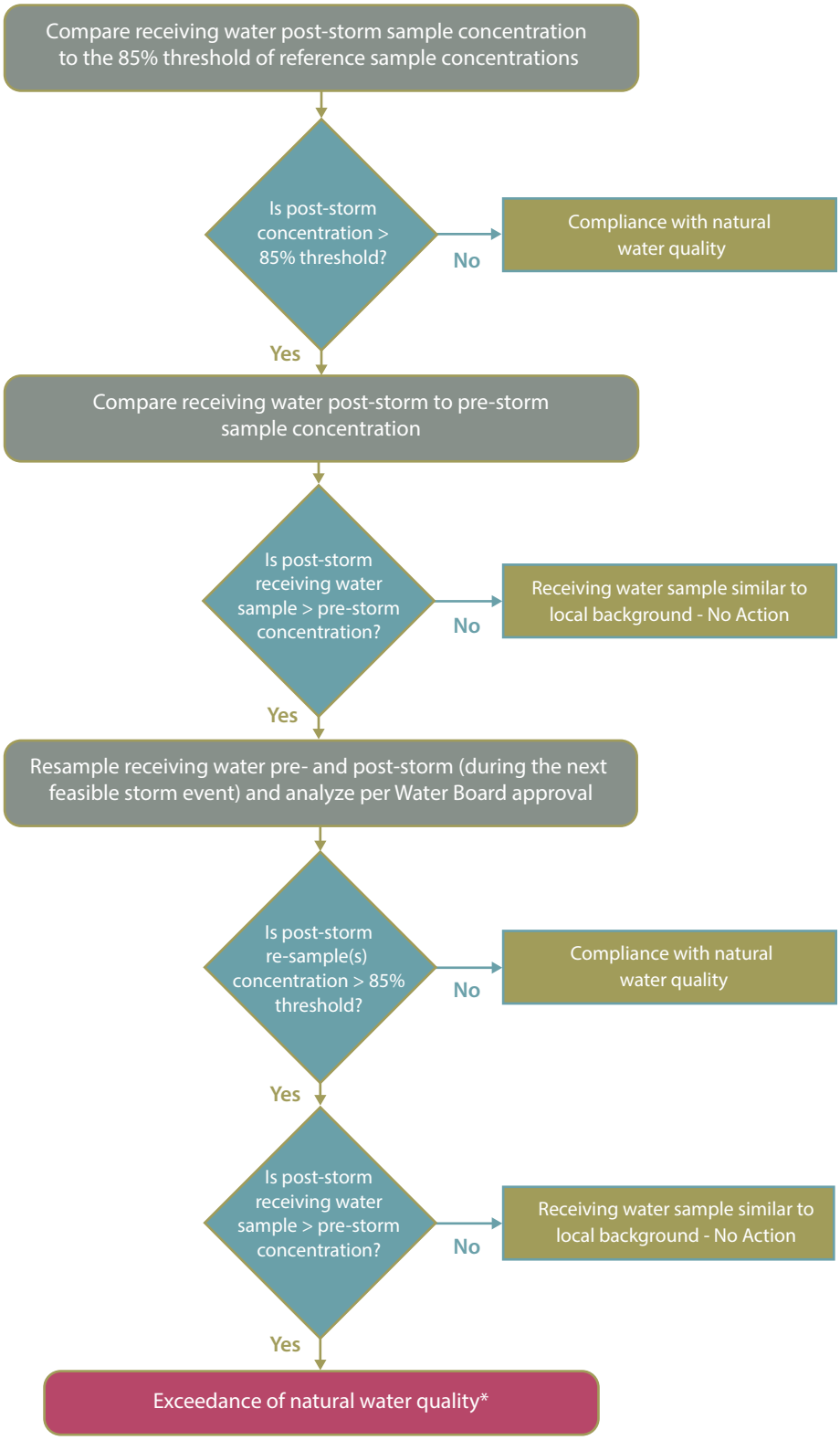
## 2.3 RESULTS

The monitoring results are presented in tables by ASBS. The tables also contain the estimated annual runoff volume if the ASBS site is an outfall. 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. Results from QA/QC samples, e.g., field blanks, field duplicates, etc., are not included in these tables. All water quality data, including QA/QC sample results, are provided in Appendix H.

### 2.3.1 Comparison to Natural Water Quality Values

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 flow chart in Figure 2.1 provides the decision structure for determining 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 flow chart is applied to consecutive pairs of storm events, and a minimum of three storm events are required to apply the flow chart to assess for an exceedance. 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 flow chart is applied five times to six storm events.

The NWQ values are RMG area specific. The No. CA RMG contracted with ADH Environmental to calculate its NWQ values, and the Ce. Coast RMG contracted with Applied Marine Sciences to calculate its NWQ values. The NWQ values for use by the So. CA RMG were calculated by the Southern California Coastal Water Research Project (SCCWRP) under a grant from the State Water Board. Table 2.05 summarizes the NWQ values. Exceedances are based on the cumulative data collected starting with the 2012–13 season through the current 2015–16 season. The data tables in Section 2 contain the 2015–16 data. Data tables in Appendix E include the cumulative data for the seven ORW sites. These cumulative data tables contain the comparisons to NWQ values. Any results in the Appendix E data tables where an exceedance has been identified using the flow chart is highlighted in yellow.




* *When an exceedance of water quality occurs, State Parks 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: Phase II Small MS4 General Permit, Attachment C, IV.A.C; note, the word Department has been replaced with State Parks.*

**Figure 2.1. ASBS Compliance Flow Chart**

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*to facilitate double-sided printing.*

Table 2.05. Natural Water Quality Values[1]

| Analyte | No. CA RMG[2,7] | Ce. Coast RMG[3,8] | So. CA RMG[4,9] |
|---|---|---|---|
| General (mg/L) | | | |
| Ammonia as N | 0.042 | 0 | 0.015 |
| Nitrate as N | 2.77 | 1.15 | 0.34 |
| Oil & Grease | 0 | 0 | 0.5 |
| Ortho-Phosphate | 0.090[5] | 0.16[6] | 0.100[5] |
| TSS | 50.82 | 560.3 | 48 |
| Metals (µg/L) | | | |
| Arsenic | 1.76 | 4.95 | 1.8 |
| Cadmium | 0.06 | 0.24 | 0.15 |
| Chromium | 4.86 | 13.28 | 1.9 |
| Copper | 2.06 | 11.81 | 1.5 |
| Lead | 0.55 | 3.02 | 0.5 |
| Mercury | 0.006 | 0.0259 | 0.0006 |
| Nickel | 4.61 | 26.89 | 1.3 |
| Selenium | 0.03 | 0.34 | 0.003 |
| Silver | 0.13 | 0.37 | 0.08 |
| Zinc | 8.48 | 31.76 | 18.6 |
| Organics (µg/L) | | | |
| Total PAHs[10, 11] | 0.047 | 0.0038 | 0.0125 |
| Total OPs | 0 | 0 | 0.006 |
| Total PPs | 0 | 0 | 0.00675 |
| RMG Specific | | | |
| Urea (µg/L) | NA | 10.45 | NA |
| Fecal Coliform (MPN/100mL) | NA | 1,024 | NA |
| Enterococcus (MPN/100mL) | NA | 477 | NA |

Acronyms:

MPN/100mL = most probable number in 100 milliliters

NA = Not Applicable

OPs = Organophosphorus Pesticides

PAHs = Polynuclear aromatic hydrocarbons

PPs = Pyrethroid Pesticides

TSS = Total Suspended Solids

mg/L = milligrams per liter

µg/L = micrograms per liter

Notes:

1. Some values in this table have been rounded for reporting purposes.
2. Source: Wilde, Peter. "NorCal 85th Percentile." Message to Ram Gupta. June 21, 2016. Email.
3. Source: Hardin, Dane. "Central California Reference Data." Message to Bhaskar Joshi. June 21, 2016. Email.
4. Source: Table 6, *Near-Coastal Water Quality at Reference Sites Following Storm Events* (SCCWRP 2015).
5. The fraction is Total for the No. CA and So. CA RMGs.
6. The fraction is Dissolved for the Ce. Coast RMG.
7. The NWQ values are calculated with non-detects equal to 0.
8. The Central Coast RMG area was divided into 2 sub-regions, north and south, and each sub region has a different set of NWQ values. The NWQ values reported here are for the north sub-region. The NWQ values are calculated with non-detects equal to 0.
9. The NWQ values are calculated with non-detects equal to one-half the method detection limit.
10. The Total PAHs NWQ value is based on the sum of the 13 PAHs listed in the California Ocean Plan.
11. 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).

### 2.3.2 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. There are no criteria for ORA sites.

- A potential storm event must have a 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 05, Saunders | 0.5 |
| ASBS 08, Redwood | 2.0 |
| ASBS 09, Fitzgerald | 0.25 |
| ASBS 15, Ano Nuevo | 0.75 |
| ASBS 24, Mugu to Latigo | 0.1 |
| ASBS 33, Irvine Coast | 0.1 |
| ASBS 34, Carmel Bay | 0.5 |

- 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 which produces 0.1 inches or more rainfall in a 24-hour period.

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

- A RMG's decision to monitor a storm event may be a consideration in qualifying an event for sampling, where a RMG is actively monitoring.

In addition to the mobilization criteria above, a successful storm event capture requires:

- The discharge from the coupled outfall must reach the ocean receiving water site.

The number of storm events forecasted, false starts, and successfully captured for the ASBS Monitoring Program are presented in Table 2.06. At several sites, due to the buildup of sand berms, the runoff from the coupled outfall was not able to reach the ORW site, which is required for a successfully captured storm event. In ASBS 24, the stormwater runoff from the coupled outfall never reached the ocean for the entire season, so no storm events were successfully captured.

Table 2.06. 2015–16 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 5 (Saunders) | 20 | 16 | 1 | 3 |
| ASBS 8 (Redwood) | 26 | 21 | 3 | 2 |
| ASBS 9 (Fitzgerald) | 28 | 24 | 2 | 2 |
| ASBS 15 (Ano Nuevo) | 34 | 30 | 2 | 2 |
| ASBS 34 (Carmel Bay) | 34 | 31 | 0 | 3 |
| ASBS 24 (Mugu to Latigo) | 21 | 21 | 0 | 0[4] |
| ASBS 33 (Irvine Coast) | 13 | 8 | 2 | 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.
4. For the second consecutive season, no storm events were successfully captured due to a sand berm that is preventing runoff from the coupled outfall entering the ocean.

The 2015–16 season is the fourth monitoring season for the ASBS monitoring effort. The NPDES Permit requires a minimum of six storm events to be captured at the ORW sites—see Sections E.2.c.2)a)i)(2)(b)(i) and (iii). The cumulative number of storm events captured over the four monitoring seasons are presented in Table 2.07. Monitoring continued at the ASBS 33 ORW site beyond the minimum of six storm events at the direction of the State Water Board.

Table 2.07. Cumulative Number of Storm Events Captured

| ASBS | Ocean Receiving Water Site ID | 2015–16 Number of Successfully Captured Storm Events | Cumulative Number of Successfully Captured Storm Events | Target Number of Storm Events |
|---|---|---|---|---|
| ASBS 5 (Saunders) | 1-338 | 3 | 6 | 6 |
| ASBS 8 (Redwood) | 1-323 | 1 | 3 | 6 |
| ASBS 9 (Fitzgerald) | 4-342 | 2 | 6 | 6 |
| ASBS 15 (Ano Nuevo) | 4-346 | 2 | 5 | 6 |
| ASBS 34 (Carmel Bay) | 5-305 | 3 | 4 | 6 |
| ASBS 24 (Laguna to Latigo) | 7-369 | 0 | 1 | 6 |
| ASBS 33 (Irvine Coast) | 12-350 | 3 | 9[1] | 6 |

Notes:

1. Monitoring continued at the ASBS 33 ORW site beyond the minimum six storm events at the direction of State Water Board staff.

### 2.3.3 Northern California RMG ASBS Sites

Tables 2.08 and 2.09 summarize the storm event sampling conducted at the Northern California RMG sites during the 2015–16 season. Additional site information is provided in Appendix D.

Table 2.08. Caltrans Monitoring Sites in ASBS 5

| Site ID | Site Name | Monitoring Type[1] | Event 12/18/2015 | Event 1/28/2016 | Event 2/17/2016 |
|---|---|---|---|---|---|
| 1-325 | SAU019A | Outfall, 18"–36" | ✓ | | |
| 1-326 | SAU020A | Outfall, 18"–36" | ✓ | | |
| 1-327 | SAU015 | Outfall, 18"–36" | ✓ | | |
| 1-328 | SAU014 | Outfall, 18"–36" | ✓ | | |
| 1-329 | SAU013A | Outfall, 18"–36" | ✓ | | |
| 1-330 | SAU011A | Outfall, 18"–36" | ✓ | | |
| 1-331 | SAU008 | Outfall, Coupled | ✓ | ✓ | ✓ |
| 1-334 | SAU009A | Outfall, 18"–36" | ✓ | | |
| 1-335 | SAU006A | Outfall, 18"–36" | ✓ | | |
| 1-337 | SAU016A | Outfall, 18"–36" | ✓ | | |
| 1-338 | SAU012-ORW | Ocean Receiving Water | ✓ | ✓ | ✓ |
| 1-340 | Greenwood Creek | Ocean Reference Area | | | ✓ |

A summary of the ASBS 05 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.
- One storm event was captured at the ORA site.

Table 2.09. Caltrans Monitoring Sites in ASBS 8

| Site ID | Site Name | Monitoring Type[1] | Event 2/17/2016 | Event 3/21/2016 |
|---|---|---|---|---|
| 1-317 | RED014 | Outfall, 18"–36" | | ✓ |
| 1-318 | RED015 | Outfall, 18"–36" | | ✓ |
| 1-320 | RED017A | Outfall, 18"–36" | | ✓ |
| 1-321 | RED023 | Outfall, 18"–36" | | ✓ |
| 1-322 | RED028 | Outfall, Coupled | | ✓ |
| 1-323 | RED028-ORW | Ocean Receiving Water | | ✓ |
| 1-324 | RED027 | Outfall, 18"–36" | | ✓ |
| 1-336 | RED018A | Outfall, 18"–36" | | ✓ |
| 1-339 | Nickel Creek | Ocean Reference Area | ✓ | |

A summary of the ASBS 08 season is provided below:

- Only 1 of the targeted 3 storm events for the ORW site was successfully captured.
- Only 1 of the targeted 3 storm events for the coupled outfall was successfully captured.
- The target number of storm events for uncoupled outfalls, 1, was successfully captured.
- One storm event was captured at the ORA site.
- The February 17 storm event did not meet the mobilization criteria for the outfalls and ORW site. However, since there are no mobilization criteria for the ORA site, field crews sampled the ORA site.

Tables 2.10 through 2.30 present the monitoring results for the Northern California RMG sites.

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Table 2.10. Results for ASBS Site 1-325, SAU019A, UO

| Constituent | Units | Event 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 6.4 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 203 |
| Temperature | $^{o}C$ | 12.3 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 49.6 |
| Oil & Grease | mg/L | 1.2 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 6,018 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.

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Table 2.11. Results for ASBS Site 1-326, SAU020A, UO

| Constituent | Units | Event 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 6.53 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 251 |
| Temperature | $^{o}C$ | 12.2 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 53.5 |
| Oil & Grease | mg/L | ND |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 34,905 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.12. Results for ASBS Site 1-327, SAU015, UO

| Constituent | Units | Event 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.3 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 20.7 |
| Temperature | $^{o}C$ | 12.2 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 165.2 |
| Oil & Grease | mg/L | 3 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 10,532 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.

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Table 2.13. Results for ASBS Site 1-328, SAU014, UO

| Constituent | Units | Event 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.5 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 27.0 |
| Temperature | $^{o}C$ | 12.2 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 232.2 |
| Oil & Grease | mg/L | 2.2 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 22,668 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.

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Table 2.14. Results for ASBS Site 1-329, SAU013A, UO

| Constituent | Units | Event 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.6 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 21.6 |
| Temperature | $^{o}C$ | 12.2 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 182.9 |
| Oil & Grease | mg/L | 3.2 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 9,428 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.

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Table 2.15. Results for ASBS Site 1-330, SAU011A, UO

| Constituent | Units | Event #1 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 8.1 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 103 |
| Temperature | $^{o}C$ | 12.1 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 21.1 |
| Oil & Grease | mg/L | ND |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 15,747 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.16. Results for ASBS Site 1-331, SAU008, CO

| Constituent | Units | Event 12/18/2015 | Event 1/28/2016 | Event 2/17/2016 |
|---|---|---|---|---|
| *Field Measurements* | | | | |
| pH | pH Units | 6.72 | 8.6 | 8.42 |
| Salinity | ppt | See Note 1 | See Note 1 | See Note 1 |
| Specific Conductivity | µS/cm | 62.3 | 392 | 64 |
| Temperature | °C | 12.3 | 13.45 | 12.24 |
| *Conventionals* | | | | |
| Total Orthophosphate as P | mg/L | 0.04 | 0.03 | 0.1 |
| Total Suspended Solids | mg/L | 11 | 14.7 | 47.2 |
| Oil & Grease | mg/L | ND | ND | 1.8 |
| Ammonia as N | mg/L | 0.03 | 0.04 | 0.06 |
| Nitrate as N | mg/L | 0.04 | 0.09 | 0.12 |
| *Elements* | | | | |
| Arsenic, total | µg/L | 0.033 | 0.06 | 0.187 |
| Cadmium, total | µg/L | 0.0028 | 0.0082 | 0.0331 |
| Chromium, total | µg/L | 0.9313 | 3.6773 | 3.5733 |
| Copper, total | µg/L | 2.652 | 4.208 | 7.52 |
| Lead, total | µg/L | 0.3687 | 0.3245 | 1.5791 |
| Mercury, total | µg/L | 0.0012 | 0.01057 | 0.01033 |
| Nickel, total | µg/L | 0.9802 | 9.6659 | 3.9184 |
| Selenium, total | µg/L | 0.024 | 0.025 | 0.035 |
| Silver, total | µg/L | ND | 0.04 | ND |
| Zinc, total | µg/L | 11.162 | 4.1956 | 49.5902 |
| *Toxicity* | | | | |
| Urchin | P/F | PASS | PASS | PASS |
| *Organophosphorus Pesticides* | | | | |
| Chlorpyrifos | ng/L | ND | ND | ND |
| Diazinon | ng/L | ND | ND | ND |
| Dimethoate | ng/L | ND | ND | ND |
| Disulfoton | ng/L | ND | ND | ND |
| Malathion | ng/L | ND | ND | ND |
| Methidathion | ng/L | ND | ND | ND |
| Methyl Parathion | ng/L | ND | ND | ND |

Table 2.16. Results for ASBS Site 1-331, SAU008, CO

| Constituent | Units | Event 12/18/2015 | Event 1/28/2016 | Event 2/17/2016 |
|---|---|---|---|---|
| Phorate | ng/L | ND | ND | ND |
| Phosmet | ng/L | ND | ND | ND |
| *Polynuclear Aromatic Hydrocarbons* | | | | |
| Acenaphthene | ng/L | ND | ND | 1 |
| Acenaphthylene | ng/L | ND | ND | 2.5 |
| Anthracene | ng/L | ND | ND | 3.8 |
| Benz(a)anthracene | ng/L | ND | ND | 13.8 |
| Benzo(a)pyrene | ng/L | 2.5 | ND | 6.6 |
| Benzo(b)fluoranthene | ng/L | 2.9 | ND | ND |
| Benzo(e)pyrene | ng/L | 5.3 | 1.5 | 29.3 |
| Benzo(g,h,i)perylene | ng/L | 10.5 | ND | ND |
| Benzo(k)fluoranthene | ng/L | 1.1 | ND | ND |
| Biphenyl | ng/L | ND | ND | 2.9 |
| Chrysene | ng/L | 7.6 | 1.6 | 83.7 |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND |
| Dibenzothiophene | ng/L | ND | ND | 5.2 |
| Dimethylnaphthalene, 2,6- | ng/L | 1 | ND | 3.7 |
| Fluoranthene | ng/L | 6.7 | ND | 21 |
| Fluorene | ng/L | ND | ND | 2.9 |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND | ND |
| Methylnaphthalene, 1- | ng/L | 1.3 | 1.9 | 5.5 |
| Methylnaphthalene, 2- | ng/L | 2.1 | ND | 7 |
| Methylphenanthrene, 1- | ng/L | ND | ND | 6.7 |
| Naphthalene | ng/L | 3 | ND | 8.3 |
| Perylene | ng/L | ND | ND | 1.9 |
| Phenanthrene | ng/L | 5.2 | ND | 18.4 |
| Pyrene | ng/L | 16.2 | ND | 44.1 |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND |
| *Pyrethroid Pesticides* | | | | |
| Bifenthrin | ng/L | ND | ND | ND |
| Cyfluthrin | ng/L | ND | ND | ND |
| Cypermethrin, total | ng/L | ND | ND | ND |

Table 2.16. Results for ASBS Site 1-331, SAU008, CO

| Constituent | Units | Event 12/18/2015 | Event 1/28/2016 | Event 2/17/2016 |
|---|---|---|---|---|
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND | ND | ND |
| Fenpropathrin | ng/L | ND | ND | 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 | $ft^3$ | 24,774 | | |

Abbreviations & Acronyms:

CO = Coupled Outfall

ND = Non-detect

NR = Not recorded

P/F = Pass/Fail

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.17. Results for ASBS Site 1-334, SAU009A, UO

| Constituent | Units | Event 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 8.4 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 67 |
| Temperature | $^{o}C$ | 12.3 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 14.7 |
| Oil & Grease | mg/L | ND |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 16,449 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.18. Results for ASBS Site 1-335, SAU006A, UO

| Constituent | Units | Event 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.7 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 34.8 |
| Temperature | $^{o}C$ | 12.3 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 15.2 |
| Oil & Grease | mg/L | ND |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 17,352 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.19. Results for ASBS Site 1-337, SAU016A, UO

| Constituent | Units | Event 12/18/2015 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 6.66 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 316 |
| Temperature | $^{o}C$ | 12.1 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 54.4 |
| Oil & Grease | mg/L | ND |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 15,145 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Salinity measurements are only reported for the ORW site in the No. CA RMG.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.20. Results for ASBS Site 1-338, SAU012-ORW

| Constituent | Units | Event 12/18/2015 | | Event 1/28/2016 | | Event 2/17/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| *Field Measurements* | | | | | | | |
| pH | pH Units | 7.93 | 7.96 | 7.04 | 7.76 | 7.25 | 7.98 |
| Salinity | ppt | 34.2 | 32.6 | 25.91 | 13.49 | 30.47 | 27.45 |
| Specific Conductivity | µS/cm | 39700 | 38000 | 31200 | 17000 | 35149 | 32167 |
| Temperature | °C | 12.5 | 12.1 | 12.92 | 12.51 | 11.67 | 11.5 |
| *Conventionals* | | | | | | | |
| Total Orthophosphate as P | mg/L | 0.06 | 0.06 | 0.04 | 0.02 | 0.07 | 0.06 |
| Total Suspended Solids | mg/L | 13.2 | 18.5 | 23.3 | 8.2 | 19.5 | 14.1 |
| Oil & Grease | mg/L | 1 | ND | ND | ND | ND | ND |
| Ammonia as N | mg/L | 0.06 | 0.05 | ND | 0.02 | 0.06 | 0.05 |
| Nitrate as N | mg/L | 0.18 | 0.27 | 0.08 | 0.07 | 0.21 | 0.2 |
| *Elements* | | | | | | | |
| Arsenic, total | µg/L | 1.534 | 1.362 | 1.738 | 0.26 | 1.685 | 1.817 |
| Cadmium, total | µg/L | 0.0329 | 0.0248 | 0.0257 | 0.009 | 0.0504 | 0.0454 |
| Chromium, total | µg/L | 0.8125 | 1.1012 | 1.2533 | 0.7276 | 1.3875 | 1.0525 |
| Copper, total | µg/L | 0.391 | 0.679 | 0.736 | 0.954 | 0.68 | 0.698 |
| Lead, total | µg/L | 0.08 | 0.0828 | 0.2135 | 0.1836 | 0.1236 | 0.0953 |
| Mercury, total | µg/L | 0.0009 | 0.0015 | 0.00283 | 0.00648 | 0.00213 | 0.00192 |
| Nickel, total | µg/L | 0.8495 | 1.3074 | 1.5534 | 1.0805 | 1.7137 | 1.2882 |
| Selenium, total | µg/L | 0.02 | 0.031 | 0.034 | 0.03 | 0.037 | 0.036 |

Table 2.20. Results for ASBS Site 1-338, SAU012-ORW

| Constituent | Units | Event 12/18/2015 | | Event 1/28/2016 | | Event 2/17/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| Silver, total | µg/L | 0.07 | 0.07 | 0.09 | 0.06 | 0.04 | 0.05 |
| Zinc, total | µg/L | 0.9907 | 1.4056 | 2.3531 | 9.5324 | 1.5839 | 2.2809 |
| *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 | P/F | PASS | PASS | PASS | PASS | PASS | PASS |
| *Organophosphorus Pesticides* | | | | | | | |
| Chlorpyrifos | ng/L | ND | ND | ND | ND | ND | ND |
| Diazinon | ng/L | ND | ND | ND | ND | ND | ND |
| Dimethoate | ng/L | ND | ND | ND | ND | ND | ND |
| Disulfoton | ng/L | ND | ND | ND | ND | ND | ND |
| Malathion | ng/L | ND | ND | ND | ND | ND | ND |
| Methidathion | ng/L | ND | ND | ND | ND | ND | ND |
| Methyl Parathion | ng/L | ND | ND | ND | ND | ND | ND |
| Phorate | ng/L | ND | ND | ND | ND | ND | ND |
| Phosmet | ng/L | ND | ND | ND | ND | ND | ND |
| Total OPs[1] | ng/L | 0 | 0 | 0 | 0 | 0 | 0 |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | |
| Acenaphthene | ng/L | ND | ND | ND | ND | ND | ND |

Table 2.20. Results for ASBS Site 1-338, SAU012-ORW

| Constituent | Units | Event 12/18/2015 | | Event 1/28/2016 | | Event 2/17/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| Acenaphthylene | ng/L | ND | ND | ND | ND | ND | ND |
| Anthracene | ng/L | 2.3 | ND | ND | ND | ND | ND |
| Benz(a)anthracene | ng/L | 2.7 | ND | ND | ND | ND | 3.3 |
| Benzo(a)pyrene | ng/L | 1.5 | ND | ND | ND | ND | ND |
| Benzo(b)fluoranthene | ng/L | 1.6 | ND | ND | ND | ND | ND |
| Benzo(e)pyrene | ng/L | 1.7 | ND | ND | ND | ND | ND |
| Benzo(g,h,i)perylene | ng/L | ND | 1.4 | ND | ND | ND | ND |
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | ND | ND | ND |
| Biphenyl | ng/L | 1.6 | ND | ND | ND | 1.3 | 1.4 |
| Chrysene | ng/L | 5 | ND | ND | ND | 2.9 | 2.9 |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND | ND | ND |
| Dibenzothiophene | ng/L | 2.2 | ND | ND | ND | ND | ND |
| Dimethylnaphthalene, 2,6- | ng/L | 5.9 | ND | ND | ND | ND | 1.1 |
| Fluoranthene | ng/L | 4.3 | 1.3 | ND | ND | 1.1 | ND |
| Fluorene | ng/L | 1.9 | ND | ND | ND | ND | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND | ND | ND | ND | ND |
| Methylnaphthalene, 1- | ng/L | 4.4 | ND | ND | ND | 1.3 | 1.1 |
| Methylnaphthalene, 2- | ng/L | 4.7 | 1.2 | ND | ND | 1.7 | 1.4 |
| Methylphenanthrene, 1- | ng/L | 11.3 | ND | ND | ND | ND | ND |
| Naphthalene | ng/L | 2.1 | 1.8 | ND | ND | 2.3 | 2 |

Table 2.20. Results for ASBS Site 1-338, SAU012-ORW

| Constituent | Units | Event 12/18/2015 | | Event 1/28/2016 | | Event 2/17/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| Perylene | ng/L | 1.5 | 4.5 | ND | 4.4 | ND | ND |
| Phenanthrene | ng/L | 21.9 | 2 | ND | ND | 2.7 | 1.6 |
| Pyrene | ng/L | 5.1 | 1.1 | ND | ND | 1.8 | ND |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | ND | ND |
| Total PAHs[1] | ng/L | 81.7 | 13.3 | 0 | 4.4 | 15.1 | 14.8 |
| *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/Fenvalerate, total | 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[1] | ng/L | 0 | 0 | 0 | 0 | 0 | 0 |

Abbreviations & Acronyms:

ND = Non-detect

OPs = Organophosphorus Pesticides

ORW = Ocean Receiving Water

Table 2.20. Results for ASBS Site 1-338, SAU012-ORW

| Constituent | Units | Event 12/18/2015 | | Event 1/28/2016 | | Event 2/17/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |

PAHs = Polynuclear Aromatic Hydrocarbons

PPs = Pyrethroid Pesticides

P/F = Pass/Fail

ppt = parts per thousand

$^{o}$C = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.21. Results for ASBS Site 1-340, Greenwood Creek, ORA

| Constituent | Units | Event 2/17/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.34 |
| Salinity | ppt | 20.66 |
| Specific Conductivity | µS/cm | 24658 |
| Temperature | °C | 11.72 |
| *Conventionals* | | |
| Total Orthophosphate as P | mg/L | 0.04 |
| Total Suspended Solids | mg/L | 12.1 |
| Oil & Grease | mg/L | ND |
| Ammonia as N | mg/L | 0.19 |
| Nitrate as N | mg/L | 0.04 |
| *Elements* | | |
| Arsenic, total | µg/L | 1.279 |
| Cadmium, total | µg/L | 0.0172 |
| Chromium, total | µg/L | 0.7029 |
| Copper, total | µg/L | 0.568 |
| Lead, total | µg/L | 0.0928 |
| Mercury, total | µg/L | 0.001 |
| Nickel, total | µg/L | 0.8194 |
| Selenium, total | µg/L | 0.019 |
| Silver, total | µg/L | 0.03 |
| Zinc, total | µg/L | 1.7679 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| Kelp - Germination | P/F | PASS |
| Kelp - Growth | P/F | PASS |
| Mussel | P/F | PASS |
| *Organophosphorus Pesticides* | | |
| Chlorpyrifos | ng/L | ND |
| Diazinon | ng/L | ND |
| Dimethoate | ng/L | ND |
| Disulfoton | ng/L | ND |

Table 2.21. Results for ASBS Site 1-340, Greenwood Creek, ORA

| Constituent | Units | Event 2/17/2016 |
|---|---|---|
| Malathion | ng/L | ND |
| Methidathion | ng/L | ND |
| Methyl Parathion | ng/L | ND |
| Phorate | ng/L | ND |
| Phosmet | ng/L | ND |
| *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(e)pyrene | ng/L | ND |
| Benzo(g,h,i)perylene | ng/L | ND |
| Benzo(k)fluoranthene | ng/L | ND |
| Biphenyl | ng/L | 1.3 |
| Chrysene | ng/L | 3.8 |
| Dibenz(a,h)anthracene | ng/L | ND |
| Dibenzothiophene | ng/L | ND |
| Dimethylnaphthalene, 2,6- | ng/L | 1.1 |
| Fluoranthene | ng/L | ND |
| Fluorene | ng/L | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND |
| Methylnaphthalene, 1- | ng/L | 1 |
| Methylnaphthalene, 2- | ng/L | 1.1 |
| Methylphenanthrene, 1- | ng/L | ND |
| Naphthalene | ng/L | 2 |
| Perylene | ng/L | ND |
| Phenanthrene | ng/L | 1.9 |
| Pyrene | ng/L | ND |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND |
| *Pyrethroids* | | |

Table 2.21. Results for ASBS Site 1-340, Greenwood Creek, ORA

| Constituent | Units | Event 2/17/2016 |
|---|---|---|
| Bifenthrin | ng/L | ND |
| Cyfluthrin | ng/L | ND |
| Cypermethrin, total | ng/L | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND |
| Fenpropathrin | ng/L | ND |
| lamda-Cyhalothrin, total | ng/L | ND |
| cis-Permethrin, total | ng/L | ND |
| trans-Permethrin | ng/L | ND |

Abbreviations & Acronyms:

ND = Non-detect

ORA = Ocean Reference Area

P/F = Pass/Fail

ppt = parts per thousand

$^{o}$C = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.22. Results for ASBS Site 1-317, RED014, UO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.18 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 55.4 |
| Temperature | $^{o}C$ | 9.4 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 24.6 |
| Oil & Grease | mg/L | 2.6 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 30,492 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.

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Table 2.23. Results for ASBS Site 1-318, RED015, UO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 6.98 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 53.1 |
| Temperature | $^{o}C$ | 9.4 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 9.5 |
| Oil & Grease | mg/L | 1 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 83,160 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.

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Table 2.24. Results for ASBS Site 1-320, RED017A, UO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 6.56 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 40.7 |
| Temperature | $^{o}C$ | 10.1 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 3.8 |
| Oil & Grease | mg/L | ND |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 72,072 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.25. Results for ASBS Site 1-321, RED023, UO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.25 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 223 |
| Temperature | $^{o}C$ | 10.9 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 5.8 |
| Oil & Grease | mg/L | ND |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 363,130 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.26. Results for ASBS Site 1-322, RED028, CO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.28 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 171 |
| Temperature | °C | 10.6 |
| *Conventionals* | | |
| Total Orthophosphate as P | mg/L | 0.12 |
| Total Suspended Solids | mg/L | 28.9 |
| Oil & Grease | mg/L | ND |
| Ammonia as N | mg/L | 0.42 |
| Nitrate as N | mg/L | 0.34 |
| *Elements* | | |
| Arsenic, total | µg/L | 0.219 |
| Cadmium, total | µg/L | 0.0218 |
| Chromium, total | µg/L | 1.9725 |
| Copper, total | µg/L | 4.085 |
| Lead, total | µg/L | 2.0125 |
| Mercury, total | µg/L | 0.00834 |
| Nickel, total | µg/L | 6.6017 |
| Selenium, total | µg/L | 0.011 |
| Silver, total | µg/L | 0.03 |
| Zinc, total | µg/L | 17.5127 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Organophosphorus Pesticides* | | |
| Chlorpyrifos | ng/L | ND |
| Diazinon | ng/L | ND |
| Dimethoate | ng/L | ND |
| Disulfoton | ng/L | ND |
| Malathion | ng/L | ND |
| Methidathion | ng/L | ND |
| Methyl Parathion | ng/L | ND |

Table 2.26. Results for ASBS Site 1-322, RED028, CO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| Phorate | ng/L | ND |
| Phosmet | ng/L | ND |
| *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(e)pyrene | ng/L | ND |
| Benzo(g,h,i)perylene | ng/L | ND |
| Benzo(k)fluoranthene | ng/L | ND |
| Biphenyl | ng/L | 2.3 |
| Chrysene | ng/L | ND |
| Dibenz(a,h)anthracene | ng/L | ND |
| Dibenzothiophene | ng/L | ND |
| Dimethylnaphthalene, 2,6- | ng/L | 3.5 |
| Fluoranthene | ng/L | 3.3 |
| Fluorene | ng/L | 1 |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND |
| Methylnaphthalene, 1- | ng/L | ND |
| Methylnaphthalene, 2- | ng/L | 6.8 |
| Methylphenanthrene, 1- | ng/L | 1.3 |
| Naphthalene | ng/L | ND |
| Perylene | ng/L | ND |
| Phenanthrene | ng/L | 5.9 |
| Pyrene | ng/L | 3.3 |
| Trimethylnaphthalene, 2,3,5- | ng/L | 5.6 |
| *Pyrethroid Pesticides* | | |
| Bifenthrin | ng/L | ND |
| Cyfluthrin | ng/L | ND |
| Cypermethrin, total | ng/L | ND |

Table 2.26. Results for ASBS Site 1-322, RED028, CO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| Deltamethrin/Tralomethrin, total | ng/L | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND |
| Fenpropathrin | ng/L | ND |
| lamda-Cyhalothrin, total | ng/L | ND |
| cis-Permethrin, total | ng/L | ND |
| trans-Permethrin | ng/L | ND |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 304,919 |

Abbreviations & Acronyms:

CO = Coupled Outfall

ND = Non-detect

P/F = Pass/Fail

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.27. Results for ASBS Site 1-323, RED028-ORW

| Constituent | Units | Event 3/21/2016 Pre | Event 3/21/2016 Post |
|---|---|---|---|
| *Field Measurements* | | | |
| pH | pH Units | 8.1 | 7.86 |
| Salinity | ppt | 29.5 | 25.9 |
| Specific Conductivity | µS/cm | 35400 | 30300 |
| Temperature | °C | 13.3 | 11.7 |
| *Conventionals* | | | |
| Total Orthophosphate as P | mg/L | 0.04 | 0.07 |
| Total Suspended Solids | mg/L | 10.6 | 44.8 |
| Oil & Grease | mg/L | ND | 1.3 |
| Ammonia as N | mg/L | 0.02 | 0.11 |
| Nitrate as N | mg/L | 0.17 | 0.07 |
| *Elements* | | | |
| Arsenic, total | µg/L | 1.572 | 1.814 |
| Cadmium, total | µg/L | 0.0173 | 0.0227 |
| Chromium, total | µg/L | 1.1025 | 3.468 |
| Copper, total | µg/L | 0.815 | 2.313 |
| Lead, total | µg/L | 0.0736 | 0.2654 |
| Mercury, total | µg/L | 0.00205 | 0.00472 |
| Nickel, total | µg/L | 2.3131 | 5.9296 |
| Selenium, total | µg/L | 0.008 | 0.023 |
| Silver, total | µg/L | 0.09 | 0.09 |
| Zinc, total | µg/L | 2.2686 | 2.7112 |
| *Toxicity* | | | |
| Urchin | P/F | See Note 2 | PASS |
| Kelp - Germination | P/F | See Note 2 | PASS |
| Kelp - Growth | P/F | See Note 2 | PASS |
| Mussel | P/F | See Note 2 | PASS |
| *Organophosphorus Pesticides* | | | |
| Chlorpyrifos | ng/L | ND | ND |
| Diazinon | ng/L | ND | ND |
| Dimethoate | ng/L | ND | ND |

Table 2.27. Results for ASBS Site 1-323, RED028-ORW

| Constituent | Units | Event 3/21/2016 Pre | Event 3/21/2016 Post |
|---|---|---|---|
| Disulfoton | ng/L | ND | ND |
| Malathion | ng/L | ND | ND |
| Methidathion | ng/L | ND | ND |
| Methyl Parathion | ng/L | ND | ND |
| Phorate | ng/L | ND | ND |
| Phosmet | ng/L | ND | ND |
| Total OPs[1] | ng/L | 0 | 0 |
| *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(e)pyrene | ng/L | ND | ND |
| Benzo(g,h,i)perylene | ng/L | ND | ND |
| Benzo(k)fluoranthene | ng/L | ND | ND |
| Biphenyl | ng/L | 6.6 | 3.7 |
| Chrysene | ng/L | ND | ND |
| Dibenz(a,h)anthracene | ng/L | ND | ND |
| Dibenzothiophene | ng/L | ND | ND |
| Dimethylnaphthalene, 2,6- | ng/L | 19.2 | 7.4 |
| Fluoranthene | ng/L | ND | ND |
| Fluorene | ng/L | 1.1 | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND |
| Methylnaphthalene, 1- | ng/L | 32.8 | 7.3 |
| Methylnaphthalene, 2- | ng/L | 84.6 | 39.1 |
| Methylphenanthrene, 1- | ng/L | 1.1 | 1.1 |
| Naphthalene | ng/L | 38.3 | 17.1 |
| Perylene | ng/L | ND | ND |
| Phenanthrene | ng/L | 2 | 2.1 |

Table 2.27. Results for ASBS Site 1-323, RED028-ORW

| Constituent | Units | Event 3/21/2016 Pre | Event 3/21/2016 Post |
|---|---|---|---|
| Pyrene | ng/L | ND | ND |
| Trimethylnaphthalene, 2,3,5- | ng/L | 8.6 | 5.2 |
| Total PAHs[1] | ng/L | 194.3 | 83 |
| *Pyrethroid Pesticides* | | | |
| Bifenthrin | ng/L | ND | ND |
| Cyfluthrin | ng/L | ND | ND |
| Cypermethrin, total | ng/L | ND | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND | ND |
| Fenpropathrin | ng/L | ND | ND |
| lamda-Cyhalothrin, total | ng/L | ND | ND |
| cis-Permethrin, total | ng/L | ND | ND |
| trans-Permethrin | ng/L | ND | ND |
| Total PPs[1] | ng/L | 0 | 0 |

Abbreviations & Acronyms:

CN = Constituent not analyzed for/calculated in the storm event

ND = Non-detect

OPs = Organophosphorus Pesticides

ORW = Ocean Receiving Water

PAHs = Polynuclear Aromatic Hydrocarbons

PPs = Pyrethroid Pesticides

P/F = Pass/Fail

ppt = parts per thousand

$^{o}$C = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the No. CA RMG, non-detect values are set equal to 0.

Table 2.27. Results for ASBS Site 1-323, RED028-ORW

| | | Event | |
|---|---|---|---|
| | | 3/21/2016 | |
| Constituent | Units | Pre | Post |

2. Field crews did not collect the pre-storm event toxicity sample.

Table 2.28. Results for ASBS Site 1-324, RED027, UO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 5.66 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 17 |
| Temperature | $^{o}C$ | 10.1 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 28.5 |
| Oil & Grease | mg/L | ND |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 49,896 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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Table 2.29. Results for ASBS Site 1-336, RED018A, UO

| Constituent | Units | Event 3/21/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.39 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 46.2 |
| Temperature | $^{o}C$ | 9.9 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 46.6 |
| Oil & Grease | mg/L | 1.3 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 44,352 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.

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Table 2.30. Results for ASBS Site 1-339, Nickel Creek, ORA

| Constituent | Units | Event 2/17/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 8.4 |
| Salinity | ppt | 30.5 |
| Specific Conductivity | µS/cm | 34700 |
| Temperature | °C | 11.2 |
| *Conventionals* | | |
| Total Orthophosphate as P | mg/L | 0.08 |
| Total Suspended Solids | mg/L | 47.4 |
| Oil & Grease | mg/L | ND |
| Ammonia as N | mg/L | 0.04 |
| Nitrate as N | mg/L | 0.03 |
| *Elements* | | |
| Arsenic, total | µg/L | 1.721 |
| Cadmium, total | µg/L | 0.0243 |
| Chromium, total | µg/L | 2.6155 |
| Copper, total | µg/L | 1.891 |
| Lead, total | µg/L | 0.3481 |
| Mercury, total | µg/L | 0.00616 |
| Nickel, total | µg/L | 3.6857 |
| Selenium, total | µg/L | 0.017 |
| Silver, total | µg/L | 0.05 |
| Zinc, total | µg/L | 3.852 |
| *Organophosphorus Pesticides* | | |
| Chlorpyrifos | ng/L | ND |
| Diazinon | ng/L | ND |
| Dimethoate | ng/L | ND |
| Disulfoton | ng/L | ND |
| Malathion | ng/L | ND |
| Methidathion | ng/L | ND |
| Methyl Parathion | ng/L | ND |
| Phorate | ng/L | ND |
| Phosmet | ng/L | ND |

Table 2.30. Results for ASBS Site 1-339, Nickel Creek, ORA

| Constituent | Units | Event 2/17/2016 |
|---|---|---|
| *Polynuclear Aromatic Hydrocarbons* | | |
| Acenaphthene | ng/L | ND |
| Acenaphthylene | ng/L | ND |
| Anthracene | ng/L | ND |
| Benz(a)anthracene | ng/L | 4.4 |
| Benzo(a)pyrene | ng/L | ND |
| Benzo(b)fluoranthene | ng/L | ND |
| Benzo(e)pyrene | ng/L | ND |
| Benzo(g,h,i)perylene | ng/L | ND |
| Benzo(k)fluoranthene | ng/L | ND |
| Biphenyl | ng/L | 1.3 |
| Chrysene | ng/L | 3.1 |
| Dibenz(a,h)anthracene | ng/L | ND |
| Dibenzothiophene | ng/L | ND |
| Dimethylnaphthalene, 2,6- | ng/L | 1.4 |
| Fluoranthene | ng/L | ND |
| Fluorene | ng/L | 1.7 |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND |
| Methylnaphthalene, 1- | ng/L | 1.3 |
| Methylnaphthalene, 2- | ng/L | 1.6 |
| Methylphenanthrene, 1- | ng/L | ND |
| Naphthalene | ng/L | 2.4 |
| Perylene | ng/L | ND |
| Phenanthrene | ng/L | 2.7 |
| Pyrene | ng/L | 1.7 |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND |
| *Pyrethroid Pesticides* | | |
| Bifenthrin | ng/L | ND |
| Cyfluthrin | ng/L | ND |
| Cypermethrin, total | ng/L | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND |

Table 2.30. Results for ASBS Site 1-339, Nickel Creek, ORA

| Constituent | Units | Event 2/17/2016 |
|---|---|---|
| Fenpropathrin | ng/L | ND |
| lamda-Cyhalothrin, total | ng/L | ND |
| cis-Permethrin, total | ng/L | ND |
| trans-Permethrin | ng/L | ND |

Abbreviations & Acronyms:

ND = Non-detect

ORA = Ocean Reference Area

P/F = Pass/Fail

ppt = parts per thousand

$^{o}$C = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the No. CA RMG, non-detect values are set equal to 0.

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### 2.3.4 Central California RMG ASBS Sites

Tables 2.31 through 2.33 summarize the storm event sampling conducted at the Central Coast RMG sites during the 2015–16 season. Additional site information is provided in Appendix D.

Table 2.31. Caltrans Monitoring Sites in ASBS 9

| Site ID | Site Name | Monitoring Type[1] | Event 12/3/2015 | Event 3/5/2016 |
|---|---|---|---|---|
| 4-341 | FIT012 | Outfall, Coupled | ✓ | ✓ |
| 4-342 | FIT012-ORW | Ocean Receiving Water | ✓ | ✓ |

A summary of the ASBS 09 season is provided below:

- Only two of the targeted three storm events for the ORW site were successfully captured.
- Only two of the targeted three storm events for the coupled outfall were successfully captured.
- There are no uncoupled outfalls in ASBS 09.

Table 2.32. Caltrans Monitoring Sites in ASBS 15

| Site ID | Site Name | Monitoring Type[1] | Event 1/3/2016 | Event 3/5/2016 |
|---|---|---|---|---|
| 4-343 | ANO001 | Outfall, 18”–36” | ✓ | |
| 4-344 | ANO030 | Outfall, 18”–36” | ✓ | |
| 4-345 | ANO033 | Outfall, Coupled | ✓ | ✓ |
| 4-346 | ANO033-ORW | Ocean Receiving Water | ✓ | ✓ |
| 4-348 | ANO035 | Outfall, 18”–36” | ✓ | |
| 4-353 | ANO002 | Outfall, 18”–36” | ✓ | |

A summary of the ASBS 15 season is provided below:

- Only two of the targeted three storm events for the ORW site were successfully captured.
- Only two of the targeted three storm events for the coupled outfall were successfully captured.
- The target number of storm events (one) for uncoupled outfalls was successfully captured.

Table 2.33. Caltrans Monitoring Sites in ASBS 34

| Site ID | Site Name | Monitoring Type[1] | Event 1/3/2016 | Event 3/5/2016 | Event 3/11/2016 |
|---|---|---|---|---|---|
| 5-303 | CAR006 | Outfall, 18”–36” | ✓ | | |
| 5-304 | CAR007B | Outfall, Coupled | ✓ | ✓ | ✓ |
| 5-305 | CAR007B-ORW | Ocean Receiving Water | ✓ | ✓ | ✓ |

A summary of the ASBS 34 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.

Tables 2.34 through 2.44 present the monitoring results for the Central Coast RMG sites.

Table 2.34. Results for ASBS Site 4-341, FIT012, CO

| Constituent | Units | Event 12/3/2015 | Event 3/5/2016 |
|---|---|---|---|
| *Field Measurements* | | | |
| pH | pH Units | 8.52 | 7.91 |
| Salinity | ppt | See Note 1 | See Note 1 |
| Specific Conductivity | µS/cm | 330 | 240 |
| Temperature | °C | 13.1 | 15.8 |
| *Conventionals* | | | |
| Dissolved Orthophosphate as P | mg/L | 0.05 | 0.03 |
| Total Suspended Solids | mg/L | 35 | 24 |
| Oil & Grease | mg/L | 3 | 3 |
| Ammonia as N | mg/L | 0.09 | ND |
| Nitrate as N | mg/L | 0.3 | 0.1 |
| Urea | mg/L | 0.029 | 0.023 |
| *Elements* | | | |
| Arsenic, total | µg/L | 0.386 | 0.498 |
| Cadmium, total | µg/L | 0.1051 | 0.044 |
| Chromium, total | µg/L | 5.4307 | 3.6548 |
| Copper, total | µg/L | 27.133 | 16.435 |
| Lead, total | µg/L | 3.103 | 1.1798 |
| Mercury, total | µg/L | 0.0186 | 0.00459 |
| Nickel, total | µg/L | 4.7748 | 2.7251 |
| Selenium, total | µg/L | 0.161 | 0.126 |
| Silver, total | µg/L | 0.03 | ND |
| Zinc, total | µg/L | 52.5758 | 37.097 |
| *Toxicity* | | | |
| Urchin | P/F | PASS | FAIL |
| *Organophosphorus Pesticides* | | | |
| Chlorpyrifos | ng/L | ND | ND |
| Chlorpyrifos methyl | ng/L | ND | ND |
| Diazinon | ng/L | ND | ND |
| Dichlofenthion | ng/L | ND | ND |
| Ethion | ng/L | ND | ND |
| Ethoprop (Prophos) | ng/L | ND | ND |

Table 2.34. Results for ASBS Site 4-341, FIT012, CO

| Constituent | Units | Event 12/3/2015 | Event 3/5/2016 |
|---|---|---|---|
| Ethyl Parathion | ng/L | ND | ND |
| Fenchlorphos (Ronnel) | ng/L | ND | ND |
| Fenitrothion | ng/L | ND | ND |
| Fonofos (Dyfonate) | ng/L | ND | ND |
| Malathion | ng/L | ND | ND |
| Methyl Parathion | ng/L | ND | ND |
| Sulfotep | ng/L | ND | ND |
| Thionazin (Thionzin) | ng/L | ND | ND |
| Tokuthion (Prothiofos) | ng/L | ND | ND |
| Trichloronate | ng/L | ND | ND |
| *Polynuclear Aromatic Hydrocarbons* | | | |
| Acenaphthene | ng/L | ND | ND |
| Acenaphthylene | ng/L | ND | ND |
| Anthracene | ng/L | ND | ND |
| Benz(a)anthracene | ng/L | 15 | ND |
| Benzo(a)pyrene | ng/L | 18 | 6 |
| Benzo(b)fluoranthene | ng/L | 32 | 11 |
| Benzo(e)pyrene | ng/L | 37 | 16 |
| Benzo(g,h,i)perylene | ng/L | 36 | 23 |
| Benzo(k)fluoranthene | ng/L | ND | ND |
| Biphenyl | ng/L | ND | ND |
| Chrysene | ng/L | 30 | 13 |
| Dibenz(a,h)anthracene | ng/L | 6 | ND |
| Dibenzothiophene | ng/L | 6 | 8 |
| Dimethylnaphthalene, 2,6- | ng/L | 4 | ND |
| Fluoranthene | ng/L | 35 | 18 |
| Fluorene | ng/L | ND | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | 15 | ND |
| Methylnaphthalene, 1- | ng/L | ND | ND |
| Methylnaphthalene, 2- | ng/L | ND | ND |
| Methylphenanthrene, 1- | ng/L | ND | ND |
| Naphthalene | ng/L | 8 | ND |

Table 2.34. Results for ASBS Site 4-341, FIT012, CO

| Constituent | Units | Event 12/3/2015 | Event 3/5/2016 |
|---|---|---|---|
| Perylene | ng/L | 10 | 5 |
| Phenanthrene | ng/L | 22 | 9 |
| Pyrene | ng/L | 53 | 40 |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND |
| *Pyrethroid Pesticides* | | | |
| Bifenthrin | ng/L | ND | ND |
| Cyfluthrin | ng/L | ND | ND |
| Cypermethrin, total | ng/L | ND | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND | ND |
| Fenpropathrin | ng/L | ND | ND |
| lamda-Cyhalothrin, total | ng/L | ND | ND |
| cis-Permethrin, total | ng/L | ND | ND |
| trans-Permethrin | ng/L | ND | ND |
| *Seasonal Runoff Volume Estimate* | | | |
| Runoff Volume | $ft^3$ | 56,444 | |

Abbreviations & Acronyms:

CO = Coupled Outfall

ND = Non-detect

P/F = Pass/Fail

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the Ce. Coast RMG, non-detect values are set equal to 0.

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Table 2.35. Results for ASBS Site 4-342, FIT012-ORW

| Constituent | Units | Event 12/3/2015 | | Event 3/5/2016 | |
|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post |
| *Field Measurements* | | | | | |
| pH | pH Units | 8.17 | 8.02 | 7.6 | 7.93 |
| Salinity | ppt | 33.8 | 33.6 | 35.3 | 32.7 |
| Specific Conductivity | µS/cm | 40500 | 39900 | 42200 | 39700 |
| Temperature | °C | 13.9 | 13.4 | 13.9 | 14.3 |
| *Conventionals* | | | | | |
| Dissolved Orthophosphate as P | mg/L | 0.02 | 0.02 | 0.03 | 0.02 |
| Total Suspended Solids | mg/L | 6 | 15 | 8 | 16 |
| Oil & Grease | mg/L | ND | ND | ND | ND |
| Ammonia as N | mg/L | ND | ND | ND | ND |
| Nitrate as N | mg/L | 0.2 | 0.2 | 0.4 | 0.3 |
| Urea | mg/L | ND | ND | 0.01 | 0.016 |
| *Elements* | | | | | |
| Arsenic, total | µg/L | 1.41 | 1.51 | 1.445 | 1.524 |
| Cadmium, total | µg/L | 0.0252 | 0.0228 | 0.0451 | 0.0413 |
| Chromium, total | µg/L | 0.6732 | 1.0717 | 0.7916 | 0.8277 |
| Copper, total | µg/L | 0.366 | 0.822 | 1.817 | 0.938 |
| Lead, total | µg/L | 0.0782 | 0.1633 | 0.1783 | 0.1221 |
| Mercury, total | µg/L | 0.000493 | 0.00165 | 0.00101 | 0.00141 |
| Nickel, total | µg/L | 0.7519 | 0.9899 | 0.8128 | 0.8976 |
| Selenium, total | µg/L | 0.016 | 0.02 | 0.014 | 0.028 |
| Silver, total | µg/L | 0.08 | 0.08 | 0.05 | 0.04 |
| Zinc, total | µg/L | 0.8059 | 2.5109 | 1.6071 | 0.8717 |
| *Toxicity* | | | | | |
| Urchin | P/F | PASS | PASS | PASS | PASS |
| Kelp - Germination | P/F | PASS | PASS | PASS | PASS |
| Kelp - Growth | P/F | PASS | FAIL | FAIL | FAIL |
| Mussel - Normal Devel. | P/F | PASS | PASS | FAIL | PASS |
| Mussel - Survival | P/F | PASS | PASS | PASS | PASS |
| *Organophosphorus Pesticides* | | | | | |
| Chlorpyrifos | ng/L | ND | ND | ND | ND |

Table 2.35. Results for ASBS Site 4-342, FIT012-ORW

| Constituent | Units | Event 12/3/2015 | | Event 3/5/2016 | |
|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post |
| Chlorpyrifos methyl | ng/L | ND | ND | ND | ND |
| Diazinon | ng/L | ND | ND | ND | ND |
| Dichlofenthion | ng/L | ND | ND | ND | ND |
| Ethion | ng/L | ND | ND | ND | ND |
| Fenchlorphos (Ronnel) | ng/L | ND | ND | ND | ND |
| Fenitrothion | ng/L | ND | ND | ND | ND |
| Fonofos (Dyfonate) | ng/L | ND | ND | ND | ND |
| Malathion | ng/L | ND | ND | ND | ND |
| Ethyl Parathion | ng/L | ND | ND | ND | ND |
| Methyl Parathion | ng/L | ND | ND | ND | ND |
| Ethoprop (Prophos) | ng/L | ND | ND | ND | ND |
| Sulfotep | ng/L | ND | ND | ND | ND |
| Thionazin (Thionzin) | ng/L | ND | ND | ND | ND |
| Tokuthion (Prothiofos) | ng/L | ND | ND | ND | ND |
| Trichloronate | ng/L | ND | ND | ND | ND |
| Total OPs[1] | ng/L | 0 | 0 | 0 | 0 |
| *Polynuclear Aromatic Hydrocarbons* | | | | | |
| Acenaphthene | ng/L | ND | ND | ND | ND |
| Acenaphthylene | ng/L | ND | ND | ND | ND |
| Anthracene | ng/L | ND | ND | ND | ND |
| 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(e)pyrene | 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 |
| Biphenyl | ng/L | ND | ND | ND | ND |
| Chrysene | ng/L | ND | ND | ND | ND |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND |
| Dibenzothiophene | ng/L | ND | ND | ND | ND |
| Dimethylnaphthalene, 2,6- | ng/L | ND | ND | ND | ND |

Table 2.35. Results for ASBS Site 4-342, FIT012-ORW

| Constituent | Units | Event 12/3/2015 | | Event 3/5/2016 | |
|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post |
| 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 |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND | ND |
| Methylnaphthalene, 2- | ng/L | ND | ND | ND | ND |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND |
| Naphthalene | ng/L | 8 | ND | ND | ND |
| Perylene | ng/L | ND | ND | ND | ND |
| Phenanthrene | ng/L | ND | 4 | ND | ND |
| Pyrene | ng/L | ND | ND | ND | ND |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND |
| Total PAHs[1] | ng/L | 8 | 4 | 0 | 0 |
| *Pyrethroid Pesticides* | | | | | |
| Bifenthrin | ng/L | ND | ND | ND | ND |
| Cyfluthrin | ng/L | ND | ND | ND | ND |
| Cypermethrin, total | ng/L | ND | ND | ND | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND | ND | ND |
| Esfenvalerate/Fenvalerate, total | 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 |
| Total PPs[1] | ng/L | 0 | 0 | 0 | 0 |

Table 2.35. Results for ASBS Site 4-342, FIT012-ORW

| Constituent | Units | Event 12/3/2015 Pre | Event 12/3/2015 Post | Event 3/5/2016 Pre | Event 3/5/2016 Post |
|---|---|---|---|---|---|

Abbreviations & Acronyms:

ND = Non-detect

OPs = Organophosphorus Pesticides

ORW = Ocean Receiving Water

PAHs = Polynuclear Aromatic Hydrocarbons

PPs = Pyrethroid Pesticides

P/F = Pass/Fail

ppt = parts per thousand

$^{o}$C = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the Ce. Coast RMG, non-detect values are set equal to 0.

Table 2.36. Results for ASBS Site 4-343, ANO001, UO

| Constituent | Units | Event 1/3/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.2 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 120 |
| Temperature | $^{o}C$ | 12.0 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 8 |
| Oil & Grease | mg/L | ND |
| *Bacteria* | | |
| Fecal Coliform | MPN/100mL | 1100 |
| Enterococcus | MPN/100mL | 626 |
| *Toxicity* | | |
| Urchin | P/F | FAIL |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 101,593 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the Ce. Coast RMG, non-detect values are set equal to

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Table 2.37. Results for ASBS Site 4-344, ANO030, UO

| Constituent | Units | Event 1/3/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.82 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 140 |
| Temperature | $^{o}C$ | 11.8 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 13 |
| Oil & Grease | mg/L | ND |
| *Bacteria* | | |
| Fecal Coliform | MPN/100mL | 413 |
| Enterococcus | MPN/100mL | 1100 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 32,842 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the Ce. Coast RMG, non-detect values are set equal to

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Table 2.38. Results for ASBS Site 4-345, ANO033, CO

| Constituent | Units | Event 1/3/2016 | Event 3/5/2016 |
|---|---|---|---|
| *Bacteria* | | | |
| Fecal Coliform | MPN/100mL | 8420 | 2755 |
| *Enterococcus* | MPN/100mL | 844 | 24196 |
| *Field Measurements* | | | |
| pH | pH Units | 8.42 | 7.5 |
| Salinity | ppt | See Note 1 | See Note 1 |
| Specific Conductivity | µS/cm | 100 | 340 |
| Temperature | °C | 11.3 | 14.3 |
| *Conventionals* | | | |
| Dissolved Orthophosphate as P | mg/L | 0.02 | 0.13 |
| Total Suspended Solids | mg/L | 183 | 37 |
| Oil & Grease | mg/L | ND | ND |
| Ammonia as N | mg/L | 0.05 | ND |
| Nitrate as N | mg/L | 0.2 | 0.1 |
| Urea | mg/L | 0.012 | 0.014 |
| *Elements* | | | |
| Arsenic, total | µg/L | 2.702 | 1.493 |
| Cadmium, total | µg/L | 0.5865 | 0.0819 |
| Chromium, total | µg/L | 9.8399 | 0.6372 |
| Copper, total | µg/L | 18.513 | 4.707 |
| Lead, total | µg/L | 10.6513 | 0.9726 |
| Mercury, total | µg/L | 0.0248 | 0.00765 |
| Nickel, total | µg/L | 14.1403 | 2.9495 |
| Selenium, total | µg/L | 0.422 | 0.048 |
| Silver, total | µg/L | 0.08 | ND |
| Zinc, total | µg/L | 84.4754 | 18.9248 |
| *Toxicity* | | | |
| Urchin | P/F | PASS | PASS |
| *Organophosphorus Pesticides* | | | |
| Chlorpyrifos | ng/L | ND | ND |
| Chlorpyrifos methyl | ng/L | ND | ND |
| Diazinon | ng/L | ND | ND |

Table 2.38. Results for ASBS Site 4-345, ANO033, CO

| Constituent | Units | Event 1/3/2016 | Event 3/5/2016 |
|---|---|---|---|
| Dichlofenthion | ng/L | ND | ND |
| Ethion | ng/L | ND | ND |
| Fenchlorphos (Ronnel) | ng/L | ND | ND |
| Fenitrothion | ng/L | ND | ND |
| Fonofos (Dyfonate) | ng/L | ND | ND |
| Malathion | ng/L | ND | ND |
| Ethyl Parathion | ng/L | ND | ND |
| Methyl Parathion | ng/L | ND | ND |
| Ethoprop (Prophos) | ng/L | ND | ND |
| Sulfotep | ng/L | ND | ND |
| Thionazin (Thionzin) | ng/L | ND | ND |
| Tokuthion (Prothiofos) | ng/L | ND | ND |
| Trichloronate | ng/L | ND | ND |
| *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 | 9 | ND |
| Benzo(e)pyrene | ng/L | 14 | ND |
| Benzo(g,h,i)perylene | ng/L | 9 | 3 |
| Benzo(k)fluoranthene | ng/L | ND | ND |
| Biphenyl | ng/L | ND | ND |
| Chrysene | ng/L | 10 | ND |
| Dibenz(a,h)anthracene | ng/L | ND | ND |
| Dibenzothiophene | ng/L | 5 | 2 |
| Dimethylnaphthalene, 2,6- | ng/L | ND | ND |
| Fluoranthene | ng/L | 7 | ND |
| Fluorene | ng/L | ND | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND |
| Methylnaphthalene, 1- | ng/L | ND | ND |

Table 2.38. Results for ASBS Site 4-345, ANO033, CO

| Constituent | Units | Event 1/3/2016 | Event 3/5/2016 |
|---|---|---|---|
| Methylnaphthalene, 2- | ng/L | ND | ND |
| Methylphenanthrene, 1- | ng/L | ND | ND |
| Naphthalene | ng/L | ND | ND |
| Perylene | ng/L | 5 | ND |
| Phenanthrene | ng/L | 8 | ND |
| Pyrene | ng/L | 14 | ND |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND |
| *Pyrethroid Pesticides* | | | |
| Bifenthrin | ng/L | ND | ND |
| Cyfluthrin | ng/L | ND | ND |
| Cypermethrin, total | ng/L | ND | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND | ND |
| Fenpropathrin | ng/L | ND | ND |
| lamda-Cyhalothrin, total | ng/L | ND | ND |
| cis-Permethrin, total | ng/L | ND | ND |
| trans-Permethrin | ng/L | ND | ND |
| *Seasonal Runoff Volume Estimate* | | | |
| Runoff Volume | $ft^3$ | 20,932 | |

Abbreviations & Acronyms:

CO = Coupled Outfall

ND = Non-detect

P/F = Pass/Fail

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

Table 2.38. Results for ASBS Site 4-345, ANO033, CO

| Constituent | Units | Event 1/3/2016 | Event 3/5/2016 |
|---|---|---|---|

1. Field crews did not take/record this measurement.
2. Consistent with the Ce. Coast RMG, non-detect values are set equal to 0.

Table 2.39. Results for ASBS Site 4-346, ANO033-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | |
|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post |
| *Bacteria* | | | | | |
| Fecal Coliform | MPN/100mL | ND | 405 | ND | 240 |
| *Enterococcus* | MPN/100mL | See Note 2 | 521 | ND | 7701 |
| *Field Measurements* | | | | | |
| pH | pH Units | 8.23 | 7.81 | 7.7 | 7.5 |
| Salinity | ppt | 35.4 | 33.1 | 35.9 | 26.4 |
| Specific Conductivity | µS/cm | 40900 | 38500 | 43700 | 32500 |
| Temperature | °C | 12.5 | 12.5 | 14.8 | 14 |
| *Conventionals* | | | | | |
| Dissolved Orthophosphate as P | mg/L | 0.03 | 0.03 | 0.05 | 0.07 |
| Total Suspended Solids | mg/L | 19 | 301 | 44 | 27 |
| Oil & Grease | mg/L | ND | ND | ND | ND |
| Ammonia as N | mg/L | ND | ND | ND | ND |
| Nitrate as N | mg/L | 0.4 | 1.9 | 0.4 | 1.2 |
| Urea | mg/L | ND | 0.022 | 0.014 | 0.011 |
| *Elements* | | | | | |
| Arsenic, total | µg/L | 1.496 | 4.659 | 1.725 | 1.982 |
| Cadmium, total | µg/L | 0.047 | 0.5007 | 0.0471 | 0.0645 |
| Chromium, total | µg/L | 0.8781 | 15.661 | 1.9124 | 2.0574 |
| Copper, total | µg/L | 0.517 | 11.678 | 0.646 | 1.351 |
| Lead, total | µg/L | 0.0965 | 3.6845 | 0.1649 | 0.3303 |
| Mercury, total | µg/L | 0.000863 | 0.0129 | 0.00217 | 0.00376 |
| Nickel, total | µg/L | 0.8327 | 24.5697 | 1.6814 | 2.0114 |
| Selenium, total | µg/L | 0.028 | 1.814 | 0.047 | 0.031 |
| Silver, total | µg/L | 0.07 | 0.12 | 0.05 | 0.05 |
| Zinc, total | µg/L | 0.8244 | 33.5847 | 1.4353 | 3.9703 |
| *Toxicity* | | | | | |
| Urchin | P/F | PASS | PASS | PASS | PASS |
| Kelp - Germination | P/F | PASS | PASS | PASS | PASS |
| Kelp - Growth | P/F | PASS | PASS | PASS | PASS |
| Mussel - Normal Devel. | P/F | PASS | PASS | PASS | PASS |

Table 2.39. Results for ASBS Site 4-346, ANO033-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | |
|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post |
| Mussel - Survival | P/F | PASS | PASS | PASS | PASS |
| *Organophosphorus Pesticides* | | | | | |
| Chlorpyrifos | ng/L | ND | ND | ND | ND |
| Chlorpyrifos methyl | ng/L | ND | ND | ND | ND |
| Diazinon | ng/L | ND | ND | ND | ND |
| Dichlofenthion | ng/L | ND | ND | ND | ND |
| Ethion | ng/L | ND | ND | ND | ND |
| Fenchlorphos (Ronnel) | ng/L | ND | ND | ND | ND |
| Fenitrothion | ng/L | ND | ND | ND | ND |
| Fonofos (Dyfonate) | ng/L | ND | ND | ND | ND |
| Malathion | ng/L | ND | ND | ND | ND |
| Ethyl Parathion | ng/L | ND | ND | ND | ND |
| Methyl Parathion | ng/L | ND | ND | ND | ND |
| Ethoprop (Prophos) | ng/L | ND | ND | ND | ND |
| Sulfotep | ng/L | ND | ND | ND | ND |
| Thionazin (Thionzin) | ng/L | ND | ND | ND | ND |
| Tokuthion (Prothiofos) | ng/L | ND | ND | ND | ND |
| Trichloronate | ng/L | ND | ND | ND | ND |
| Total OPs[1] | ng/L | 0 | 0 | 0 | 0 |
| *Polynuclear Aromatic Hydrocarbons* | | | | | |
| Acenaphthene | ng/L | ND | ND | ND | ND |
| Acenaphthylene | ng/L | ND | ND | ND | ND |
| Anthracene | ng/L | ND | ND | ND | ND |
| 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(e)pyrene | 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 |
| Biphenyl | ng/L | ND | ND | ND | ND |
| Chrysene | ng/L | ND | ND | ND | ND |

Table 2.39. Results for ASBS Site 4-346, ANO033-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | |
|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND |
| Dibenzothiophene | ng/L | ND | ND | ND | ND |
| Dimethylnaphthalene, 2,6- | 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 |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND | ND |
| Methylnaphthalene, 2- | ng/L | ND | ND | ND | ND |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND |
| Naphthalene | ng/L | ND | ND | ND | ND |
| Perylene | ng/L | 4 | 15 | 13 | 4 |
| Phenanthrene | ng/L | ND | ND | ND | ND |
| Pyrene | ng/L | ND | ND | ND | ND |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND |
| Total PAHs[1] | ng/L | 4 | 15 | 13 | 4 |
| *Pyrethroids* | | | | | |
| Bifenthrin | ng/L | ND | ND | ND | ND |
| Cyfluthrin | ng/L | ND | ND | ND | ND |
| Cypermethrin, total | ng/L | ND | ND | ND | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND | ND | ND |
| Esfenvalerate/Fenvalerate, total | 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 |
| Total PPs[1] | ng/L | 0 | 0 | 0 | 0 |

Abbreviations & Acronyms:

ND = Non-detect

OPs = Organophosphorus Pesticides

ORW = Ocean Receiving Water

PAHs = Polynuclear Aromatic Hydrocarbons

Table 2.39. Results for ASBS Site 4-346, ANO033-ORW

| Constituent | Units | Event 1/3/2016 Pre | Event 1/3/2016 Post | Event 3/5/2016 Pre | Event 3/5/2016 Post |
|---|---|---|---|---|---|

PPs = Pyrethroid Pesticides

P/F = Pass/Fail

ppt = parts per thousand

$^{o}$C = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the Ce. Coast RMG, non-detect values are set equal to 0.
2. The laboratory lost this sample; therefore, there is no data to report.

Table 2.40. Results for ASBS Site 4-348, ANO035, UO

| Constituent | Units | Event 1/3/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.71 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 150 |
| Temperature | $^{o}C$ | 11.7 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 385 |
| Oil & Grease | mg/L | ND |
| *Bacteria* | | |
| Fecal Coliform | MPN/100mL | 413 |
| Enterococcus | MPN/100mL | 1100 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 30,315 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the Ce. Coast RMG, non-detect values are set equal to

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Table 2.41. Results for ASBS Site 4-353, ANO002, UO

| Constituent | Units | Event 1/3/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.14 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 145 |
| Temperature | $^{o}C$ | 12.4 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 6 |
| Oil & Grease | mg/L | ND |
| *Bacteria* | | |
| Fecal Coliform | MPN/100mL | 202 |
| Enterococcus | MPN/100mL | 301 |
| *Toxicity* | | |
| Urchin | P/F | FAIL |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 12,271 |

Abbreviations & Acronyms:

ND = Non-detect

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.
2. Consistent with the Ce. Coast RMG, non-detect values are set equal to

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Table 2.42. Results for ASBS Site 5-303, CAR006, UO

| Constituent | Units | Event 1/3/2016 |
|---|---|---|
| *Bacteria* | | |
| Fecal Coliform | MPN/100mL | 1450 |
| *Enterococcus* | MPN/100mL | 310 |
| *Field Measurements* | | |
| pH | pH Units | 8.14 |
| Salinity | ppt | See Note 1 |
| Specific Conductivity | µS/cm | 340 |
| Temperature | $^{o}C$ | 11.4 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 24 |
| Oil & Grease | mg/L | 4 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 4,191 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

µS/cm = microsiemens per centimeter

Notes:

1. Field crews did not take/record this measurement.

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Table 2.43. Results for ASBS Site 5-304, CAR007B, CO

| Constituent | Units | Event 1/3/2016 | Event 3/5/2016 | Event 3/11/2016 |
|---|---|---|---|---|
| *Bacteria* | | | | |
| Fecal Coliform | MPN/100mL | 1560 | 393 | 19863 |
| *Enterococcus* | MPN/100mL | 2130 | 520 | 1616 |
| *Field Measurements* | | | | |
| pH | pH Units | 7.32 | 8.4 | 8.25 |
| Salinity | ppt | See Note 1 | See Note 1 | See Note 1 |
| Specific Conductivity | µS/cm | 120 | 20 | 90 |
| Temperature | °C | 9.5 | 15.4 | 12.7 |
| *Conventionals* | | | | |
| Dissolved Orthophosphate as P | mg/L | 0.1 | 0.02 | 0.12 |
| Total Suspended Solids | mg/L | 109 | 151 | 22 |
| Oil & Grease | mg/L | ND | ND | ND |
| Ammonia as N | mg/L | ND | ND | ND |
| Nitrate as N | mg/L | 0.2 | 0.1 | 0.1 |
| Urea | mg/L | 0.062 | ND | 0.026 |
| *Elements* | | | | |
| Arsenic, total | µg/L | 3.304 | 0.422 | 0.327 |
| Cadmium, total | µg/L | 0.8879 | 0.114 | 0.0458 |
| Chromium, total | µg/L | 14.7303 | 3.2915 | 1.6949 |
| Copper, total | µg/L | 100.015 | 25.842 | 9.029 |
| Lead, total | µg/L | 147.4372 | 44.8609 | 6.2139 |
| Mercury, total | µg/L | 0.0187 | 0.00539 | 0.00196 |
| Nickel, total | µg/L | 19.9916 | 2.7095 | 1.9777 |
| Selenium, total | µg/L | 0.183 | 0.057 | ND |
| Silver, total | µg/L | ND | ND | ND |
| Zinc, total | µg/L | 387.8499 | 52.1778 | 18.8735 |
| *Toxicity* | | | | |
| Urchin | P/F | PASS | PASS | PASS |
| *Organophosphorus Pesticides* | | | | |
| Chlorpyrifos | ng/L | ND | ND | ND |
| Chlorpyrifos methyl | ng/L | ND | ND | ND |
| Diazinon | ng/L | ND | ND | ND |

Table 2.43. Results for ASBS Site 5-304, CAR007B, CO

| Constituent | Units | Event 1/3/2016 | Event 3/5/2016 | Event 3/11/2016 |
|---|---|---|---|---|
| Dichlofenthion | ng/L | ND | ND | ND |
| Ethion | ng/L | ND | ND | ND |
| Fenchlorphos (Ronnel) | ng/L | ND | ND | ND |
| Fenitrothion | ng/L | ND | ND | ND |
| Fonofos (Dyfonate) | ng/L | ND | ND | ND |
| Malathion | ng/L | ND | ND | ND |
| Ethyl Parathion | ng/L | ND | ND | ND |
| Methyl Parathion | ng/L | ND | ND | ND |
| Ethoprop (Prophos) | ng/L | ND | ND | ND |
| Sulfotep | ng/L | ND | ND | ND |
| Thionazin (Thionzin) | ng/L | ND | ND | ND |
| Tokuthion (Prothiofos) | ng/L | ND | ND | ND |
| Trichloronate | ng/L | ND | ND | ND |
| *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 | 16 | ND |
| Benzo(a)pyrene | ng/L | ND | 19 | ND |
| Benzo(b)fluoranthene | ng/L | ND | 29 | ND |
| Benzo(e)pyrene | ng/L | 8.1 | 36 | ND |
| Benzo(g,h,i)perylene | ng/L | 6.5 | 35 | ND |
| Benzo(k)fluoranthene | ng/L | ND | 10 | ND |
| Biphenyl | ng/L | ND | ND | ND |
| Chrysene | ng/L | 8.1 | 27 | ND |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND |
| Dibenzothiophene | ng/L | ND | 5 | ND |
| Dimethylnaphthalene, 2,6- | ng/L | ND | 6 | ND |
| Fluoranthene | ng/L | 15 | 48 | ND |
| Fluorene | ng/L | ND | ND | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | 13 | ND |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND |

Table 2.43. Results for ASBS Site 5-304, CAR007B, CO

| Constituent | Units | Event 1/3/2016 | Event 3/5/2016 | Event 3/11/2016 |
|---|---|---|---|---|
| Methylnaphthalene, 2- | ng/L | ND | ND | ND |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND |
| Naphthalene | ng/L | 36 | 6 | ND |
| Perylene | ng/L | ND | 13 | ND |
| Phenanthrene | ng/L | 14 | 31 | ND |
| Pyrene | ng/L | 15 | 60 | ND |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | 84 |
| *Pyrethroids* | | | | |
| Bifenthrin | ng/L | ND | ND | ND |
| Cyfluthrin | ng/L | ND | ND | ND |
| Cypermethrin, total | ng/L | ND | ND | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND | ND | ND |
| Fenpropathrin | ng/L | ND | ND | 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 | $ft^3$ | 6,286 | | |

Abbreviations & Acronyms:

CO = Coupled Outfall

ND = Non-detect

P/F = Pass/Fail

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

Table 2.43. Results for ASBS Site 5-304, CAR007B, CO

| Constituent | Units | Event 1/3/2016 | Event 3/5/2016 | Event 3/11/2016 |
|---|---|---|---|---|

1. Field crews did not take/record this measurement.
2. Consistent with the Ce. Coast RMG, non-detect values are set equal to 0.

Table 2.44. Results for ASBS Site 5-305, CAR007B-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | | Event 3/11/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| *Bacteria* | | | | | | | |
| Fecal Coliform | MPN/100mL | ND | 50 | 7 | 14 | ND | 130 |
| *Enterococcus* | MPN/100mL | See Note 2 | 119 | ND | 161 | ND | 86 |
| *Field Measurements* | | | | | | | |
| pH | pH Units | 8.29 | 7.53 | 7.49 | 7.97 | 7.95 | 8.16 |
| Salinity | ppt | 36.2 | 23.1 | 35.2 | 22.2 | 30.4 | 19.1 |
| Specific Conductivity | µS/cm | 42600 | 25700 | 41400 | 28400 | 35800 | 23800 |
| Temperature | °C | 13.4 | 9.3 | 13.58 | 14.9 | 12.7 | 13.2 |
| *Conventionals* | | | | | | | |
| Dissolved Orthophosphate as P | mg/L | 0.02 | 0.06 | 0.03 | 0.04 | 0.03 | 0.07 |
| Total Suspended Solids | mg/L | 1 | 15 | 2 | 4 | 4 | 13 |
| Oil & Grease | mg/L | ND | ND | ND | ND | ND | ND |
| Ammonia as N | mg/L | ND | ND | ND | ND | ND | ND |
| Nitrate as N | mg/L | 0.3 | 0.3 | 0.4 | 0.3 | 0.4 | 0.4 |
| Urea | mg/L | ND | ND | ND | ND | ND | ND |
| *Elements* | | | | | | | |
| Arsenic, total | µg/L | 1.576 | 0.853 | 1.516 | 1.368 | 1.855 | 0.606 |
| Cadmium, total | µg/L | 0.0185 | 0.1047 | 0.032 | 0.0292 | 0.0558 | 0.1412 |
| Chromium, total | µg/L | 0.1765 | 0.852 | 0.2053 | 0.2573 | 0.1594 | 0.4414 |
| Copper, total | µg/L | 0.104 | 0.902 | 0.123 | 0.216 | 0.192 | 0.736 |

Table 2.44. Results for ASBS Site 5-305, CAR007B-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | | Event 3/11/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| Lead, total | µg/L | 0.065 | 0.4248 | 0.0105 | 0.0679 | 0.0487 | 0.2601 |
| Mercury, total | µg/L | 0.000258 | 0.00853 | ND | 0.00173 | 0.000886 | 0.00481 |
| Nickel, total | µg/L | 0.1976 | 1.28 | 0.2284 | 0.3135 | 0.3731 | 1.0924 |
| Selenium, total | µg/L | 0.013 | 0.347 | 0.019 | 0.015 | 0.015 | 0.044 |
| Silver, total | µg/L | 0.08 | ND | 0.05 | 0.05 | 0.09 | 0.08 |
| Zinc, total | µg/L | ND | 6.0746 | 0.2058 | 0.6086 | 1.9792 | 4.435 |
| *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 | PASS | PASS | PASS |
| Mussel - Survival | P/F | PASS | PASS | PASS | PASS | PASS | PASS |
| *Organophosphorus Pesticides* | | | | | | | |
| Chlorpyrifos | ng/L | ND | ND | ND | ND | ND | ND |
| Chlorpyrifos methyl | ng/L | ND | ND | ND | ND | ND | ND |
| Diazinon | ng/L | ND | ND | ND | ND | ND | ND |
| Dichlofenthion | ng/L | ND | ND | ND | ND | ND | ND |
| Ethion | ng/L | ND | ND | ND | ND | ND | ND |
| Fenchlorphos (Ronnel) | ng/L | ND | ND | ND | ND | ND | ND |
| Fenitrothion | ng/L | ND | ND | ND | ND | ND | ND |

Table 2.44. Results for ASBS Site 5-305, CAR007B-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | | Event 3/11/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| Fonofos (Dyfonate) | ng/L | ND | ND | ND | ND | ND | ND |
| Malathion | ng/L | ND | ND | ND | ND | ND | ND |
| Ethyl Parathion | ng/L | ND | ND | ND | ND | ND | ND |
| Methyl Parathion | ng/L | ND | ND | ND | ND | ND | ND |
| Ethoprop (Prophos) | ng/L | ND | ND | ND | ND | ND | ND |
| Sulfotep | ng/L | ND | ND | ND | ND | ND | ND |
| Thionazin (Thionzin) | ng/L | ND | ND | ND | ND | ND | ND |
| Tokuthion (Prothiofos) | ng/L | ND | ND | ND | ND | ND | ND |
| Trichloronate | ng/L | ND | ND | ND | ND | ND | ND |
| Total OPs[1] | ng/L | 0 | 0 | 0 | 0 | 0 | 0 |
| *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 |

Table 2.44. Results for ASBS Site 5-305, CAR007B-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | | Event 3/11/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| 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 | ND | ND | ND | ND |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | ND | ND |
| Naphthalene | ng/L | ND | ND | ND | ND | ND | ND |
| Perylene | ng/L | ND | ND | ND | ND | ND | ND |
| Phenanthrene | ng/L | ND | ND | ND | ND | ND | ND |
| Pyrene | ng/L | ND | ND | ND | ND | ND | ND |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | ND | ND |
| Total PAHs[1] | ng/L | 0 | 0 | 0 | 0 | 0 | 0 |
| *Pyrethroid Pesticides* | | | | | | | |
| Bifenthrin | ng/L | ND | ND | ND | ND | ND | ND |
| Cyfluthrin | ng/L | ND | ND | ND | ND | ND | ND |

Table 2.44. Results for ASBS Site 5-305, CAR007B-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | | Event 3/11/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| Cypermethrin, total | ng/L | ND | ND | ND | ND | ND | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND | ND | ND | ND | ND |
| Esfenvalerate/Fenvalerate, total | 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[1] | ng/L | 0 | 0 | 0 | 0 | 0 | 0 |

Abbreviations & Acronyms:

ND = Non-detect

OPs = Organophosphorus Pesticides

ORW = Ocean Receiving Water

PAHs = Polynuclear Aromatic Hydrocarbons

PPs = Pyrethroid Pesticides

P/F = Pass/Fail

ppt = parts per thousand

$^{o}$C = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

Table 2.44. Results for ASBS Site 5-305, CAR007B-ORW

| Constituent | Units | Event 1/3/2016 | | Event 3/5/2016 | | Event 3/11/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the Ce. Coast RMG, non-detect values are set equal to 0.
2. The laboratory lost this sample; therefore, there is no data to report.

### 2.3.5 Southern California RMG ASBS Sites

Tables 2.45 and 2.46 summarize the storm event sampling conducted at the Southern California RMG sites during the 2015–16 season. Additional site information is provided in Appendix D.

Table 2.45. Caltrans Monitoring Sites in ASBS 24

| Site ID | Site Name | Monitoring Type[1] | Site ID | Site Name | Monitoring Type[1] |
|---|---|---|---|---|---|
| 7-368 | MUG283 | Outfall, Coupled | 7-366 | MUG150 | Outfall, <18” |
| 7-369 | MUG283RW | Ocean Receiving Water | 7-367 | MUG187 | Outfall, <18” |
| 7-343 | MUG005 | Outfall, >36” | 7-383 | MUG318 | Outfall, 18”–36” |
| 7-345 | MUG010 | Outfall, >36” | 7-370 | MUG346 | Outfall, <18” |
| 7-346 | MUG013 | Outfall, 18”–36” | 7-371 | MUG355 | Outfall, 18”–36” |
| 7-347 | MUG016 | Outfall, <18” | 7-372 | SAD0950 | Outfall, 18”–36” |
| 7-348 | MUG028 | Outfall, 18”–36” | 7-373 | SAD0960 | Outfall, 18”–36” |
| 7-349 | MUG031 | Outfall, 18”–36” | 7-374 | SAD0970 | Outfall, 18”–36” |
| 7-350 | MUG041 | Outfall, 18”–36” | 7-375 | SAD0980 | Outfall, >36” |
| 7-351 | MUG046 | Outfall, <18” | 7-376 | SAD0990 | Outfall, >36” |
| 7-352 | MUG048 | Outfall, <18” | 7-377 | SAD1000 | Outfall, 18”–36” |
| 7-353 | MUG049 | Outfall, 18”–36” | 7-378 | SAD1040 | Outfall, 18”–36” |
| 7-354 | MUG051 | Outfall, 18”–36” | 7-379 | SAD1050 | Outfall, 18”–36” |
| 7-355 | MUG053 | Outfall, 18”–36” | 7-380 | SAD1060 | Outfall, >36” |
| 7-356 | MUG058 | Outfall, <18” | 7-381 | SAD1030 | Outfall, 18”–36” |
| 7-357 | MUG059 | Outfall, 18”–36” | 7-384 | ALT004 | Outfall, 18”–36” |
| 7-358 | MUG061 | Outfall, <18” | 7-385 | ALT005 | Outfall, <18” |
| 7-359 | MUG066 | Outfall, 18”–36” | 7-386 | ALT006 | Outfall, <18” |
| 7-360 | MUG070 | Outfall, <18” | 7-388 | ALT008 | Outfall, <18” |
| 7-361 | MUG073 | Outfall, <18” | 7-389 | ALT009 | Outfall, <18” |
| 7-362 | MUG077 | Outfall, <18” | 7-390 | ALT010 | Outfall, <18” |
| 7-363 | MUG078 | Outfall, <18” | 7-391 | ALT011 | Outfall, <18” |
| 7-364 | MUG135 | Outfall, 18”–36” | 7-393 | ALT017 | Outfall, 18”–36” |
| 7-365 | MUG147 | Outfall, <18” | 7-400[1] | ALT018 | Outfall, <18” |

Notes:

1. Site 7-400 replaces Site 7-344. Monitoring at Site 7-344 was halted due to a landslide in March 2015.

A summary of the ASBS 24 season is provided below:

- No storm events were successfully captured in ASBS 24 due to the buildup of a sand berm in front of the coupled outfall.

Table 2.46. Caltrans Monitoring Sites in ASBS 33

| Site ID | Site Name | Monitoring Type | Event 1/5/2016 | Event 2/17/2016 | Event 3/6/2016 |
|---|---|---|---|---|---|
| 12-350 | IRV007 | Outfall, Coupled | ✓ | ✓ | ✓ |
| 12-351 | IRV007-ORW | Ocean Receiving Water | ✓ | ✓ | ✓ |
| 12-352 | IRV002 | Outfall, >36” | ✓ | | |
| 12-353 | IRV009 | Outfall, >36” | ✓ | | |
| 12-354 | IRV020 | Outfall, >36” | ✓ | | |
| 12-358 | IRV001 | Outfall, 18”–36” | ✓ | | |

A summary of the ASBS 33 season is provided below:

- The target number of storm events, 3, for the ORW site was successfully captured.
- The target number of storm events, 3, for coupled outfalls was successfully captured.
- The target number of storm events, 1, for uncoupled outfalls was successfully captured.

Tables 2.47 through 2.52 present the monitoring results for the ASBS 33 sites.

Table 2.47. Results for ASBS Site 12-350, IRV007, CO

| Constituent | Units | Event 1/5/2016 | Event 2/17/2016 | Event 3/6/2016 |
|---|---|---|---|---|
| *Field Measurements* | | | | |
| pH | pH Units | 7.34 | 6.72 | 6.13 |
| Salinity | ppt | 0.08 | 0.06 | 0.14 |
| Specific Conductivity | µS/cm | 163 | 133.5 | 290.7 |
| Temperature | °C | 14.2 | 15.1 | 15.9 |
| *Conventionals* | | | | |
| Total Orthophosphate as P | mg/L | 0.02 | 0.12 | 0.13 |
| Total Suspended Solids | mg/L | 24 | 18.8 | 43.7 |
| Oil & Grease | mg/L | 3.9 | 3.7 | 3.1 |
| Ammonia as N | mg/L | 1 | 0.45 | 0.56 |
| Nitrate as N | mg/L | 0.3 | 0.58 | 0.56 |
| *Elements* | | | | |
| Arsenic, total | µg/L | 2.973 | 0.504 | 1.918 |
| Cadmium, total | µg/L | 0.1427 | 0.1204 | 0.3066 |
| Chromium, total | µg/L | 4.8951 | 2.0833 | 4.2526 |
| Copper, total | µg/L | 36.432 | 35.48 | 57.311 |
| Lead, total | µg/L | 1.3492 | 0.7389 | 2.7613 |
| Mercury, total | µg/L | 0.0069 | 0.03367 | 0.0274 |
| Nickel, total | µg/L | 2.8953 | 3.097 | 6.6666 |
| Selenium, total | µg/L | 0.123 | 0.066 | 0.079 |
| Silver, total | µg/L | ND | 0.03 | ND |
| Zinc, total | µg/L | 106.6662 | 94.6239 | 223.0378 |
| *Toxicity* | | | | |
| Urchin | P/F | FAIL | See Note 1 | See Note 1 |
| *Organophosphorus Pesticides* | | | | |
| Chlorpyrifos | ng/L | ND | ND | ND |
| Diazinon | ng/L | ND | ND | ND |
| *Polynuclear Aromatic Hydrocarbons* | | | | |
| Acenaphthene | ng/L | ND | 2.5 | ND |
| Acenaphthylene | ng/L | 4.6 | 3.4 | ND |
| Anthracene | ng/L | ND | ND | 14 |
| Benz(a)anthracene | ng/L | 4.5 | 16.9 | 13.4 |

Table 2.47. Results for ASBS Site 12-350, IRV007, CO

| Constituent | Units | Event 1/5/2016 | Event 2/17/2016 | Event 3/6/2016 |
|---|---|---|---|---|
| Benzo(a)pyrene | ng/L | 5.2 | 4.8 | 10.1 |
| Benzo(b)fluoranthene | ng/L | 7.2 | ND | 25.2 |
| Benzo(e)pyrene | ng/L | 14.6 | 18.8 | 28.1 |
| Benzo(g,h,i)perylene | ng/L | 65.4 | ND | 32.4 |
| Benzo(k)fluoranthene | ng/L | 4 | ND | 6.5 |
| Biphenyl | ng/L | 3.6 | 6.2 | 18.7 |
| Chrysene | ng/L | 29.4 | 87.2 | 55.3 |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND |
| Dibenzothiophene | ng/L | ND | 32.6 | 33.6 |
| Dimethylnaphthalene, 2,6- | ng/L | ND | 1.9 | 1.9 |
| Fluoranthene | ng/L | 35.6 | 19.1 | 32.8 |
| Fluorene | ng/L | ND | 4.6 | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | 7.4 | ND | 7.9 |
| Methylnaphthalene, 1- | ng/L | ND | 4.4 | ND |
| Methylnaphthalene, 2- | ng/L | 3.8 | 4.3 | 4.3 |
| Methylphenanthrene, 1- | ng/L | 9.3 | 8 | 15.3 |
| Naphthalene | ng/L | 14.7 | 14.3 | 15 |
| Perylene | ng/L | 3.8 | ND | 4.4 |
| Phenanthrene | ng/L | 23.8 | 14.8 | 19.7 |
| Pyrene | ng/L | 68.3 | 28.9 | 47.5 |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND |
| *Pyrethroid Pesticides* | | | | |
| Bifenthrin | ng/L | ND | ND | ND |
| Cyfluthrin | ng/L | ND | ND | ND |
| Cypermethrin, total | ng/L | ND | ND | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND | ND | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND | ND | ND |
| Fenpropathrin | ng/L | ND | ND | 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* | | | | |

Table 2.47. Results for ASBS Site 12-350, IRV007, CO

| Constituent | Units | Event 1/5/2016 | Event 2/17/2016 | Event 3/6/2016 |
|---|---|---|---|---|
| Runoff Volume | $ft^3$ | | 53,631 | |

Abbreviations & Acronyms:

CO = Coupled Outfall

ND = Non-detect

P/F = Pass/Fail

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Toxicity samples are collected once per season for both coupled and uncoupled outfalls in the So. CA RMG.
2. Consistent with the So. CA RMG, non-detect values are set equal to 1/2 MDL.

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*to facilitate double-sided printing.*

Table 2.48. Results for ASBS Site 12-351, IRV007-ORW

| Constituent | Units | Event 1/5/2016 | | Event 2/17/2016 | | Event 3/6/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| *Field Measurements* | | | | | | | |
| pH | pH Units | 6.79 | 7.27 | 7.88 | 7.65 | 7.58 | 7.82 |
| Salinity | ppt | 34.83 | 32.77 | 34.85 | 34.31 | 34.35 | 33.07 |
| Specific Conductivity | µS/cm | 52810 | 50055 | 53083 | 52125 | 52099 | 50391 |
| Temperature | °C | 15.4 | 14.9 | 10.9 | 19.2 | 18.7 | 16.2 |
| *Conventionals* | | | | | | | |
| Total Orthophosphate as P | mg/L | 0.02 | 0.06 | 0.02 | 0.02 | 0.02 | 0.22 |
| Total Suspended Solids | mg/L | 5.1 | 165.6 | 2.8 | 3.8 | 3.1 | 91.1 |
| Oil & Grease | mg/L | ND | ND | ND | ND | ND | ND |
| Ammonia as N | mg/L | 0.04 | 0.05 | ND | ND | ND | ND |
| Nitrate as N | mg/L | ND | 0.06 | ND | ND | ND | 0.05 |
| *Elements* | | | | | | | |
| Arsenic, total | µg/L | 1.505 | 3.318 | 1.491 | 1.537 | 1.452 | 2.417 |
| Cadmium, total | µg/L | 0.0465 | 7.2197 | 0.0648 | 0.0632 | 0.0557 | 0.7831 |
| Chromium, total | µg/L | 0.2856 | 6.1695 | 0.3014 | 0.2266 | 0.282 | 5.5058 |
| Copper, total | µg/L | 0.217 | 4.401 | 0.292 | 0.276 | 2.27 | 3.99 |
| Lead, total | µg/L | 0.0512 | 1.3711 | 0.0548 | 0.0455 | 0.1777 | 1.16 |
| Mercury, total | µg/L | 0.0018 | 0.0109 | 0.00089 | 0.00061 | ND | 0.008850001 |
| Nickel, total | µg/L | 0.3968 | 27.6453 | 0.4187 | 0.3604 | 0.4034 | 5.6835 |
| Selenium, total | µg/L | 0.024 | 0.667 | 0.011 | 0.015 | 0.02 | 0.076 |

Table 2.48. Results for ASBS Site 12-351, IRV007-ORW

| Constituent | Units | Event 1/5/2016 | | Event 2/17/2016 | | Event 3/6/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| Silver, total | µg/L | 0.06 | 0.06 | 0.1 | 0.11 | 0.05 | 0.06 |
| Zinc, total | µg/L | 0.0815 | 31.1309 | 0.6542 | 0.4392 | 1.7026 | 14.5928 |
| *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 | P/F | PASS | PASS | PASS | PASS | PASS | PASS |
| *Organophosphorus Pesticides* | | | | | | | |
| Chlorpyrifos | ng/L | ND | ND | ND | ND | ND | ND |
| Diazinon | ng/L | ND | ND | ND | ND | ND | ND |
| Total OPs[1] | ng/L | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| *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 | 1.2 | ND | ND | 1.5 |
| Benzo(a)pyrene | ng/L | ND | ND | ND | ND | ND | ND |
| Benzo(b)fluoranthene | ng/L | ND | ND | ND | ND | ND | 2.6 |
| Benzo(e)pyrene | ng/L | ND | ND | ND | ND | ND | 2.9 |
| Benzo(g,h,i)perylene | ng/L | ND | ND | ND | ND | ND | ND |

Table 2.48. Results for ASBS Site 12-351, IRV007-ORW

| Constituent | Units | Event 1/5/2016 | | Event 2/17/2016 | | Event 3/6/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | ND | ND | ND |
| Biphenyl | ng/L | ND | ND | 1.4 | 1.5 | ND | ND |
| Chrysene | ng/L | ND | 1.5 | 3.4 | 2.1 | ND | 4.4 |
| 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 | 1.3 | ND | ND | ND | ND |
| Fluoranthene | ng/L | ND | 1.4 | ND | ND | ND | 2.4 |
| Fluorene | ng/L | ND | ND | 1.1 | ND | ND | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND | ND | ND | ND | ND |
| Methylnaphthalene, 1- | ng/L | ND | ND | 1.3 | 1.2 | ND | ND |
| Methylnaphthalene, 2- | ng/L | ND | ND | 1.6 | 1.4 | ND | ND |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | ND | 1.2 |
| Naphthalene | ng/L | 2.6 | 3 | 3 | 2.8 | ND | ND |
| Perylene | ng/L | ND | ND | ND | ND | ND | 2.6 |
| Phenanthrene | ng/L | ND | 2.1 | 1.5 | 1.3 | ND | 1.3 |
| Pyrene | ng/L | ND | 2.6 | 1.3 | ND | ND | 2.4 |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | ND | ND |
| Total PAHs[1] | ng/L | 14.6 | 21.4 | 23.8 | 19.8 | 12.5 | 29.3 |
| *Pyrethroid Pesticides* | | | | | | | |
| Bifenthrin | ng/L | ND | ND | ND | ND | ND | ND |

Table 2.48. Results for ASBS Site 12-351, IRV007-ORW

| Constituent | Units | Event 1/5/2016 | | Event 2/17/2016 | | Event 3/6/2016 | |
|---|---|---|---|---|---|---|---|
| | | Pre | Post | Pre | Post | Pre | Post |
| 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/Fenvalerate, total | 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[1] | ng/L | 7 | 7 | 7 | 7 | 7 | 7 |

Abbreviations & Acronyms:

ND = Non-detect

OPs = Organophosphorus Pesticides

ORW = Ocean Receiving Water

PAHs = Polynuclear Aromatic Hydrocarbons

PPs = Pyrethroid Pesticides

P/F = Pass/Fail

ppt = parts per thousand

$^{o}$C = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

Table 2.48. Results for ASBS Site 12-351, IRV007-ORW

| Constituent | Units | Event 1/5/2016 Pre | Event 1/5/2016 Post | Event 2/17/2016 Pre | Event 2/17/2016 Post | Event 3/6/2016 Pre | Event 3/6/2016 Post |
|---|---|---|---|---|---|---|---|

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the So. CA RMG, non-detect values are set equal to 1/2 MDL.

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Table 2.49. Results for ASBS Site 12-352, IRV002, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 4.61 |
| Salinity | ppt | 0.90 |
| Specific Conductivity | µS/cm | 1762 |
| Temperature | °C | 15.2 |
| *Conventionals* | | |
| Total Orthophosphate as P | mg/L | 0.02 |
| Total Suspended Solids | mg/L | 299 |
| Oil & Grease | mg/L | 1.6 |
| Ammonia as N | mg/L | 2.71 |
| Nitrate as N | mg/L | 2.25 |
| *Elements* | | |
| Arsenic, total | µg/L | 3.56 |
| Cadmium, total | µg/L | 90.9129 |
| Chromium, total | µg/L | 26.4746 |
| Copper, total | µg/L | 113.951 |
| Lead, total | µg/L | 4.3915 |
| Mercury, total | µg/L | 0.0281 |
| Nickel, total | µg/L | 1657.987 |
| Selenium, total | µg/L | 15.965 |
| Silver, total | µg/L | 0.04 |
| Zinc, total | µg/L | 2659.397 |
| *Toxicity* | | |
| Urchin | P/F | FAIL |
| *Organophosphorus Pesticides* | | |
| Chlorpyrifos | ng/L | ND |
| Diazinon | ng/L | ND |
| *Polynuclear Aromatic Hydrocarbons* | | |
| Acenaphthene | ng/L | ND |
| Acenaphthylene | ng/L | ND |
| Anthracene | ng/L | ND |
| Benz(a)anthracene | ng/L | 1.8 |

Table 2.49. Results for ASBS Site 12-352, IRV002, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| Benzo(a)pyrene | ng/L | 1.7 |
| Benzo(b)fluoranthene | ng/L | ND |
| Benzo(e)pyrene | ng/L | 3.8 |
| Benzo(g,h,i)perylene | ng/L | 22.4 |
| Benzo(k)fluoranthene | ng/L | 2.4 |
| Biphenyl | ng/L | 3.6 |
| Chrysene | ng/L | 10.6 |
| Dibenz(a,h)anthracene | ng/L | ND |
| Dibenzothiophene | ng/L | ND |
| Dimethylnaphthalene, 2,6- | ng/L | ND |
| Fluoranthene | ng/L | 19.4 |
| Fluorene | ng/L | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND |
| Methylnaphthalene, 1- | ng/L | ND |
| Methylnaphthalene, 2- | ng/L | ND |
| Methylphenanthrene, 1- | ng/L | 4.3 |
| Naphthalene | ng/L | 4.7 |
| Perylene | ng/L | 2.9 |
| Phenanthrene | ng/L | 10 |
| Pyrene | ng/L | 30.1 |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND |
| *Pyrethroid Pesticides* | | |
| Bifenthrin | ng/L | ND |
| Cyfluthrin | ng/L | ND |
| Cypermethrin, total | ng/L | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND |
| Fenpropathrin | ng/L | ND |
| lamda-Cyhalothrin, total | ng/L | ND |
| cis-Permethrin, total | ng/L | ND |
| trans-Permethrin | ng/L | ND |
| *Seasonal Runoff Volume Estimate* | | |

Table 2.49. Results for ASBS Site 12-352, IRV002, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| Runoff Volume | $ft^3$ | 83,426 |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

UO = Uncoupled Outfall

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the So. CA RMG, non-detect values are set equal to 1/2

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Table 2.50. Results for ASBS Site 12-353, IRV009, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.10 |
| Salinity | ppt | 0.04 |
| Specific Conductivity | µS/cm | 94.7 |
| Temperature | °C | 14.6 |
| *Conventionals* | | |
| Total Orthophosphate as P | mg/L | 0.06 |
| Total Suspended Solids | mg/L | 27.2 |
| Oil & Grease | mg/L | 1.1 |
| Ammonia as N | mg/L | 1.02 |
| Nitrate as N | mg/L | 0.16 |
| *Elements* | | |
| Arsenic, total | µg/L | 0.972 |
| Cadmium, total | µg/L | 0.3164 |
| Chromium, total | µg/L | 2.2734 |
| Copper, total | µg/L | 7.232 |
| Lead, total | µg/L | 3.0001 |
| Mercury, total | µg/L | 0.007 |
| Nickel, total | µg/L | 3.8369 |
| Selenium, total | µg/L | 0.067 |
| Silver, total | µg/L | 0.01 |
| Zinc, total | µg/L | 51.8166 |
| *Toxicity* | | |
| Urchin | P/F | FAIL |
| *Organophosphorus Pesticides* | | |
| Chlorpyrifos | ng/L | ND |
| Diazinon | ng/L | ND |
| *Polynuclear Aromatic Hydrocarbons* | | |
| Acenaphthene | ng/L | ND |
| Acenaphthylene | ng/L | 3.3 |
| Anthracene | ng/L | ND |
| Benz(a)anthracene | ng/L | ND |

Table 2.50. Results for ASBS Site 12-353, IRV009, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| Benzo(a)pyrene | ng/L | 1.9 |
| Benzo(b)fluoranthene | ng/L | 2.7 |
| Benzo(e)pyrene | ng/L | 4.9 |
| Benzo(g,h,i)perylene | ng/L | 41.1 |
| Benzo(k)fluoranthene | ng/L | ND |
| Biphenyl | ng/L | 2.6 |
| Chrysene | ng/L | 10.4 |
| Dibenz(a,h)anthracene | ng/L | ND |
| Dibenzothiophene | ng/L | ND |
| Dimethylnaphthalene, 2,6- | ng/L | ND |
| Fluoranthene | ng/L | 37 |
| Fluorene | ng/L | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | 4.8 |
| Methylnaphthalene, 1- | ng/L | ND |
| Methylnaphthalene, 2- | ng/L | ND |
| Methylphenanthrene, 1- | ng/L | ND |
| Naphthalene | ng/L | 7 |
| Perylene | ng/L | ND |
| Phenanthrene | ng/L | 13.1 |
| Pyrene | ng/L | 45.8 |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND |
| *Pyrethroid Pesticides* | | |
| Bifenthrin | ng/L | ND |
| Cyfluthrin | ng/L | ND |
| Cypermethrin, total | ng/L | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND |
| Fenpropathrin | ng/L | ND |
| lamda-Cyhalothrin, total | ng/L | ND |
| cis-Permethrin, total | ng/L | ND |
| trans-Permethrin | ng/L | ND |
| *Seasonal Runoff Volume Estimate* | | |

Table 2.50. Results for ASBS Site 12-353, IRV009, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| Runoff Volume | $ft^3$ | 74,488 |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

UO = Uncoupled Outfall

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the So. CA RMG, non-detect values are set equal to 1/2

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Table 2.51. Results for ASBS Site 12-354, IRV020, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 8.12 |
| Salinity | ppt | 0.06 |
| Specific Conductivity | µS/cm | 121 |
| Temperature | °C | 14.5 |
| *Conventionals* | | |
| Total Orthophosphate as P | mg/L | ND |
| Total Suspended Solids | mg/L | 58.9 |
| Oil & Grease | mg/L | 2.6 |
| Ammonia as N | mg/L | 0.86 |
| Nitrate as N | mg/L | 0.16 |
| *Elements* | | |
| Arsenic, total | µg/L | 0.606 |
| Cadmium, total | µg/L | 0.3302 |
| Chromium, total | µg/L | 4.8519 |
| Copper, total | µg/L | 33.315 |
| Lead, total | µg/L | 2.401 |
| Mercury, total | µg/L | 0.0052 |
| Nickel, total | µg/L | 3.4675 |
| Selenium, total | µg/L | 0.038 |
| Silver, total | µg/L | ND |
| Zinc, total | µg/L | 75.4601 |
| *Toxicity* | | |
| Urchin | P/F | FAIL |
| *Organophosphorus Pesticides* | | |
| Chlorpyrifos | ng/L | ND |
| Diazinon | ng/L | ND |
| *Polynuclear Aromatic Hydrocarbons* | | |
| Acenaphthene | ng/L | ND |
| Acenaphthylene | ng/L | 2.6 |
| Anthracene | ng/L | 2.2 |
| Benz(a)anthracene | ng/L | 4 |

Table 2.51. Results for ASBS Site 12-354, IRV020, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| Benzo(a)pyrene | ng/L | 4.9 |
| Benzo(b)fluoranthene | ng/L | 4.2 |
| Benzo(e)pyrene | ng/L | 9.6 |
| Benzo(g,h,i)perylene | ng/L | 36.7 |
| Benzo(k)fluoranthene | ng/L | 7.6 |
| Biphenyl | ng/L | ND |
| Chrysene | ng/L | 20.2 |
| Dibenz(a,h)anthracene | ng/L | ND |
| Dibenzothiophene | ng/L | ND |
| Dimethylnaphthalene, 2,6- | ng/L | ND |
| Fluoranthene | ng/L | 28.1 |
| Fluorene | ng/L | ND |
| Indeno(1,2,3-c,d)pyrene | ng/L | 9.3 |
| Methylnaphthalene, 1- | ng/L | ND |
| Methylnaphthalene, 2- | ng/L | ND |
| Methylphenanthrene, 1- | ng/L | 10.6 |
| Naphthalene | ng/L | 7.6 |
| Perylene | ng/L | 3.5 |
| Phenanthrene | ng/L | 19.2 |
| Pyrene | ng/L | 49 |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND |
| *Pyrethroid Pesticides* | | |
| Bifenthrin | ng/L | ND |
| Cyfluthrin | ng/L | ND |
| Cypermethrin, total | ng/L | ND |
| Deltamethrin/Tralomethrin, total | ng/L | ND |
| Esfenvalerate/Fenvalerate, total | ng/L | ND |
| Fenpropathrin | ng/L | ND |
| lamda-Cyhalothrin, total | ng/L | ND |
| cis-Permethrin, total | ng/L | ND |
| trans-Permethrin | ng/L | ND |
| *Seasonal Runoff Volume Estimate* | | |

Table 2.51. Results for ASBS Site 12-354, IRV020, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| Runoff Volume | $ft^3$ | 144,506 |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

UO = Uncoupled Outfall

ppt = parts per thousand

$^oC$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. Consistent with the So. CA RMG, non-detect values are set equal to 1/2

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Table 2.52. Results for ASBS Site 12-358, IRV001, UO

| Constituent | Units | Event 1/5/2016 |
|---|---|---|
| *Field Measurements* | | |
| pH | pH Units | 7.26 |
| Salinity | ppt | 0.08 |
| Specific Conductivity | µS/cm | 168 |
| Temperature | $^{o}C$ | 14.3 |
| *Conventionals* | | |
| Total Suspended Solids | mg/L | 743.5 |
| Oil & Grease | mg/L | 1.4 |
| *Toxicity* | | |
| Urchin | P/F | PASS |
| *Seasonal Runoff Volume Estimate* | | |
| Runoff Volume | $ft^3$ | 26,816 |

Abbreviations & Acronyms:

UO = Uncoupled Outfall

P/F = Pass/Fail

ppt = parts per thousand

$^{o}C$ = degrees Celsius

$ft^3$ = cubic feet

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

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# Section 3
# TMDL MONITORING

## 3.1 OVERVIEW

The Caltrans TMDL Monitoring Program consists of four projects:

1. District 08 Coachella Valley TMDL Monitoring Project
2. District 11 Chollas Creek TMDL Monitoring Project
3. District 11 Rainbow Creek TMDL Monitoring Project
4. NPDES Permit TMDL Monitoring Project

The four projects identified above consist of monitoring 18 sites, see Table 3.01, and cover the following TMDLs:

- Chollas Creek Diazinon TMDL
- Chollas Creek Dissolved Metals TMDL
- Coachella Valley Stormwater Channel (CVSC) Bacterial Indicator Monitoring TMDL
- Los Angeles River Metals TMDL
- Los Angeles River Watershed Bacteria TMDL
- Malibu Creek and Lagoon Bacteria TMDL
- Malibu Creek and Lagoon Sedimentation and Nutrients TMDL

- Rainbow Creek Total Nitrogen and Total Phosphorus TMDL
- Sacramento-San Joaquin River Delta Estuary Methyl Mercury TMDL
- San Diego Creek and Newport Bay, including Rhine Channel Metals (Cu, Pb, Zn) TMDLs
- San Diego Creek and Upper Newport Bay Cadmium TMDL
- San Diego Creek Watershed Organochlorine Compounds (DDT, Chlordane, PCBs and Toxaphene) TMDL
- San Francisco Bay Mercury TMDL
- San Francisco Bay PCBs TMDL
- San Francisco Bay Area Urban Creeks Diazinon and Pesticides TMDL

Table 3.01. Number of TMDL Monitoring Sites by Project

| Number of Sites | TMDL Monitoring Project |
|---|---|
| 2 | District 08 Coachella Valley TMDL Monitoring Project |
| 3 | District 11 Chollas Creek TMDL Monitoring Project |
| 1 | District 11 Rainbow Creek TMDL Monitoring Project |
| 12 | NPDES Permit TMDL Monitoring Project (Districts 3, 4, 7, 10, and 12) |

### 3.1.1 Sample Collection

The sample collection practices for each monitoring project are provided below:

- The District 8 Coachella Valley TMDL Monitoring Project collects water quality samples via grab samples. A single grab sample is collected for each storm event.
- The District 11 Chollas Creek and District 11 Rainbow Creek TMDL Monitoring Projects both collect water quality samples via a combination of composite and grab samples. Microbiological and oil and grease samples are collected via a grab sample.

- The NPDES Permit TMDL Monitoring Project uses three different strategies to collect water quality samples:

    1. Two storms per season were planned for flow-weighted composite sampling using automatic equipment for the first 3 hours of discharge, with flow data being recorded for the full duration of the event.

    2. One storm per season was planned for flow-weighted composite sampling for the entire storm duration using automatic sampling.

    3. One storm per season was planned for obtaining at least three discrete grab samples collected manually during each of the first 3 hours of the event's discharge and compositing them into a single flow-weighted sample. These manual grab samples are collected during the same storm event described in monitoring strategy #2 above.

## 3.2 RESULTS

The TMDL monitoring results are presented in tables by monitoring project. Each monitoring project requires a different set of constituents to be analyzed for; therefore, the list of constituents varies from site to site. Each table contains event water quality data, field data, and the average flow measured by automatic sampling equipment. Each table also contains applicable TMDL limits, California Toxics Rule (CTR) values, and water quality control plan (Basin Plan) values. All water quality data are also provided in Appendix H.

Where appropriate, water quality results are directly compared with TMDL limits and results higher than the TMDL limits are highlighted in yellow. Since water quality results are concentration-based, direct comparisons of water quality results and TMDL limits are only possible for TMDLs with concentration-based WLAs and not TMDLs with mass-based WLAs. For the 2015-16 monitoring season, direct comparisons to TMDL limits were only possible for diazinon and dissolved metals at the Chollas Creek sites (Sites 11-341 and 11-346) and diazinon at the San Francisco Bay Urban Creeks site (Site 4-350). Only one exceedance occurred at these sites (dissolved copper slightly exceeded the TMDL limit at station 11-341 during the 3/6/2016 event). Direct comparisons were not possible for the San Diego Creek sites (Sites 12-330, 12-336, 12-356) because receiving water flow data required for calculating the concentration-based limits were not available. The TMDL water quality results were not directly compared to CTR values and water quality objectives in basin plans because the CTR values and water quality objectives are not directly applicable to stormwater discharges. However, 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 Tables 3.02 through 3.04. No storm events were successfully captured at the two District 8 Coachella Valley TMDL Monitoring Project sites since flow was never observed.

Table 3.02. 2015–16 Storm Event Sampling Summary for District 11 Chollas Creek TMDL Monitoring Project

| Site ID | Number of Forecasted Events[1] | Number of Non-mobilized Storm Events[2, 5] | Number of False Start Storm Events[3, 5] | Number of Successfully Captured Storm Events[4, 5] |
|---|---|---|---|---|
| 11-341 | 4 | 0 | 1 | 3 |
| 11-344 | 4 | 0 | 4 | 0 |
| 11-346 | 4 | 0 | 3 | 1 |

Notes:

1. Forecasted storm events occurred between December 4, 2015 (completion date of equipment installations), and April 30, 2016 (end of wet season), and met or exceeded 0.25-inch precipitation with a probability of 75 percent or greater.
2. 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.
3. 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.
4. A successfully captured storm event is a storm event that met the criteria and samples were sent to the laboratory for analysis.
5. Number of Non-mobilized Storm Events + Number of False Start Storm Events + Number of Successfully Captured Storm Events = Number of Forecasted Events.

Table 3.03. 2015–16 Storm Event Sampling Summary for District 11 Rainbow Creek TMDL Monitoring Project

| Site ID | Number of Forecasted Events[1] | Number of Non-mobilized Storm Events[2, 5] | Number of False Start Storm Events[3, 5] | Number of Successfully Captured Storm Events[4, 5] |
|---|---|---|---|---|
| 11-332 | 6 | 0 | 1 | 5 |

Notes:

1. Forecasted storms occurred between December 16, 2015 (completion date of installations), and May 6, 2016 (final storm monitored), and met or exceeded 0.25-inch precipitation with a probability of 75 percent or greater.
2. 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.
3. 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.
4. A successfully captured storm event is a storm event that met the criteria and samples were sent to the laboratory for analysis.
5. Number of Non-mobilized Storm Events + Number of False Start Storm Events + Number of Successfully Captured Storm Events = Number of Forecasted Events.

Table 3.04. 2015–16 Storm Event Sampling Summary for NPDES Permit TMDL Monitoring 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] |
|---|---|---|---|---|
| 3-397 | 12 | 8 | 1 | 3 |
| 4-324 | 20 | 18 | 0 | 2 |
| 4-349 | 9 | 5 | 0 | 4 |
| 4-350 | 9 | 5 | 0 | 4 |
| 4-351 | 9 | 5 | 0 | 4 |
| 7-09 | 20 | 16 | 1 | 3 |
| 7-201 | 19 | 16 | 0 | 3 |
| 7-336 | 19 | 16 | 0 | 3 |
| 10-300 | 13 | 10 | 1 | 2 |
| 12-330 | 3 | 0 | 0 | 3 |
| 12-336 | 3 | 0 | 0 | 3 |
| 12-356 | 4 | 0 | 1 | 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 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.

As discussed in Section 3.1.1, three different monitoring strategies were used for the NPDES Permit TMDL Monitoring Project. Table 3.05 summarizes the monitoring strategy at each site for the successful storm events.

Table 3.05. 2015–16 Storm Event Sampling Summary for NPDES Permit TMDL Monitoring Project by Monitoring Strategy

| Site ID | Successful Storm Events | Monitoring Strategy #1[1] | Monitoring Strategies #2 & #3[2, 3] |
|---|---|---|---|
| 3-397 | 3 | 2 | 1 |
| 4-324 | 2 | 1 | 1 |
| 4-349 | 4 | 2 | 2 |
| 4-350 | 4 | 2 | 2 |
| 4-351 | 4 | 2 | 2 |
| 7-09 | 3 | 2 | 1 |
| 7-201 | 3 | 2 | 1 |
| 7-336 | 3 | 2 | 1 |
| 10-300 | 2 | 1 | 1 |
| 12-330 | 3 | 2 | 1 |
| 12-336 | 3 | 2 | 1 |
| 12-356 | 3 | 2 | 1 |

Notes:

1. Monitoring Strategy #1 consists of flow-weighted composite sampling using automatic equipment for the first 3 hours of discharge, with flow data being recorded for the full duration of the event.
2. Monitoring Strategy #2 consists of flow-weighted composite sampling for the entire storm duration using automatic sampling.
3. Monitoring Strategy #3 consists of obtaining at least three discrete grab samples collected manually during each of the first 3 hours of the event's discharge and compositing them into a single flow-weighted sample. These manual grab samples are collected during the same storm event described in Monitoring Strategy #2.

The cumulative number of storm events captured over the past monitoring seasons are presented in Table 3.06. The cumulative number of storm events captured by monitoring strategy for the NPDES Permit TMDL Monitoring Project are presented in Table 3.07.

Table 3.06. Cumulative Number of Storm Events Captured at TMDL Sites

| Station ID | 2015–16 Number of Successfully Captured Storm Events | Cumulative Number of Successfully Captured Storm Events[1] | Target Number of Storm Events[2] |
|---|---|---|---|
| District 08 Coachella Valley TMDL Monitoring Project[3] | | | |
| 8-310 | 0 | 0 | 9 |
| 8-311 | 0 | 0 | 9 |
| District 11 Cholas Creek TMDL Monitoring Project | | | |
| 11-341 | 3 | 6 | 6 |
| 11-344[4,5] | 0 | 0 | 3 |
| 11-346[5] | 1 | 1 | 3 |
| District 11 Rainbow Creek TMDL Monitoring Project | | | |
| 11-332 | 5 | 21 | 12 |
| NPDES Permit TMDL Monitoring Project | | | |
| 3-397 | 3 | 3 | 3 |
| 4-324 | 2 | 11[6] | 12 |
| 4-349 | 4 | 6 | 9 |
| 4-350 | 4 | 5 | 9 |
| 4-351 | 4 | 6 | 9 |
| 7-09 | 3 | 6 | 9 |
| 7-201 | 3 | 7 | 9 |
| 7-336 | 3 | 7 | 9 |
| 10-300 | 2 | 7 | 9 |
| 12-330 | 3 | 8 | 9 |
| 12-336 | 3 | 7 | 9 |
| 12-356[7] | 3 | 7 | 9 |

Notes:

1. Cumulative number of successfully captured storm events is based on storm events captured since the 2012–13 season unless indicated otherwise.
2. The target number of storm events is based on 3 storm events per season.
3. No storm events were successfully captured because flow was never observed in the CVSC.
4. The first storm event was not monitored due to equipment issues.
5. Stormwater runoff infiltrated in the BMP for two events. These storm events were not monitored.
6. Total number of storm events captured include events prior to the 2012–13 season.
7. Stormwater runoff infiltrated in the BMP for one event. This storm event was not monitored.

Table 3.07. Cumulative Number of Storm Events Captured at NPDES Permit TMDL Monitoring Sites by Monitoring Strategy

| Site ID | 2013-16 Successful Storm Events[1] | 2013-16 Monitoring Strategy #1[2] | 2013-16 Monitoring Strategies #2 & #3[3, 4] |
|---|---|---|---|
| 3-397 | 3 | 2 | 1 |
| 4-324 | 2 | 1 | 1 |
| 4-349 | 6 | 2 | 4 |
| 4-350 | 5 | 2 | 3 |
| 4-351 | 6 | 2 | 4 |
| 7-09 | 6 | 4 | 2 |
| 7-201 | 7 | 5 | 2 |
| 7-336 | 7 | 5 | 2 |
| 10-300 | 7 | 4 | 3 |
| 12-330 | 8 | 6 | 2 |
| 12-336 | 7 | 5 | 2 |
| 12-356 | 7 | 5 | 2 |

Notes:

1. Events based on either Monitoring Strategy #1 or Monitoring Strategy #2.
2. Monitoring Strategy #1 consists of flow-weighted composite sampling using automatic equipment for the first 3 hours of discharge, with flow data being recorded for the full duration of the event.
3. Monitoring Strategy #2 consists of flow-weighted composite sampling for the entire storm duration using automatic sampling.
4. Monitoring Strategy #3 consists of obtaining at least three discrete grab samples collected manually during each of the first 3 hours of the event's discharge and compositing them into a single flow-weighted sample. These manual grab samples are collected during the same storm event described in Monitoring Strategy #2.

### 3.2.2 District 8 Coachella Valley TMDL Monitoring Project

The two sites that are a part of the District 8 Coachella Valley TMDL Monitoring Project had an active monitoring task order through December 2015. There are no data to report since flow was never observed in CVSC. After 2 years of monitoring, Caltrans submitted its required monitoring report to the Colorado River Basin Regional Water Board in November 2015. At that time, Caltrans requested to be removed from the TMDL due to lack of connectivity. 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 CVSC due to not enough runoff reaching the channel. The 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. No further work is anticipated at this time until the Regional Water Board makes a determination of exclusion. The Phase I monitoring effort is complete.

### 3.2.3 District 11 Chollas Creek TMDL Monitoring Sites

Table 3.08 presents a summary of the storm event sampling conducted at the District 11 Chollas Creek TMDL Monitoring Project sites during the 2015–16 season. Additional site information is provided in Appendix F. No storm events were successfully captured at Site 11-344. For Storm Event #1, there was an equipment problem that resulted in the failed capture of samples. For Storm Events #2 and #3, the stormwater runoff infiltrated into the BMP. There was no discharge of runoff, i.e., a 100 percent reduction of constituents for these two storm events. Therefore, there were no samples to collect.

Table 3.08. District 11 Chollas Creek TMDL Monitoring Sites[1]

| Site ID | Site Name | Event 1/4/2016 | Event 3/6/2016 | Event 4/10/2016 |
|---|---|---|---|---|
| 11-341 | 28th Street Effluent | ✓ | ✓ | ✓ |
| 11-344 | I-15S/SR94-EFF | | | |
| 11-346 | I-15S/Market-EFF | ✓ | | |

Notes:

1. Two stations monitored last year, 11-100 and 11-342, were not monitored for the 2015–16 season. See Appendix A for details.

Tables 3.09 and 3.10 present the monitoring results for the District 11 Chollas Creek TMDL Monitoring Project sites.

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Table 3.09. Results for Chollas Creek TMDL Monitoring Site 11-341, 28th Street Effluent[7]

| Constituent[1] | Units | Event 1/4/2016 | Event 3/6/2016 | Event 4/10/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | |
| Diazinon | ng/L | ND | ND | ND | 72[2,4] | | 72 |
| Copper, dissolved | µg/L | 6.8 | 13 | 7.1 | 11[3,4] | 12 | 12 |
| Lead, dissolved | µg/L | 0.4 | 0.8 | 0.6 | 52[3,4] | 58 | 58 |
| Zinc, dissolved | µg/L | 12 | 15 | 19 | 97[3,4] | 108 | 108 |
| *Field Measurements* | | | | | | | |
| pH | pH units | 7.57 | 6.89 | 6.99 | | | 6.5 to 8.5 |
| Temperature | °C | 14.4 | 13.78 | 16.2 | | | |
| Specific Conductivity | µS/cm | 120 | 409 | 162.8 | | | |
| Average Flow Rate | gpm | 30 | 0.8 | 37 | | | |
| *Bacteria* | | | | | | | |
| Fecal Coliform | MPN/100mL | 900 | 5000 | 3000 | | | |
| *Conventionals* | | | | | | | |
| Hardness as CaCO3 | mg/L | 26 | 49 | 17 | | | |
| Nitrate as N | mg/L | 0.13 | 0.17 | 0.15 | | | |
| Oil and Grease | mg/L | 2 | 3 | ND | | | |
| Total Dissolved Solids | mg/L | 68[8] | 140 | 72 | | | |
| Total Kjeldahl Nitrogen | mg/L | 0.79 | 1.42 | 0.64 | | | |

Table 3.09. Results for Chollas Creek TMDL Monitoring Site 11-341, 28th Street Effluent[7]

| Constituent[1] | Units | Event 1/4/2016 | Event 3/6/2016 | Event 4/10/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| Total Phosphorus | mg/L | 0.37 | 0.36 | 0.2 | | | |
| Total Suspended Solids | mg/L | 14 | 9 | 18 | | | |
| Total Organic Carbon | mg/L | 8.1 | 20.4 | 11.7 | | | |
| Dissolved Organic Carbon | mg/L | 5.6 | 14.3 | 10.9 | | | |
| *Elements* | | | | | | | |
| Aluminum, total | µg/L | 982.3 | 25.3 | ND | | | |
| Chromium, total | µg/L | 5.2 | 3.7 | 2.5 | | 1605 | |
| Copper, total | µg/L | 11 | 17 | 8.3 | | 13 | |
| Iron, total | µg/L | 1000 | 120 | ND | | | |
| Lead, total | µg/L | 9.4 | 6 | 3.8 | | 72 | |
| Zinc, total | µg/L | 32 | 23 | 19 | | 110 | |
| *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 | | | |

Table 3.09. Results for Chollas Creek TMDL Monitoring Site 11-341, 28th Street Effluent[7]

| Constituent[1] | Units | Event 1/4/2016 | Event 3/6/2016 | Event 4/10/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| 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 | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

PAHs = Polynuclear Aromatic Hydrocarbons

Table 3.09. Results for Chollas Creek TMDL Monitoring Site 11-341, 28th Street Effluent[7]

| Constituent[1] | Units | Event 1/4/2016 | Event 3/6/2016 | Event 4/10/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|

°C = degrees Celsius

gpm = gallons per minute

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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.
3. Chollas Creek Dissolved Copper, Lead and Zinc TMDLs. The concentration-based waste load allocations for dissolved copper, lead and zinc are set as the acute and chronic limits in the CTR times 90 percent and based on statistical measures of hardness. The waste load allocations in this table are for the acute condition and calculated based on an assumed hardness of the receiving water of 90.8 mg/L. Only results greater than the acute values are highlighted.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide

Table 3.09. Results for Chollas Creek TMDL Monitoring Site 11-341, 28th Street Effluent[7]

| Constituent[1] | Units | Event 1/4/2016 | Event 3/6/2016 | Event 4/10/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|

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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at the effluent of a bioswale BMP.

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*to facilitate double-sided printing.*

Table 3.10. Results for Chollas Creek TMDL Site 11-346, I-15S/Market-EFF[7]

| Constituent[1] | Units | Event 1/4/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | |
| Diazinon | ng/L | ND | 72[2,4] | | 72 |
| Copper, dissolved | µg/L | 6.2 | 11[3,4] | 12 | 12 |
| Lead, dissolved | µg/L | 0.2 | 52[3,4] | 58 | 58 |
| Zinc, dissolved | µg/L | 11 | 97[3,4] | 108 | 108 |
| *Field Measurements* | | | | | |
| pH | pH units | 7.14 | | | 6.5 to 8.5 |
| Temperature | °C | 15.05 | | | |
| Specific Conductivity | µS/cm | 83 | | | |
| Average Flow Rate | gpm | 125 | | | |
| *Bacteria* | | | | | |
| Fecal Coliform | MPN/100mL | See Note 8 | | | |
| *Conventionals* | | | | | |
| Hardness as CaCO3 | mg/L | 32 | | | |
| Nitrate as N | mg/L | 0.38 | | | |
| Oil and Grease | mg/L | 2 | | | |
| Total Dissolved Solids | mg/L | 76[9] | | | |
| Total Kjeldahl Nitrogen | mg/L | 0.22 | | | |

Table 3.10. Results for Chollas Creek TMDL Site 11-346, I-15S/Market-EFF[7]

| Constituent[1] | Units | Event 1/4/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|
| Total Phosphorus | mg/L | 0.63 | | | |
| Total Suspended Solids | mg/L | 235 | | | |
| Total Organic Carbon | mg/L | 5.5 | | | |
| Dissolved Organic Carbon | mg/L | 4.9 | | | |
| *Elements* | | | | | |
| Aluminum, total | µg/L | 57710 | | | |
| Chromium, total | µg/L | 8.9 | | 1605 | |
| Copper, total | µg/L | 17 | | 13 | |
| Iron, total | µg/L | 5900 | | | |
| Lead, total | µg/L | 11 | | 72 | |
| Zinc, total | µg/L | 110 | | 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 | | | |

Table 3.10. Results for Chollas Creek TMDL Site 11-346, I-15S/Market-EFF[7]

| Constituent[1] | Units | Event 1/4/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|
| 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 | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

PAHs = Polynuclear Aromatic Hydrocarbons

Table 3.10. Results for Chollas Creek TMDL Site 11-346, I-15S/Market-EFF[7]

| Constituent[1] | Units | Event 1/4/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|

°C = degrees Celsius

gpm = gallons per minute

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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.
3. Chollas Creek Dissolved Copper, Lead and Zinc TMDLs. The concentration-based waste load allocations for dissolved copper, lead and zinc are set as the acute and chronic limits in the CTR times 90 percent and based on statistical measures of hardness. The waste load allocations in this table are for the acute condition and calculated based on an assumed hardness of the receiving water of 90.8 mg/L. Only results greater than the acute values are highlighted.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide

Table 3.10. Results for Chollas Creek TMDL Site 11-346, I-15S/Market-EFF[7]

| Constituent[1] | Units | Event 1/4/2016 | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|

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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at the effluent of a Modular Infiltration Trench BMP.
8. The microbiology laboratory was unable to accept the sample. Therefore, the sample was not analyzed for bacteria.
9. Two TDS values are reported for this storm event. One TDS value is the laboratory value which is reported in the table. The other value is a field measurement value of 54 which is included in Appendix H.

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### 3.2.4 District 11 Rainbow Creek TMDL Monitoring Sites

Table 3.11 presents a summary of the storm event sampling conducted at the District 11 Rainbow Creek TMDL Monitoring Project site during the 2015–16 season. Additional site information is provided in Appendix F.

Table 3.11. District 11 Rainbow Creek TMDL Monitoring Site

| Site ID | Site Name | Event 1/5/2016 | Event 1/31/2016 | Event 3/5/2016 | Event 4/10/2016 | Event 5/6/2016 |
|---|---|---|---|---|---|---|
| 11-332 | CT I-15 Runoff | ✓ | ✓ | ✓ | ✓ | ✓ |

Table 3.12 presents the monitoring results for the District 11 Rainbow Creek TMDL Monitoring Project site.

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*to facilitate double-sided printing.*

Table 3.12. Results for Rainbow Creek TMDL Site 11-332, Caltrans I-15 Runoff[6]

| Constituent[1] | Units | Event 1/5/2016 | Event 1/31/2016 | Event 3/5/2016 | Event 4/10/2016 | Event 5/6/2016 | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | | |
| Total Phosphorus | mg/L | 0.13 | 0.16 | 0.13 | 0.15 | 0.32 | See Note 2,3 | | 0.1 |
| Total Nitrogen | mg/L | 1.69 | 3.16 | 2.05 | 3.62 | 3.43 | See Note 2,3 | | 1 |
| *Field Measurements* | | | | | | | | | |
| pH | pH units | 7.92 | 8.3 | 8.97 | 7.46 | 8.73 | | | 6.5 to 8.0 |
| Temperature | °C | 13.45 | 14.83 | 14.38 | 15.5 | 17.48 | | | |
| Turbidity | NTU | 301 | 243 | 171 | 28.4 | 980 | | | |
| Dissolved O2 | mg/L | 11.92 | 9.14 | 10.33 | 10.89 | 11.98 | | | |
| Specific Conductivity | µS/cm | 3 | 58 | 56 | 186.4 | ND | | | |
| Average Flow Rate | gpm | 135 | 55 | 196 | 90 | 79 | | | |
| *Bacteria* | | | | | | | | | |
| Fecal Coliform | MPN/100mL | 170 | 240 | 80 | 17000 | 900 | | | |
| *Conventionals* | | | | | | | | | |
| Alkalinity as CaCO3 | mg/L | 42 | 28 | 30 | 50 | 96 | | | |
| Hardness as CaCO3 | mg/L | 38 | 35 | 26 | 57 | 62 | | | |
| Nitrate as N | mg/L | 1.17 | 2.21 | 1.21 | 2.12 | 0.88 | | | 10 |
| Nitrite as N | mg/L | 0.02 | 0.18 | 0.14 | 0.15 | 0.22 | | | 1 |
| Oil and Grease | mg/L | 3 | 2 | 3 | 4 | 5 | | | |

Table 3.12. Results for Rainbow Creek TMDL Site 11-332, Caltrans I-15 Runoff[6]

| Constituent[1] | Units | Event 1/5/2016 | Event 1/31/2016 | Event 3/5/2016 | Event 4/10/2016 | Event 5/6/2016 | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 76 | 8 | 52 | 124 | 76 | | | |
| Total Kjeldahl Nitrogen | mg/L | 0.5 | 0.77 | 0.7 | 1.35 | 2.33 | | | |
| Total Suspended Solids | mg/L | 23 | 22 | 11 | 86 | 239 | | | |
| Total Organic Carbon | mg/L | 6 | 12.1 | 5.24 | 27.2 | 27.5 | | | |
| Dissolved Organic Carbon | mg/L | 4.9 | 4.7 | 4.4 | 22.8 | 24.5 | | | |
| Orthophosphate (dissolved) | mg/L | 0.05 | 0.12 | 0.04 | 0.04 | 0.07 | | | |
| Ammonia as N | mg/L | 0.22 | 0.29 | 0.12 | 0.26 | 0.39 | | | |
| *Elements* | | | | | | | | | |
| Aluminum, total | µg/L | 1262 | 1243 | 744 | 2100 | 5241 | | | |
| Chromium, total | µg/L | 3.1 | 3.2 | 11 | 4.3 | 7.3 | | 2367 | |
| Copper, total | µg/L | 17 | 22 | 14 | 25 | 47 | | 20 | |
| Iron, total | µg/L | 1200 | 1400 | 690 | 1600 | 3500 | | | |
| Lead, total | µg/L | 5.1 | 4.3 | 2.6 | 7.6 | 25 | | 132 | |
| Zinc, total | µg/L | 76 | 97 | 37 | 110 | 310 | | 165 | |
| *Toxicity* | | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | PASS | PASS | PASS | PASS | PASS | | | |
| Chronic Toxicity, Survival | P/F | PASS | PASS | PASS | PASS | PASS | | | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | | |

Table 3.12. Results for Rainbow Creek TMDL Site 11-332, Caltrans I-15 Runoff[6]

| Constituent[1] | Units | Event 1/5/2016 | Event 1/31/2016 | Event 3/5/2016 | Event 4/10/2016 | Event 5/6/2016 | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|
| 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 | | | 200 |
| 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 | | | |

Abbreviations & Acronyms:

Table 3.12. Results for Rainbow Creek TMDL Site 11-332, Caltrans I-15 Runoff[6]

| Constituent[1] | Units | Event 1/5/2016 | Event 1/31/2016 | Event 3/5/2016 | Event 4/10/2016 | Event 5/6/2016 | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|

ND = Non-detect

P/F = Pass/Fail

$^{o}$C = degrees Celsius

gpm = gallons per minute

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. Rainbow Creek Total Nitrogen and Total Phosphorus TMDL. The waste load allocations for nitrogen and Phosphorus are 49 kg/yr and 5 kg/yr, respectively.
3. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.

Table 3.12. Results for Rainbow Creek TMDL Site 11-332, Caltrans I-15 Runoff[6]

| | | | | | | | | Reference Values[5] | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Basin |
| | | Event | Event | Event | Event | Event | TMDL | CTR | Plan |
| Constituent[1] | Units | 1/5/2016 | 1/31/2016 | 3/5/2016 | 4/10/2016 | 5/6/2016 | Limits | Values[4] | Values |

5. See Appendix I for selection of Reference Values.

6. This monitoring site is located at a Caltrans discharge point.

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### 3.2.5 NPDES Permit TMDL Monitoring Sites

Tables 3.13 through 3.16 summarize the storm event sampling conducted at the NPDES TMDL Monitoring Project sites during the 2015–16 season. Additional site information is provided in Appendix F.

Table 3.13. NPDES Permit TMDL Monitoring Sites: Districts 3 and 10[1]

| Site ID | Site Name | Event 1/5/2016 | Event 2/17/2016 | Event 3/4/2016 | Event 3/10/2016 | Event 4/22/2016 |
|---|---|---|---|---|---|---|
| 3-397 | I-5 SB @ Consumnes | | ✓ | ✓ | ✓ | |
| 10-300 | 209-6T | ✓ | | | | ✓ |

Notes:

1. One station monitored last year, 3-217, was not monitored for the 2015–16 season. See Appendix A for details.

Table 3.14. NPDES Permit TMDL Monitoring Sites: District 4

| Site ID | Site Name | Event 11/1/2015 | Event 11/15/2015 | Event 12/3/2015 | Event 1/5/2016 | Event 2/17/2016 | Event 3/4/2016 |
|---|---|---|---|---|---|---|---|
| 4-324 | I-80/880/580 Interchange | | | | ✓ | | ✓ |
| 4-349 | Carquinez Bridge, South | ✓ | ✓ | ✓ | | ✓ | |
| 4-350 | I-680/24 Interchange | ✓ | ✓ | ✓ | | ✓ | |
| 4-351 | I-580/80 Interchange | ✓ | ✓ | ✓ | | ✓ | |

Table 3.15. NPDES Permit TMDL Monitoring Sites: District 7

| Site ID | Site Name | Event 1/5/2016 | Event 1/31/2016 | Event 3/6/2016 | Event 3/11/2016 |
|---|---|---|---|---|---|
| 7-09 | Hollywood CSF Outlet | ✓ | ✓ | | ✓ |
| 7-201 | UCLA-1 | ✓ | ✓ | ✓ | |
| 7-336 | SMB-MC | ✓ | ✓ | ✓ | |

Table 3.16. NPDES Permit TMDL Monitoring Sites: District 12

| Site ID | Site Name | Event 10/4/2015 | Event 1/4/2016 | Event 2/17/2016 | Event 3/6/2016 |
|---|---|---|---|---|---|
| 12-330 | 1149L Outlet | ✓ | ✓ | | ✓ |
| 12-336 | 1194 Outlet | ✓ | ✓ | | ✓ |
| 12-356 | 1180R | | ✓ | ✓ | ✓ |

Tables 3.17 through 3.28 present the monitoring results for the NPDES TMDL Monitoring sites.

Table 3.17. Results for NPDES Permit TMDL Site 3-397, I-5 Southbound at Consumnes[6]

| Constituent[1] | Units | Event 2/17/2016 3-Hour Composite | Event 3/4/2016 3-Hour Composite | Event 3/10/2016 3-Hour Manual | Event 3/10/2016 Full Storm | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | |
| Methyl Mercury | ng/L | 0.16 | 0.1 | 0.24 | 0.17 | See Notes 2,3 | | |
| *Field Measurements* | | | | | | | | |
| pH | pH units | 10.46[7] | 9.4 | 9.7 | | | | 6.5 to 8.5 |
| Temperature | °C | 11.7 | 17.04 | 15.87 | | | | |
| Average Flow Rate | gpm | 31 | 11 | 8.8 | | | | |
| *Conventionals* | | | | | | | | |
| Hardness as CaCO3 | mg/L | 190 | 170 | 140 | 220 | | | |
| Nitrate as N | mg/L | 1.2 | 1.4 | 1.1 | 1.5 | | | 45 |
| Oil & Grease | mg/L | 1.5 | 4 | 4.9 | 5.1 | | | |
| Total Dissolved Solids | mg/L | 190 | 78 | 120 | 120 | | | 250 |
| Total Kjeldahl Nitrogen | mg/L | 2.3 | 1.8 | 1.5 | 1.9 | | | |
| Total Phosphorus | mg/L | 0.8 | 0.78 | 0.81 | 1.6 | | | |
| Total Suspended Solids | mg/L | 1080 | 972 | 624 | 1460 | | | |
| *Bacteria* | | | | | | | | |
| Fecal Coliform[8] | MPN/100mL | 1600 | 1600 | 1600 | | | | |
| *Elements* | | | | | | | | |
| Aluminum, total | µg/L | 27000 | 27000 | 23000 | 38000 | | | |

Table 3.17. Results for NPDES Permit TMDL Site 3-397, I-5 Southbound at Consumnes[6]

| Constituent[1] | Units | Event 2/17/2016 3-Hour Composite | Event 3/4/2016 3-Hour Composite | Event 3/10/2016 3-Hour Manual | Event 3/10/2016 Full Storm | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Chromium, total | µg/L | 73 | 67 | 59 | 98 | | 1096 | |
| Copper, total | µg/L | 74 | 78 | 52 | 82 | | 8.2 | |
| Iron, total | µg/L | 36000 | 34000 | 30000 | 48000 | | | 300 |
| Lead, total | µg/L | 20 | 19 | 14 | 23 | | 40 | |
| Zinc, total | µg/L | 270 | 270 | 140 | 210 | | 74 | |
| *Toxicity* | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | FAIL | PASS | FAIL | FAIL | | | |
| 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 | | | |
| Benz(a)anthracene | ng/L | ND | ND | ND | ND | | | |
| Benzo(a)pyrene | ng/L | ND | ND | ND | ND | | | 200 |
| Benzo(b)fluoranthene | ng/L | ND | ND | ND | ND | | | |
| Benzo(e)pyrene | ng/L | ND | ND | ND | ND | | | |
| Benzo(g,h,i)perylene | ng/L | ND | 31.3 | ND | ND | | | |
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | ND | | | |

Table 3.17. Results for NPDES Permit TMDL Site 3-397, I-5 Southbound at Consumnes[6]

| Constituent[1] | Units | Event 2/17/2016 3-Hour Composite | Event 3/4/2016 3-Hour Composite | Event 3/10/2016 3-Hour Manual | Event 3/10/2016 Full Storm | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Biphenyl | ng/L | ND | ND | ND | ND | | | |
| Chrysene | ng/L | ND | ND | ND | ND | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND | | | |
| Dibenzothiophene | ng/L | ND | ND | ND | ND | | | |
| Dimethylnaphthalene, 2,6- | ng/L | ND | ND | ND | ND | | | |
| Fluoranthene | ng/L | 37.2 | 39.1 | ND | ND | | | |
| Fluorene | ng/L | ND | ND | ND | ND | | | |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND | ND | ND | | | |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND | ND | | | |
| Methylnaphthalene, 2- | ng/L | ND | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | ND | | | |
| Perylene | ng/L | ND | ND | ND | ND | | | |
| Phenanthrene | ng/L | ND | 26.9 | ND | ND | | | |
| Pyrene | ng/L | 57.5 | 72 | 34.6 | 57.5 | | | |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | | | |

Abbreviations & Acronyms:

ND = Non-detect

Table 3.17. Results for NPDES Permit TMDL Site 3-397, I-5 Southbound at Consumnes[6]

| Constituent[1] | Units | Event 2/17/2016 3-Hour Composite | Event 3/4/2016 3-Hour Composite | Event 3/10/2016 3-Hour Manual | Event 3/10/2016 Full Storm | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|

P/F = Pass/Fail

$^{o}$C = degrees Celsius

gpm = gallons per minute

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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.
3. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
5. See Appendix I for selection of Reference Values.

Table 3.17. Results for NPDES Permit TMDL Site 3-397, I-5 Southbound at Consumnes[6]

| | | Event | Event | Event | | | Reference Values[5] | |
|---|---|---|---|---|---|---|---|---|
| | | 2/17/2016 | 3/4/2016 | 3/10/2016 | | | | Basin |
| | | 3-Hour | 3-Hour | 3-Hour | Full | TMDL | CTR | Plan |
| Constituent[1] | Units | Composite | Composite | Manual | Storm | Limits | Values[4] | Values |

6. This monitoring site is located at a Caltrans discharge point.
7. Two pH values are reported for this storm event. One pH value is a field measurement which is reported in the table. The other value is a laboratory measurement of 9.4 which is included in Appendix H.
8. The values reported for the Feb. 17 and Mar. 10 events were reported by the laboratory as greater-than-or-equal to.

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Table 3.18. Results for NPDES Permit TMDL Site 10-300, 209-6T[6]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 4/22/2016 3-Hour Composite | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | |
| Methyl Mercury | ng/L | 0.11 | 0.09 | 0.16 | See Notes 2,3 | | |
| *Field Measurements* | | | | | | | |
| pH | pH units | 9.92 | | See Note 7 | | | 6.5 to 8.5 |
| Temperature | °C | 8.8 | | See Note 7 | | | |
| Average Flow Rate | gpm | 6.3 | | 2.8 | | | |
| *Conventionals* | | | | | | | |
| Hardness as CaCO3 | mg/L | 20 | 18 | 60 | | | |
| Nitrate as N | mg/L | 1.4 | 0.15 | 0.4 | | | 45 |
| Oil & Grease | mg/L | 1.9 | 2 | 1.6 | | | |
| Total Dissolved Solids | mg/L | 66 | 54 | 100 | | | |
| Total Kjeldahl Nitrogen | mg/L | 1.9 | 1.7 | 2.1 | | | |
| Total Phosphorus | mg/L | 0.13 | 0.15 | 0.87 | | | |
| Total Suspended Solids | mg/L | 28 | 47 | 596 | | | |
| *Bacteria* | | | | | | | |
| Fecal Coliform[8] | MPN/100mL | 540 | 110 | 1600 | | | |
| *Elements* | | | | | | | |
| Aluminum, total | µg/L | 910 | 1200 | 14000 | | | |

Table 3.18. Results for NPDES Permit TMDL Site 10-300, 209-6T[6]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 4/22/2016 3-Hour Composite | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| Chromium, total | µg/L | 3.8 | 4.7 | 37 | | 1737 | |
| Copper, total | µg/L | 10 | 11 | 37 | | 14 | |
| Iron, total | µg/L | 1900 | 2400 | 23000 | | | 300 |
| Lead, total | µg/L | 1.6 | 2 | 14 | | 82 | |
| Zinc, total | µg/L | 84 | 100 | 360 | | 120 | |
| *Toxicity* | | | | | | | |
| Chronic Toxicity, Biomass | P/F | FAIL | FAIL | FAIL | | | |
| 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 | ND | ND | | | |
| Benzo(a)pyrene | ng/L | ND | ND | ND | | | 200 |
| Benzo(b)fluoranthene | ng/L | ND | ND | ND | | | |
| Benzo(e)pyrene | ng/L | 45.2 | 34.8 | ND | | | |
| Benzo(g,h,i)perylene | ng/L | 47.2 | ND | ND | | | |
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | | | |

Table 3.18. Results for NPDES Permit TMDL Site 10-300, 209-6T[6]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 4/22/2016 3-Hour Composite | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| Biphenyl | ng/L | ND | ND | ND | | | |
| Chrysene | ng/L | ND | ND | ND | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | | | |
| Dibenzothiophene | ng/L | ND | ND | ND | | | |
| Dimethylnaphthalene, 2,6- | ng/L | ND | ND | ND | | | |
| Fluoranthene | ng/L | 47.5 | 39.8 | ND | | | |
| Fluorene | ng/L | ND | ND | ND | | | |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND | ND | | | |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND | | | |
| Methylnaphthalene, 2- | ng/L | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | | | |
| Perylene | ng/L | ND | ND | ND | | | |
| Phenanthrene | ng/L | ND | ND | ND | | | |
| Pyrene | ng/L | 98.2 | 85.2 | ND | | | |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | | | |

Abbreviations & Acronyms:

ND = Non-detect

Table 3.18. Results for NPDES Permit TMDL Site 10-300, 209-6T[6]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 4/22/2016 3-Hour Composite | TMDL Limits | Reference Values[5] CTR Values[4] | Reference Values[5] Basin Plan Values |
|---|---|---|---|---|---|---|---|

P/F = Pass/Fail

$^{o}$C = degrees Celsius

gpm = gallons per minute

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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.
3. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
5. See Appendix I for selection of Reference Values.

Table 3.18. Results for NPDES Permit TMDL Site 10-300, 209-6T[6]

| | | Event 1/5/2016 | | Event 4/22/2016 | | Reference Values[5] | |
|---|---|---|---|---|---|---|---|
| Constituent[1] | Units | 3-Hour Manual | Full Storm | 3-Hour Composite | TMDL Limits | CTR Values[4] | Basin Plan Values |

6. This monitoring site is located at a Caltrans discharge point.
7. Field crews did not take this field measurement.
8. The value reported for the Apr. 22 event was reported by the laboratory as greater-than-or-equal to.

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Table 3.19. Results for NPDES Permit TMDL Site 4-324, I-80/880/580 IC, Basin 5[7]

| Constituent[1] | Units | Event 1/5/2016 Full Storm | Event 1/5/2016 3-Hour Manual | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | |
| Mercury | µg/L | 0.018 | | 0.008 | See Notes 2,4 | | |
| Methyl Mercury | ng/L | 0.17 | | 0.06 | See Notes 2,4 | | |
| PCB 005/8 | ng/L | ND | | ND | See Notes 3,4 | | |
| PCB 018 | ng/L | 0.00544 | | 0.00357 | See Notes 3,4 | | |
| PCB 020/21/33 | ng/L | ND | | ND | See Notes 3,4 | | |
| PCB 028 | ng/L | 0.00561 | | 0.00449 | See Notes 3,4 | | |
| PCB 031 | ng/L | 0.00487 | | 0.00602 | See Notes 3,4 | | |
| PCB 043/49 | ng/L | 0.0118 | | 0.0127 | See Notes 3,4 | | |
| PCB 044 | ng/L | 0.019 | | 0.0177 | See Notes 3,4 | | |
| PCB 052/69 | ng/L | 0.0298 | | 0.0365 | See Notes 3,4 | | |
| PCB 056/60 | ng/L | ND | | 0.00449 | See Notes 3,4 | | |
| PCB 061/70 | ng/L | ND | | 0.0107 | See Notes 3,4 | | |
| PCB 066/76 | ng/L | ND | | 0.00718 | See Notes 3,4 | | |
| PCB 074 | ng/L | ND | | 0.00279 | See Notes 3,4 | | |
| PCB 087/117/125 | ng/L | 0.0113 | | 0.00957 | See Notes 3,4 | | |
| PCB 090/101 | ng/L | 0.038 | | 0.0291 | See Notes 3,4 | | |
| PCB 095/98/102 | ng/L | 0.0372 | | 0.0369 | See Notes 3,4 | | |

Table 3.19. Results for NPDES Permit TMDL Site 4-324, I-80/880/580 IC, Basin 5[7]

| Constituent[1] | Units | Event 1/5/2016 Full Storm | Event 1/5/2016 3-Hour Manual | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| PCB 097 | ng/L | 0.00989 | | 0.00561 | See Notes 3,4 | | |
| PCB 099 | ng/L | 0.0107 | | 0.0106 | See Notes 3,4 | | |
| PCB 105 | ng/L | 0.00622 | | 0.00575 | See Notes 3,4 | | |
| PCB 106/118 | ng/L | 0.0178 | | 0.0147 | See Notes 3,4 | | |
| PCB 110 | ng/L | 0.0327 | | 0.0293 | See Notes 3,4 | | |
| PCB 128/162 | ng/L | 0.00534 | | 0.00376 | See Notes 3,4 | | |
| PCB 132/161 | ng/L | 0.00793 | | 0.00779 | See Notes 3,4 | | |
| PCB 138/163/164 | ng/L | 0.0309 | | 0.0175 | See Notes 3,4 | | |
| PCB 139/149 | ng/L | 0.0263 | | 0.0186 | See Notes 3,4 | | |
| PCB 141 | ng/L | 0.00637 | | 0.00462 | See Notes 3,4 | | |
| PCB 151 | ng/L | 0.00556 | | ND | See Notes 3,4 | | |
| PCB 153 | ng/L | 0.0411 | | 0.0218 | See Notes 3,4 | | |
| PCB 156 | ng/L | 0.00319 | | 0.00238 | See Notes 3,4 | | |
| PCB 158/160 | ng/L | ND | | 0.00216 | See Notes 3,4 | | |
| PCB 170 | ng/L | 0.00723 | | 0.00444 | See Notes 3,4 | | |
| PCB 174 | ng/L | ND | | 0.0051 | See Notes 3,4 | | |
| PCB 177 | ng/L | ND | | 0.00575 | See Notes 3,4 | | |
| PCB 180 | ng/L | 0.0253 | | 0.014 | See Notes 3,4 | | |

Table 3.19. Results for NPDES Permit TMDL Site 4-324, I-80/880/580 IC, Basin 5[7]

| Constituent[1] | Units | Event 1/5/2016 Full Storm | Event 1/5/2016 3-Hour Manual | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| PCB 182/187 | ng/L | 0.0113 | | 0.00946 | See Notes 3,4 | | |
| PCB 183 | ng/L | 0.00388 | | ND | See Notes 3,4 | | |
| PCB 194 | ng/L | 0.00756 | | 0.00519 | See Notes 3,4 | | |
| PCB 195 | ng/L | ND | | ND | See Notes 3,4 | | |
| PCB 196/203 | ng/L | 0.00937 | | ND | See Notes 3,4 | | |
| PCB 201 | ng/L | ND | | ND | See Notes 3,4 | | |
| *Field Measurements* | | | | | | | |
| pH | pH units | 6.39 | | 6.78 | | | 6.5 to 8.5 |
| Temperature | °C | 12.3 | | 15.2 | | | |
| Average Flow Rate | gpm | 150 | | 79 | | | |
| *Bacteria* | | | | | | | |
| Fecal Coliform | MPN/100mL | ND | | See Note 8 | | | |
| Enterococcus | MPN/100mL | ND | | See Note 8 | | | 151 |
| *Conventionals* | | | | | | | |
| Hardness as CaCO3 | mg/L | 770 | 830 | 1200 | | | |
| Nitrate as N | mg/L | 2.6 | 0.92 | 1.4 | | | |
| Oil & Grease | mg/L | ND | | 2.4 | | | |
| Total Dissolved Solids | mg/L | 2900 | 2800 | 3200 | | | |

Table 3.19. Results for NPDES Permit TMDL Site 4-324, I-80/880/580 IC, Basin 5[7]

| Constituent[1] | Units | Event 1/5/2016 Full Storm | Event 1/5/2016 3-Hour Manual | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| Total Kjeldahl Nitrogen | mg/L | 3.6 | 3.4 | 3.6 | | | |
| Total Phosphorus | mg/L | 0.5 | 0.59 | 0.52 | | | |
| Total Suspended Solids | mg/L | ND | ND | 4 | | | |
| SSC | mg/L | 4.1 | | ND | | | |
| *Elements* | | | | | | | |
| Aluminum, total | µg/L | 130 | 140 | 110 | | | |
| Chromium, total | µg/L | 1.5 | 1.9 | 1.6 | | 5405 | 5405 |
| Copper, total | µg/L | 23 | 32 | 20 | | 5.78 | 5.78 |
| Iron, total | µg/L | 560 | 470 | 550 | | | |
| Lead, total | µg/L | 0.77 | 0.93 | 0.38 | | 221 | 221 |
| Zinc, total | µg/L | 42 | 41 | 41 | | 95 | 95 |
| *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 | | | |

Table 3.19. Results for NPDES Permit TMDL Site 4-324, I-80/880/580 IC, Basin 5[7]

| Constituent[1] | Units | Event 1/5/2016 Full Storm | Event 1/5/2016 3-Hour Manual | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| 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(e)pyrene | ng/L | ND | ND | ND | | | |
| Benzo(g,h,i)perylene | ng/L | ND | ND | ND | | | |
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | | | |
| Biphenyl | ng/L | ND | ND | ND | | | |
| Chrysene | ng/L | ND | ND | ND | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | | | |
| Dibenzothiophene | ng/L | ND | ND | ND | | | |
| Dimethylnaphthalene, 2,6- | 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 | | | |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND | | | |
| Methylnaphthalene, 2- | ng/L | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | | | |

Table 3.19. Results for NPDES Permit TMDL Site 4-324, I-80/880/580 IC, Basin 5[7]

| Constituent[1] | Units | Event 1/5/2016 Full Storm | Event 1/5/2016 3-Hour Manual | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|
| Perylene | ng/L | ND | ND | ND | | | |
| Phenanthrene | ng/L | ND | ND | ND | | | |
| Pyrene | ng/L | ND | ND | ND | | | |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

SSC = Suspended Solids Concentration

$^{o}$C = degrees Celsius

gpm = gallons per minute

kg/yr = kilograms per year

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the

Table 3.19. Results for NPDES Permit TMDL Site 4-324, I-80/880/580 IC, Basin 5[7]

| | | Event 1/5/2016 | | Event 3/5/2016 | | Reference Values[6] | |
|---|---|---|---|---|---|---|---|
| Constituent[1] | Units | Full Storm | 3-Hour Manual | 3-Hour Composite | TMDL Limits | CTR Values[5] | Basin Plan Values |

original value and any field duplicate value are provided in Appendix H.

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 PCBs TMDL. All storm water runoff sources share a 2 kg/yr waste load allocation.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at the effluent of a Bioretention BMP.
8. Field crews were unable to collect these samples.

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*to facilitate double-sided printing.*

Table 3.20. Results for NPDES Permit TMDL Site 4-349, Carquinez Bridge, South[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | | | |
| Mercury | µg/L | 0.015 | 0.0048 | | 0.044 | 0.0058 | | See Notes 2,4 | | |
| Methyl Mercury | ng/L | 0.2 | 0.13 | | 0.22 | 0.11 | | See Notes 2,4 | | |
| PCB 005/8 | ng/L | 0.103 | 0.0281 | | 1.72 | 0.0622 | | See Notes 3,4 | | |
| PCB 018 | ng/L | 0.211 | 0.0499 | | 3.64 | 0.0992 | | See Notes 3,4 | | |
| PCB 020/21/33 | ng/L | 0.211 | 0.0553 | | 2.43 | 0.0784 | | See Notes 3,4 | | |
| PCB 028 | ng/L | 0.264 | 0.0644 | | 3.14 | 0.115 | | See Notes 3,4 | | |
| PCB 031 | ng/L | 0.242 | 0.0629 | | 3.1 | 0.102 | | See Notes 3,4 | | |
| PCB 043/49 | ng/L | 0.196 | 0.0491 | | 2.04 | 0.06 | | See Notes 3,4 | | |
| PCB 044 | ng/L | 0.257 | 0.0768 | | 3.06 | 0.107 | | See Notes 3,4 | | |
| PCB 052/69 | ng/L | 0.259 | 0.0764 | | 2.64 | 0.0838 | | See Notes 3,4 | | |
| PCB 056/60 | ng/L | 0.135 | 0.0456 | | 0.912 | 0.0469 | | See Notes 3,4 | | |
| PCB 061/70 | ng/L | 0.267 | 0.0858 | | 1.83 | 0.0888 | | See Notes 3,4 | | |
| PCB 066/76 | ng/L | 0.185 | 0.0547 | | 1.24 | 0.054 | | See Notes 3,4 | | |
| PCB 074 | ng/L | 0.0974 | 0.03 | | 0.757 | 0.0319 | | See Notes 3,4 | | |
| PCB 087/117/125 | ng/L | 0.152 | 0.053 | | 0.684 | 0.0441 | | See Notes 3,4 | | |
| PCB 090/101 | ng/L | 0.399 | 0.125 | | 1.69 | 0.105 | | See Notes 3,4 | | |
| PCB 095/98/102 | ng/L | 0.261 | 0.0849 | | 1.43 | 0.0799 | | See Notes 3,4 | | |

Table 3.20. Results for NPDES Permit TMDL Site 4-349, Carquinez Bridge, South[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| PCB 097 | ng/L | 0.123 | 0.0424 | | 0.517 | 0.0352 | | See Notes 3,4 | | |
| PCB 099 | ng/L | 0.173 | 0.0487 | | 0.66 | 0.0387 | | See Notes 3,4 | | |
| PCB 105 | ng/L | 0.142 | 0.0475 | | 0.557 | 0.0434 | | See Notes 3,4 | | |
| PCB 106/118 | ng/L | 0.389 | 0.119 | | 1.46 | 0.103 | | See Notes 3,4 | | |
| PCB 110 | ng/L | 0.423 | 0.144 | | 1.92 | 0.135 | | See Notes 3,4 | | |
| PCB 128/162 | ng/L | 0.0813 | 0.0297 | | 0.281 | 0.0258 | | See Notes 3,4 | | |
| PCB 132/161 | ng/L | 0.127 | 0.0435 | | 0.517 | 0.0347 | | See Notes 3,4 | | |
| PCB 138/163/164 | ng/L | 0.463 | 0.155 | | 1.7 | 0.122 | | See Notes 3,4 | | |
| PCB 139/149 | ng/L | 0.319 | 0.102 | | 1.47 | 0.0819 | | See Notes 3,4 | | |
| PCB 141 | ng/L | 0.0831 | 0.0288 | | 0.334 | 0.0242 | | See Notes 3,4 | | |
| PCB 151 | ng/L | 0.0727 | ND | | 0.379 | 0.0155 | | See Notes 3,4 | | |
| PCB 153 | ng/L | 0.378 | 0.118 | | 1.38 | 0.1 | | See Notes 3,4 | | |
| PCB 156 | ng/L | 0.0493 | 0.0142 | | 0.172 | 0.0115 | | See Notes 3,4 | | |
| PCB 158/160 | ng/L | 0.0559 | 0.0191 | | 0.212 | 0.0134 | | See Notes 3,4 | | |
| PCB 170 | ng/L | 0.109 | 0.036 | | 0.384 | 0.0273 | | See Notes 3,4 | | |
| PCB 174 | ng/L | 0.119 | 0.0381 | | 0.488 | 0.0332 | | See Notes 3,4 | | |
| PCB 177 | ng/L | 0.067 | 0.026 | | 0.247 | 0.0182 | | See Notes 3,4 | | |
| PCB 180 | ng/L | 0.263 | 0.0915 | | 0.979 | 0.0609 | | See Notes 3,4 | | |

Table 3.20. Results for NPDES Permit TMDL Site 4-349, Carquinez Bridge, South[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| PCB 182/187 | ng/L | 0.137 | 0.0491 | | 0.503 | 0.0362 | | See Notes 3,4 | | |
| PCB 183 | ng/L | 0.0593 | 0.0184 | | 0.225 | 0.0152 | | See Notes 3,4 | | |
| PCB 194 | ng/L | 0.0562 | 0.0205 | | 0.226 | 0.0209 | | See Notes 3,4 | | |
| PCB 195 | ng/L | 0.025 | 0.0106 | | 0.108 | 0.00804 | | See Notes 3,4 | | |
| PCB 196/203 | ng/L | 0.0888 | 0.0362 | | 0.261 | ND | | See Notes 3,4 | | |
| PCB 201 | ng/L | 0.0158 | 0.00652 | | 0.0416 | 0.00655 | | See Notes 3,4 | | |
| *Field Measurements* | | | | | | | | | | |
| pH | pH units | 7.65 | 8.02 | | 8.32 | 8.62 | | | | 6.5 to 8.5 |
| Temperature | °C | 16.4 | 12.8 | | 12.9 | 16.4 | | | | |
| Average Flow Rate | gpm | 1.9 | 5.3 | | 3.8 | 4.1 | | | | |
| *Bacteria* | | | | | | | | | | |
| Fecal Coliform[9] | MPN/100mL | 1600 | 1600 | | 920 | See Note 8 | | | | |
| Enterococcus[10] | MPN/100mL | 2419.6 | 2419.6 | | 2419.6 | See Note 8 | | | | 151 |
| *Conventionals* | | | | | | | | | | |
| Hardness as CaCO3 | mg/L | 62 | 36 | 36 | 60 | 28 | 28 | | | |
| Nitrate as N | mg/L | 1.4 | 0.63 | 0.53 | 1.4 | 0.2 | 0.51 | | | |
| Oil & Grease | mg/L | 7.6 | 3.9 | | 11 | 3 | | | | |
| Total Dissolved Solids | mg/L | 96 | 38 | 50 | 140 | 22 | 28 | | | |

Table 3.20. Results for NPDES Permit TMDL Site 4-349, Carquinez Bridge, South[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Kjeldahl Nitrogen | mg/L | 2.6 | 1 | 1.1 | 2.1 | 1.2 | 1.2 | | | |
| Total Phosphorus | mg/L | 0.36 | 0.15 | 0.16 | 0.32 | 0.11 | 0.11 | | | |
| Total Suspended Solids | mg/L | 38 | 45 | 42 | 126 | 51 | 35 | | | |
| SSC | mg/L | 46 | 30 | | 93 | 6.7 | | | | |
| *Elements* | | | | | | | | | | |
| Aluminum, total | µg/L | 1200 | 800 | 810 | 2700 | 1200 | 900 | | | |
| Chromium, total | µg/L | 12 | 5.1 | 5.8 | 21 | 7.3 | 6.5 | | 2153 | 2153 |
| Copper, total | µg/L | 71 | 33 | 33 | 82 | 30 | 29 | | 5.8 | 5.8 |
| Iron, total | µg/L | 3300 | 1800 | 1900 | 6500 | 2500 | 2000 | | | |
| Lead, total | µg/L | 8.3 | 5.9 | 8.1 | 21 | 8.9 | 7.6 | | 114 | 114 |
| Zinc, total | µg/L | 320 | 180 | 180 | 400 | 170 | 160 | | 95 | 95 |
| *Toxicity* | | | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | FAIL | PASS | PASS | FAIL | PASS | PASS | | | |
| Chronic Toxicity, Survival | P/F | PASS | PASS | PASS | PASS | PASS | PASS | | | |
| *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 | | | |

Table 3.20. Results for NPDES Permit TMDL Site 4-349, Carquinez Bridge, South[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| Benz(a)anthracene | ng/L | ND | 59.7 | 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 | 75.3 | ND | | | |
| Benzo(g,h,i)perylene | ng/L | ND | ND | ND | ND | 101 | 68 | | | |
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | ND | ND | ND | | | |
| Biphenyl | ng/L | ND | ND | ND | ND | ND | ND | | | |
| Chrysene | ng/L | ND | 39 | ND | ND | 125 | 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 | 87.8 | 57.7 | 49.8 | 182 | 141 | 89.9 | | | |
| 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 | ND | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | ND | ND | ND | | | |

Table 3.20. Results for NPDES Permit TMDL Site 4-349, Carquinez Bridge, South[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| Perylene | ng/L | ND | ND | ND | ND | ND | ND | | | |
| Phenanthrene | ng/L | 47.1 | 31.8 | ND | 107 | 99.4 | ND | | | |
| Pyrene | ng/L | 124 | 77.7 | 68.9 | 286 | 183 | 117 | | | |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | ND | ND | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

SSC = Suspended Solids Concentration

$^{o}$C = degrees Celsius

gpm = gallons per minute

kg/yr = kilograms per year

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the

Table 3.20. Results for NPDES Permit TMDL Site 4-349, Carquinez Bridge, South[7]

| | | Event | Event | | Event | Event | | | | Reference Values[6] |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 11/1/2015 | 11/15/2015 | | 12/3/2015 | 2/17/2016 | | | | Basin |
| | | 3-Hour | Full | 3-Hour | 3-Hour | Full | 3-Hour | TMDL | CTR | Plan |
| Constituent[1] | Units | Composite | Storm | Manual | Composite | Storm | Manual | Limits | Values[5] | Values |

original value and any field duplicate value are provided in Appendix H.

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 PCBs TMDL. All storm water runoff sources share a 2 kg/yr waste load allocation.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at a Caltrans discharge point.
8. Field crews were unable to collect these samples.
9. The values reported for the Nov. 1 and Nov. 15 events were reported by the laboratory as greater-than-or-equal to.
10. The values reported for the Nov. 1, Nov. 15, and Feb. 17 events were reported by the laboratory as greater-than-or-equal to.

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Table 3.21. Results for NPDES Permit TMDL Site 4-350, I-680/24 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | | | |
| Mercury | µg/L | 0.01 | 0.0088 | | 0.03 | 0.0055 | | See Notes 2,4 | | |
| Methyl Mercury | ng/L | 0.31 | 0.14 | | 0.4 | 0.15 | | See Notes 2,4 | | |
| Diazinon | ng/L | ND | ND | ND | ND | ND | ND | 0.1 | | 0.1 |
| PCB 005/8 | ng/L | ND | 0.0241 | | 0.0821 | ND | | See Notes 3,4 | | |
| PCB 018 | ng/L | 0.0225 | 0.054 | | 0.162 | 0.0194 | | See Notes 3,4 | | |
| PCB 020/21/33 | ng/L | 0.0285 | 0.0536 | | 0.155 | 0.0185 | | See Notes 3,4 | | |
| PCB 028 | ng/L | 0.0323 | 0.0719 | | 0.192 | 0.0185 | | See Notes 3,4 | | |
| PCB 031 | ng/L | 0.0304 | 0.0554 | | 0.175 | 0.0205 | | See Notes 3,4 | | |
| PCB 043/49 | ng/L | 0.0319 | 0.0806 | | 0.153 | 0.0188 | | See Notes 3,4 | | |
| PCB 044 | ng/L | 0.053 | 0.128 | | 0.248 | 0.0238 | | See Notes 3,4 | | |
| PCB 052/69 | ng/L | 0.0564 | 0.149 | | 0.273 | 0.0295 | | See Notes 3,4 | | |
| PCB 056/60 | ng/L | 0.034 | 0.0748 | | 0.141 | 0.0172 | | See Notes 3,4 | | |
| PCB 061/70 | ng/L | 0.0778 | 0.2 | | 0.324 | 0.0427 | | See Notes 3,4 | | |
| PCB 066/76 | ng/L | 0.0477 | 0.0977 | | 0.195 | 0.0214 | | See Notes 3,4 | | |
| PCB 074 | ng/L | 0.0201 | 0.0569 | | 0.105 | 0.0118 | | See Notes 3,4 | | |
| PCB 087/117/125 | ng/L | 0.0629 | 0.153 | | 0.235 | 0.0439 | | See Notes 3,4 | | |
| PCB 090/101 | ng/L | 0.152 | 0.377 | | 0.581 | 0.113 | | See Notes 3,4 | | |

Table 3.21. Results for NPDES Permit TMDL Site 4-350, I-680/24 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| PCB 095/98/102 | ng/L | 0.085 | 0.24 | | 0.351 | 0.0635 | | See Notes 3,4 | | |
| PCB 097 | ng/L | 0.0461 | 0.112 | | 0.157 | 0.0361 | | See Notes 3,4 | | |
| PCB 099 | ng/L | 0.0559 | 0.142 | | 0.201 | 0.0378 | | See Notes 3,4 | | |
| PCB 105 | ng/L | 0.0467 | 0.111 | | 0.179 | 0.047 | | See Notes 3,4 | | |
| PCB 106/118 | ng/L | 0.127 | 0.314 | | 0.497 | 0.121 | | See Notes 3,4 | | |
| PCB 110 | ng/L | 0.19 | 0.407 | | 0.656 | 0.133 | | See Notes 3,4 | | |
| PCB 128/162 | ng/L | 0.0287 | 0.0621 | | 0.109 | 0.0299 | | See Notes 3,4 | | |
| PCB 132/161 | ng/L | 0.0515 | 0.112 | | 0.193 | 0.0511 | | See Notes 3,4 | | |
| PCB 138/163/164 | ng/L | 0.154 | 0.367 | | 0.667 | 0.175 | | See Notes 3,4 | | |
| PCB 139/149 | ng/L | 0.123 | 0.261 | | 0.577 | 0.104 | | See Notes 3,4 | | |
| PCB 141 | ng/L | 0.0327 | 0.0784 | | 0.133 | 0.0304 | | See Notes 3,4 | | |
| PCB 151 | ng/L | 0.034 | 0.0711 | | 0.163 | 0.0248 | | See Notes 3,4 | | |
| PCB 153 | ng/L | 0.127 | 0.322 | | 0.557 | 0.135 | | See Notes 3,4 | | |
| PCB 156 | ng/L | 0.0109 | 0.0363 | | 0.0637 | 0.0186 | | See Notes 3,4 | | |
| PCB 158/160 | ng/L | 0.0193 | 0.0448 | | 0.0835 | 0.0209 | | See Notes 3,4 | | |
| PCB 170 | ng/L | 0.0235 | 0.0772 | | 0.148 | 0.0362 | | See Notes 3,4 | | |
| PCB 174 | ng/L | 0.0323 | 0.0888 | | 0.18 | 0.0387 | | See Notes 3,4 | | |
| PCB 177 | ng/L | ND | 0.0488 | | 0.0976 | 0.0232 | | See Notes 3,4 | | |

Table 3.21. Results for NPDES Permit TMDL Site 4-350, I-680/24 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| PCB 180 | ng/L | 0.0651 | 0.195 | | 0.394 | 0.0897 | | See Notes 3,4 | | |
| PCB 182/187 | ng/L | 0.0542 | 0.132 | | 0.23 | 0.043 | | See Notes 3,4 | | |
| PCB 183 | ng/L | ND | 0.0486 | | 0.1 | 0.0201 | | See Notes 3,4 | | |
| PCB 194 | ng/L | 0.0142 | 0.0448 | | 0.0985 | 0.0221 | | See Notes 3,4 | | |
| PCB 195 | ng/L | ND | 0.0157 | | 0.0439 | ND | | See Notes 3,4 | | |
| PCB 196/203 | ng/L | 0.0167 | 0.0622 | | 0.104 | 0.0267 | | See Notes 3,4 | | |
| PCB 201 | ng/L | ND | ND | | 0.0218 | ND | | See Notes 3,4 | | |
| *Field Measurements* | | | | | | | | | | |
| pH | pH units | 7.17 | 7.62 | | 7.8 | 8.2 | | | | 6.5 to 8.5 |
| Temperature | °C | 17 | 11.8 | | 13 | 13.2 | | | | |
| Average Flow Rate | gpm | 17.6 | 12.8 | | 13.5 | 12.7 | | | | |
| *Bacteria* | | | | | | | | | | |
| Fecal Coliform[8] | MPN/100mL | 920 | 1600 | | 350 | 280 | | | | |
| *Conventionals* | | | | | | | | | | |
| Hardness as CaCO3 | mg/L | 66 | 54 | 36 | 38 | 22 | 20 | | | |
| Nitrate as N | mg/L | 1.3 | 3.7 | 0.93 | 0.72 | 0.19 | 0.26 | | | |
| Oil & Grease | mg/L | 5.5 | 12 | | 11 | 2.6 | | | | |
| Total Dissolved Solids | mg/L | 140 | 96 | 52 | 86 | 18 | 14 | | | |

Table 3.21. Results for NPDES Permit TMDL Site 4-350, I-680/24 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Kjeldahl Nitrogen | mg/L | 3.3 | 2.2 | 1.5 | 1.9 | 1.9 | 1.2 | | | |
| Total Phosphorus | mg/L | 0.22 | 0.17 | 0.13 | 0.17 | 0.082 | 0.086 | | | |
| Total Suspended Solids | mg/L | 43 | 95 | 24 | 46 | 19 | 22 | | | |
| SSC | mg/L | 13 | 51 | | 106 | 13 | | | | |
| *Elements* | | | | | | | | | | |
| Aluminum, total | µg/L | 640 | 1500 | 680 | 1100 | 700 | 550 | | | |
| Chromium, total | µg/L | 7.1 | 7.5 | 4.1 | 6.3 | 3.8 | 3.5 | | 1737 | 1741 |
| Copper, total | µg/L | 73 | 62 | 41 | 68 | 29 | 29 | | 14 | 14 |
| Iron, total | µg/L | 1400 | 2900 | 1300 | 2400 | 1300 | 980 | | | |
| Lead, total | µg/L | 4.1 | 9 | 4.2 | 7.4 | 3.2 | 2.6 | | 82 | 82 |
| Zinc, total | µg/L | 500 | 580 | 330 | 340 | 130 | 120 | | 120 | 123 |
| *Toxicity* | | | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | FAIL | FAIL | PASS | FAIL | PASS | FAIL | | | |
| Chronic Toxicity, Survival | P/F | FAIL | PASS | PASS | FAIL | PASS | PASS | | | |
| *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 | | | |

Table 3.21. Results for NPDES Permit TMDL Site 4-350, I-680/24 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 51.2 | ND | ND | | | |
| Benzo(g,h,i)perylene | ng/L | ND | 81 | ND | 79.7 | 71.1 | 94.9 | | | |
| 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 | 121 | 60.2 | 88 | 52.6 | 86.2 | | | |
| 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 | ND | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | ND | ND | ND | | | |

Table 3.21. Results for NPDES Permit TMDL Site 4-350, I-680/24 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 Full Storm | Event 11/15/2015 3-Hour Manual | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 Full Storm | Event 2/17/2016 3-Hour Manual | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| Perylene | ng/L | ND | ND | ND | ND | ND | ND | | | |
| Phenanthrene | ng/L | 131 | 113 | 64.8 | 63.9 | ND | ND | | | |
| Pyrene | ng/L | 103 | 258 | 120 | 189 | 107 | 140 | | | |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | ND | ND | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

SSC = Suspended Solids Concentration

$^{o}$C = degrees Celsius

gpm = gallons per minute

kg/yr = kilograms per year

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the

Table 3.21. Results for NPDES Permit TMDL Site 4-350, I-680/24 Interchange[7]

| | | Event | Event | | Event | Event | | | Reference Values[6] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 11/1/2015 | 11/15/2015 | | 12/3/2015 | 2/17/2016 | | | | Basin |
| | | 3-Hour | Full | 3-Hour | 3-Hour | Full | 3-Hour | TMDL | CTR | Plan |
| Constituent[1] | Units | Composite | Storm | Manual | Composite | Storm | Manual | Limits | Values[5] | Values |

original value and any field duplicate value are provided in Appendix H.

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 PCBs TMDL. All storm water runoff sources share a 2 kg/yr waste load allocation.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at a Caltrans discharge point.
8. The value reported for the Nov. 15 event was reported by the laboratory as greater-than-or-equal to.

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*to facilitate double-sided printing.*

Table 3.22. Results for NPDES Permit TMDL Site 4-351, I-580/80 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 3-Hour Manual | Event 11/15/2015 Full Storm | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 3-Hour Manual | Event 2/17/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | | | |
| Mercury | µg/L | 0.015 | 0.0057 | | 0.019 | 0.0098 | | See Notes 2,4 | | |
| Methyl Mercury | ng/L | 0.23 | 0.15 | | 0.26 | 0.26 | | See Notes 2,4 | | |
| PCB 005/8 | ng/L | ND | ND | | 0.0568 | 0.0252 | | See Notes 3,4 | | |
| PCB 018 | ng/L | 0.00788 | 0.0155 | | 0.192 | 0.0657 | | See Notes 3,4 | | |
| PCB 020/21/33 | ng/L | ND | 0.0207 | | 0.165 | 0.0559 | | See Notes 3,4 | | |
| PCB 028 | ng/L | 0.0177 | 0.028 | | 0.287 | 0.0583 | | See Notes 3,4 | | |
| PCB 031 | ng/L | 0.012 | 0.0242 | | 0.254 | 0.0611 | | See Notes 3,4 | | |
| PCB 043/49 | ng/L | 0.0164 | 0.0268 | | 0.265 | 0.0438 | | See Notes 3,4 | | |
| PCB 044 | ng/L | 0.0316 | 0.0387 | | 0.348 | 0.0626 | | See Notes 3,4 | | |
| PCB 052/69 | ng/L | 0.0318 | 0.0497 | | 0.349 | 0.0666 | | See Notes 3,4 | | |
| PCB 056/60 | ng/L | 0.0198 | 0.0256 | | 0.154 | 0.0394 | | See Notes 3,4 | | |
| PCB 061/70 | ng/L | 0.0298 | 0.0558 | | 0.307 | 0.0755 | | See Notes 3,4 | | |
| PCB 066/76 | ng/L | 0.024 | 0.0353 | | 0.216 | 0.0482 | | See Notes 3,4 | | |
| PCB 074 | ng/L | 0.0133 | 0.0174 | | 0.121 | 0.0267 | | See Notes 3,4 | | |
| PCB 087/117/125 | ng/L | 0.0296 | 0.0409 | | 0.167 | 0.0573 | | See Notes 3,4 | | |
| PCB 090/101 | ng/L | 0.0785 | 0.102 | | 0.395 | 0.149 | | See Notes 3,4 | | |
| PCB 095/98/102 | ng/L | 0.0573 | 0.0666 | | 0.303 | 0.104 | | See Notes 3,4 | | |

Table 3.22. Results for NPDES Permit TMDL Site 4-351, I-580/80 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 3-Hour Manual | Event 11/15/2015 Full Storm | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 3-Hour Manual | Event 2/17/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| PCB 097 | ng/L | 0.0252 | 0.0306 | | 0.123 | 0.0483 | | See Notes 3,4 | | |
| PCB 099 | ng/L | 0.0337 | 0.0384 | | 0.158 | 0.0553 | | See Notes 3,4 | | |
| PCB 105 | ng/L | 0.0269 | 0.0288 | | 0.128 | 0.0482 | | See Notes 3,4 | | |
| PCB 106/118 | ng/L | 0.0701 | 0.0834 | | 0.353 | 0.133 | | See Notes 3,4 | | |
| PCB 110 | ng/L | 0.0995 | 0.109 | | 0.465 | 0.181 | | See Notes 3,4 | | |
| PCB 128/162 | ng/L | 0.017 | 0.0175 | | 0.0668 | 0.0285 | | See Notes 3,4 | | |
| PCB 132/161 | ng/L | 0.025 | 0.0297 | | 0.117 | 0.0456 | | See Notes 3,4 | | |
| PCB 138/163/164 | ng/L | 0.103 | 0.104 | | 0.396 | 0.162 | | See Notes 3,4 | | |
| PCB 139/149 | ng/L | 0.0824 | 0.0827 | | 0.332 | 0.116 | | See Notes 3,4 | | |
| PCB 141 | ng/L | 0.0199 | 0.0204 | | 0.0736 | 0.0285 | | See Notes 3,4 | | |
| PCB 151 | ng/L | 0.0211 | 0.0218 | | 0.0785 | 0.0284 | | See Notes 3,4 | | |
| PCB 153 | ng/L | 0.0854 | 0.0865 | | 0.325 | 0.126 | | See Notes 3,4 | | |
| PCB 156 | ng/L | 0.00943 | 0.00757 | | 0.0433 | 0.0143 | | See Notes 3,4 | | |
| PCB 158/160 | ng/L | 0.013 | ND | | 0.0483 | 0.0192 | | See Notes 3,4 | | |
| PCB 170 | ng/L | 0.0169 | 0.0169 | | 0.0855 | 0.0278 | | See Notes 3,4 | | |
| PCB 174 | ng/L | 0.0221 | 0.022 | | 0.0861 | 0.0351 | | See Notes 3,4 | | |
| PCB 177 | ng/L | 0.0134 | 0.0151 | | 0.0533 | 0.0205 | | See Notes 3,4 | | |
| PCB 180 | ng/L | 0.0494 | 0.0471 | | 0.186 | 0.081 | | See Notes 3,4 | | |

Table 3.22. Results for NPDES Permit TMDL Site 4-351, I-580/80 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 3-Hour Manual | Event 11/15/2015 Full Storm | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 3-Hour Manual | Event 2/17/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| PCB 182/187 | ng/L | 0.0316 | 0.0313 | | 0.108 | 0.046 | | See Notes 3,4 | | |
| PCB 183 | ng/L | 0.0125 | 0.0113 | | 0.0464 | 0.0177 | | See Notes 3,4 | | |
| PCB 194 | ng/L | 0.00988 | 0.00787 | | 0.0468 | 0.0211 | | See Notes 3,4 | | |
| PCB 195 | ng/L | ND | ND | | 0.0216 | ND | | See Notes 3,4 | | |
| PCB 196/203 | ng/L | 0.0158 | 0.0126 | | 0.0561 | 0.0313 | | See Notes 3,4 | | |
| PCB 201 | ng/L | 0.00303 | ND | | 0.0078 | ND | | See Notes 3,4 | | |
| *Field Measurements* | | | | | | | | | | |
| pH | pH units | 7.03 | 7.51 | | 7.49 | 8.13 | | | | 6.5 to 8.5 |
| Temperature | °C | 15.1 | 13.1 | | 12.4 | 14 | | | | |
| Average Flow Rate | gpm | 1.1 | 0.5 | | 0.5 | 0.8 | | | | |
| *Bacteria* | | | | | | | | | | |
| Fecal Coliform[9] | MPN/100mL | 1600 | 1600 | | 350 | 1600 | | | | |
| Enterococcus[10] | MPN/100mL | 2419.6 | 2419.6 | | 2419.6 | 2419.6 | | | | |
| *Conventionals* | | | | | | | | | | |
| Hardness as CaCO3 | mg/L | 42 | 46 | 36 | 64 | 56 | 34 | | | |
| Nitrate as N | mg/L | 0.56 | 0.84 | 0.7 | 1.1 | 1.8 | 0.4 | | | |
| Oil & Grease | mg/L | 4.4 | 4.1 | | 4.5 | 2.2 | | | | |
| Total Dissolved Solids | mg/L | 86 | 80 | 54 | 160 | 94 | 62 | | | |

Table 3.22. Results for NPDES Permit TMDL Site 4-351, I-580/80 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 3-Hour Manual | Event 11/15/2015 Full Storm | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 3-Hour Manual | Event 2/17/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| Total Kjeldahl Nitrogen | mg/L | 2.1 | 1.3 | 1.3 | 2.2 | 2.3 | 1.3 | | | |
| Total Phosphorus | mg/L | 0.29 | 0.27 | 0.26 | 0.35 | 0.26 | 0.14 | | | |
| Total Suspended Solids | mg/L | 20 | 2 | ND | 32 | 18 | 35 | | | |
| SSC | mg/L | 6.7 | 3.2 | | 20 | 14 | | | | |
| *Elements* | | | | | | | | | | |
| Aluminum, total | µg/L | 570 | 120 | 110 | 820 | 520 | 890 | | | |
| Chromium, total | µg/L | 4.1 | 2.2 | 2 | 5.6 | 4 | 4.3 | | 5405 | 5405 |
| Copper, total | µg/L | 45 | 20 | 20 | 35 | 34 | 31 | | 5.78 | 5.78 |
| Iron, total | µg/L | 1300 | 300 | 300 | 1600 | 1100 | 1800 | | | |
| Lead, total | µg/L | 3.7 | 1 | 1 | 5.8 | 2.8 | 4.9 | | 221 | 221 |
| Zinc, total | µg/L | 150 | 130 | 120 | 250 | 150 | 190 | | 95 | 95 |
| *Toxicity* | | | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | FAIL | FAIL | See Note 8 | See Note 8 | FAIL | PASS | | | |
| Chronic Toxicity, Survival | P/F | PASS | PASS | See Note 8 | See Note 8 | PASS | PASS | | | |
| *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 | | | |

Table 3.22. Results for NPDES Permit TMDL Site 4-351, I-580/80 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 3-Hour Manual | Event 11/15/2015 Full Storm | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 3-Hour Manual | Event 2/17/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 93 | 144 | | | |
| 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 | 56.9 | ND | ND | 31.3 | 118 | 167 | | | |
| 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 | ND | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | ND | ND | ND | | | |

Table 3.22. Results for NPDES Permit TMDL Site 4-351, I-580/80 Interchange[7]

| Constituent[1] | Units | Event 11/1/2015 3-Hour Composite | Event 11/15/2015 3-Hour Manual | Event 11/15/2015 Full Storm | Event 12/3/2015 3-Hour Composite | Event 2/17/2016 3-Hour Manual | Event 2/17/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|---|---|
| Perylene | ng/L | ND | ND | ND | ND | ND | ND | | | |
| Phenanthrene | ng/L | 32 | ND | ND | ND | ND | 87.8 | | | |
| Pyrene | ng/L | 88.7 | ND | ND | 51.6 | 171 | 269 | | | |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | ND | ND | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

SSC = Suspended Solids Concentration

$^{o}$C = degrees Celsius

gpm = gallons per minute

kg/yr = kilograms per year

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the

Table 3.22. Results for NPDES Permit TMDL Site 4-351, I-580/80 Interchange[7]

| | | Event | Event | | Event | Event | | | Reference Values[6] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 11/1/2015 | 11/15/2015 | | 12/3/2015 | 2/17/2016 | | | | Basin |
| | | 3-Hour | 3-Hour | Full | 3-Hour | 3-Hour | Full | TMDL | CTR | Plan |
| Constituent[1] | Units | Composite | Manual | Storm | Composite | Manual | Storm | Limits | Values[5] | Values |

original value and any field duplicate value are provided in Appendix H.

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 PCBs TMDL. All storm water runoff sources share a 2 kg/yr waste load allocation.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at a Caltrans discharge point.
8. Insufficient sample volume to run the toxicity analysis.
9. The values reported for the Nov. 15 and Feb. 17 events were reported by the laboratory as greater-than-or-equal to.
10. The values reported for the Nov. 1, Nov. 15, Dec. 3, and Feb. 17 events were reported by the laboratory as greater-than-or-equal to.

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Table 3.23. Results for NPDES Permit TMDL Site 7-09, Hollywood CSF Outlet[7]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/11/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | |
| Cadmium, total | µg/L | ND | ND | 0.2 | ND | See Notes 2,4 | 10.4 | |
| Copper, total | µg/L | 7.2 | 11 | 18 | 8 | See Notes 2,4 | 28 | |
| Lead, total | µg/L | 1.7 | 5.8 | 7.6 | 2.2 | See Notes 2,4 | 209 | |
| Zinc, total | µg/L | 53 | 81 | 120 | 68 | See Notes 2,4 | 224 | |
| *E. coli* | MPN/100mL | 1600 | | 240 | 280 | See Notes 3,4 | | 235 |
| *Field Measurements* | | | | | | | | |
| pH | pH units | 7.49 | | 7.79 | 8.33 | | | 6.5 to 8.5 |
| Temperature | °C | 14.9 | | 16.1 | 16.2 | | | |
| Average Flow Rate | gpm | 170 | | 102 | 81 | | | |
| *Bacteria* | | | | | | | | |
| Fecal Coliform | MPN/100mL | 1600 | | 240 | 280 | | | |
| *Conventionals* | | | | | | | | |
| Hardness as CaCO3 | mg/L | 14 | 14 | 22 | 12 | | | |
| Nitrate as N | mg/L | 0.31 | 0.24 | 0.24 | 0.21 | | | |
| Oil & Grease | mg/L | ND | | 4 | ND | | | |
| Total Dissolved Solids | mg/L | 28 | 32 | 4 | 20 | | | 950 |
| Total Kjeldahl Nitrogen | mg/L | 0.48 | 0.63 | 3.23 | 0.65 | | | |

Table 3.23. Results for NPDES Permit TMDL Site 7-09, Hollywood CSF Outlet[7]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/11/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Total Phosphorus | mg/L | 0.13 | 0.15 | 0.18 | 0.13 | | | |
| Total Suspended Solids | mg/L | 12 | 49 | 58 | 12 | | | |
| *Elements* | | | | | | | | |
| Aluminum, total | µg/L | 247 | 900.8 | 1049 | 288.4 | | | |
| Chromium, total | µg/L | 1.3 | 2.5 | 2.8 | 0.9 | | 3176 | |
| Iron, total | µg/L | 320 | 1200 | 1400 | 370 | | | |
| *Toxicity* | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | PASS | | FAIL | FAIL | | | |
| Chronic Toxicity, Survival | P/F | 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 | | | |
| 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(e)pyrene | ng/L | ND | ND | ND | ND | | | |
| Benzo(g,h,i)perylene | ng/L | ND | ND | ND | ND | | | |

Table 3.23. Results for NPDES Permit TMDL Site 7-09, Hollywood CSF Outlet[7]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/11/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | ND | | | |
| Biphenyl | ng/L | ND | ND | ND | ND | | | |
| Chrysene | ng/L | ND | ND | ND | ND | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND | | | |
| Dibenzothiophene | ng/L | ND | ND | ND | ND | | | |
| Dimethylnaphthalene, 2,6- | 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 | | | |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND | ND | | | |
| Methylnaphthalene, 2- | ng/L | ND | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | ND | | | |
| Perylene | ng/L | ND | ND | ND | ND | | | |
| Phenanthrene | ng/L | ND | ND | ND | ND | | | |
| Pyrene | ng/L | ND | ND | ND | ND | | | |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | | | |
| Total PAHs | ng/L | ND | ND | ND | ND | | | |

Table 3.23. Results for NPDES Permit TMDL Site 7-09, Hollywood CSF Outlet[7]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/11/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

$^{o}$C = degrees Celsius

gpm = gallons per minute

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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.
3. 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

Table 3.23. Results for NPDES Permit TMDL Site 7-09, Hollywood CSF Outlet[7]

| | | Event 1/5/2016 | | Event 1/31/2016 | Event 3/11/2016 | | Reference Values[6] | |
|---|---|---|---|---|---|---|---|---|
| Constituent[1] | Units | 3-Hour Manual | Full Storm | 3-Hour Composite | 3-Hour Composite | TMDL Limits | CTR Values[5] | Basin Plan Values |

sample bacteria objectives are permitted. The single sample target for E. coli density shall not exceed 235/100 mL.

4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix H for selection of Reference Values.
7. This monitoring site is located at the effluent of a compost storm filter (CSF) BMP.

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*to facilitate double-sided printing.*

Table 3.24. Results for NPDES Permit TMDL Site 7-201, UCLA-1[7]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | |
| Cadmium, total | µg/L | ND | 0.1 | 0.2 | ND | See Notes 2,4 | 10.4 | |
| Copper, total | µg/L | 69 | 75 | 83 | 65 | See Notes 2,4 | 28 | |
| Lead, total | µg/L | 1.4 | 4.7 | 4.4 | 1.5 | See Notes 2,4 | 209 | |
| Zinc, total | µg/L | 210 | 230 | 230 | 180 | See Notes 2,4 | 224 | |
| *E. coli* | MPN/100mL | 1600 | | 130 | 500 | See Notes 3,4 | | 235 |
| *Field Measurements* | | | | | | | | |
| pH | pH units | 8.09 | | 7.83 | 8.08 | | | 6.5 to 8.5 |
| Temperature | $^{o}C$ | 15.2 | | 16 | 16.6 | | | |
| Average Flow Rate | gpm | 90 | | 31 | 55 | | | |
| *Bacteria* | | | | | | | | |
| Fecal Coliform | MPN/100mL | 1600 | | 130 | 500 | | | |
| *Conventionals* | | | | | | | | |
| Hardness as CaCO3 | mg/L | 36 | 32 | 34 | 42 | | | |
| Nitrate as N | mg/L | 1.11 | 1.06 | 1.32 | 1.03 | | | |
| Oil & Grease | mg/L | 2 | | 8 | 3 | | | |
| Total Dissolved Solids | mg/L | 120 | 52 | 8 | 92 | | | 950 |
| Total Kjeldahl Nitrogen | mg/L | 1.88 | 1.61 | 2.15 | 2.64 | | | |

Table 3.24. Results for NPDES Permit TMDL Site 7-201, UCLA-1[7]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Total Phosphorus | mg/L | 0.08 | 0.13 | 0.07 | 0.15 | | | |
| Total Suspended Solids | mg/L | 8 | 32 | 8 | 8 | | | |
| *Elements* | | | | | | | | |
| Aluminum, total | µg/L | 153.5 | 452.3 | 448.6 | 166.5 | | | |
| Chromium, total | µg/L | 2.7 | 3.9 | 3.3 | 2 | | 3176 | |
| Iron, total | µg/L | 360 | 900 | 860 | 400 | | | |
| *Toxicity* | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | FAIL | | FAIL | FAIL | | | |
| Chronic Toxicity, Survival | P/F | FAIL | | FAIL | FAIL | | | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | |
| Acenaphthene | ng/L | ND | ND | ND | ND | | | |
| Acenaphthylene | ng/L | ND | ND | ND | ND | | | |
| Anthracene | ng/L | ND | ND | ND | ND | | | |
| 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(e)pyrene | ng/L | ND | ND | ND | ND | | | |
| Benzo(g,h,i)perylene | ng/L | ND | ND | ND | ND | | | |

Table 3.24. Results for NPDES Permit TMDL Site 7-201, UCLA-1[7]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | ND | | | |
| Biphenyl | ng/L | ND | ND | ND | ND | | | |
| Chrysene | ng/L | ND | ND | ND | ND | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND | | | |
| Dibenzothiophene | ng/L | ND | ND | ND | ND | | | |
| Dimethylnaphthalene, 2,6- | 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 | | | |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND | ND | | | |
| Methylnaphthalene, 2- | ng/L | ND | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | ND | | | |
| Perylene | ng/L | ND | ND | ND | ND | | | |
| Phenanthrene | ng/L | ND | ND | ND | ND | | | |
| Pyrene | ng/L | ND | ND | ND | ND | | | |
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | | | |
| Total PAHs | ng/L | ND | ND | ND | ND | | | |

Table 3.24. Results for NPDES Permit TMDL Site 7-201, UCLA-1[7]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

$^{o}$C = degrees Celsius

gpm = gallons per minute

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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.
3. 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

Table 3.24. Results for NPDES Permit TMDL Site 7-201, UCLA-1[7]

| | | Event 1/5/2016 | | Event 1/31/2016 | Event 3/5/2016 | | Reference Values[6] | |
|---|---|---|---|---|---|---|---|---|
| Constituent[1] | Units | 3-Hour Manual | Full Storm | 3-Hour Composite | 3-Hour Composite | TMDL Limits | CTR Values[5] | Basin Plan Values |

sample bacteria objectives are permitted. The single sample target for *E. coli* density shall not exceed 235/100 mL.

4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at the effluent of a Gross Solids Removal Device BMP.

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Table 3.25. Results for NPDES Permit TMDL Site 7-336, SMB-MC[8]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[7] CTR Values[6] | Reference Values[7] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | |
| Total Coliform[10] | MPN/100mL | 1600 | | 240 | 5000 | See Notes 2,4 | | 10000[2] |
| Fecal Coliform | MPN/100mL | 220 | | 240 | 500 | See Notes 2,4 | | 400[2] |
| Enterococcus | MPN/100mL | 866.4 | | 1119.1 | 2419.6 | See Notes 2,4 | | 104[2] |
| Total Phosphorus | mg/L | 0.13 | 0.18 | 0.16 | 0.12 | See Notes 3,5 | | |
| *Field Measurements* | | | | | | | | |
| pH | pH units | 7.67[9] | | 7.88 | 7.74 | | | 6.5 to 8.5 |
| Temperature | °C | 13.8 | | 16.2 | 15.4 | | | |
| Average Flow Rate | gpm | 89 | | 42 | 276 | | | |
| *Conventionals* | | | | | | | | |
| Hardness as CaCO3 | mg/L | 38 | 32 | 44 | 52 | | | |
| Nitrate as N | mg/L | 0.36 | 0.38 | 0.57 | 0.35 | | | |
| Nitrite as N | mg/L | ND | ND | ND | ND | | | |
| Oil & Grease | mg/L | 4 | | 7 | 1 | | | |
| Total Dissolved Solids | mg/L | 24 | 68 | 72 | 76 | | | 2000 |
| Total Kjeldahl Nitrogen | mg/L | 1.18 | 1.53 | 1.74 | 0.98 | | | |
| Total Suspended Solids | mg/L | 22 | 83 | 67 | 16 | | | |
| *Bacteria* | | | | | | | | |

Table 3.25. Results for NPDES Permit TMDL Site 7-336, SMB-MC[8]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[7] CTR Values[6] | Reference Values[7] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *E. coli* | MPN/100mL | 170 | | 130 | 500 | | | |
| *Elements* | | | | | | | | |
| Aluminum, total | µg/L | 617.8 | 1873 | 1903 | 358.6 | | | |
| Chromium, total | µg/L | 4.7 | 7.9 | 6.1 | 3.4 | | 5405 | |
| Copper, total | µg/L | 34 | 59 | 54 | 27 | | 5.8 | |
| Iron, total | µg/L | 630 | 2200 | 2200 | 490 | | | |
| Lead, total | µg/L | 2.3 | 7.5 | 5.8 | 1.2 | | 221 | |
| Zinc, total | µg/L | 95 | 250 | 200 | 82 | | 95 | |
| *Toxicity* | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | FAIL | | FAIL | FAIL | | | |
| Chronic Toxicity, Survival | P/F | PASS | | FAIL | 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 | | | |
| 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 | | | |

Table 3.25. Results for NPDES Permit TMDL Site 7-336, SMB-MC[8]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[7] CTR Values[6] | Reference Values[7] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Benzo(e)pyrene | 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 | | | |
| Biphenyl | ng/L | ND | ND | ND | ND | | | |
| Chrysene | ng/L | ND | ND | ND | ND | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND | | | |
| Dibenzothiophene | ng/L | ND | ND | ND | ND | | | |
| Dimethylnaphthalene, 2,6- | 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 | | | |
| Methylnaphthalene, 1- | ng/L | ND | ND | ND | ND | | | |
| Methylnaphthalene, 2- | ng/L | ND | ND | ND | ND | | | |
| Methylphenanthrene, 1- | ng/L | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | ND | ND | ND | ND | | | |
| Perylene | ng/L | ND | ND | ND | ND | | | |
| Phenanthrene | ng/L | ND | ND | ND | ND | | | |
| Pyrene | ng/L | ND | ND | ND | ND | | | |

Table 3.25. Results for NPDES Permit TMDL Site 7-336, SMB-MC[8]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[7] CTR Values[6] | Reference Values[7] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Trimethylnaphthalene, 2,3,5- | ng/L | ND | ND | ND | ND | | | |
| Total PAHs | ng/L | ND | ND | ND | ND | | | |

Abbreviations & Acronyms:

CN = Constituent not analyzed for/calculated in the storm event

ND = Non-detect

P/F = Pass/Fail

$^{o}$C = degrees Celsius

gpm = gallons per minute

mg/L = milligrams per liter

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. Malibu Creek and Lagoon Bacteria TMDL. No exceedances are allowed for the geometric mean limits. The allowable days of exceedance for the single sample limits differ depending on season, dry weather or wet weather, and by sampling locations. This site drains to the lagoon,

Table 3.25. Results for NPDES Permit TMDL Site 7-336, SMB-MC[8]

| Constituent[1] | Units | Event 1/5/2016 3-Hour Manual | Event 1/5/2016 Full Storm | Event 1/31/2016 3-Hour Composite | Event 3/5/2016 3-Hour Composite | TMDL Limits | Reference Values[7] CTR Values[6] | Reference Values[7] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|

which is considered marine waters. For marine waters, the single sample bacteria standard for: Total Coliform is 10,000 or 1,000 if (fecal coliform)/(total coliform) > 0.1; Fecal Coliform is 400; and *Enterecoccus* is 104.

3. Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients. The concentration-based waste load allocation for Total Phosphorus in the Winter (Nov. 16 through Apr. 14) is 0.2 mg/L and in the summer (Apr. 15 through Nov. 15) is 0.1 mg/L. The concentration-based waste load allocation for Total nitrogen in the Winter (Nov. 16 through Apr. 14) is 4 mg/L and in the summer (Apr. 15 through Nov. 15) is 1 mg/L.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit; and Total Maximum Daily Loads for Bacteria in the Malibu Creek Watershed US Environmental Protection Agency Region 9.
5. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
6. 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.
7. See Appendix I for selection of Reference Values.
8. This monitoring site is located at a Caltrans discharge point.
9. Two pH values are reported for this storm event. One pH value is a field measurement which is reported in the table. The other value is a laboratory measurement of 6.6 which is included in Appendix H.
10. The value reported for the Jan. 5 event was reported by the laboratory as greater-than-or-equal to.

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Table 3.26. Results for NPDES Permit TMDL Site 12-330, 1149L Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | |
| *Chlorinated Pesticides* | | | | | | | | |
| Toxaphene | ng/L | ND | ND | ND | ND | See Notes 2,4 | 730 | |
| *Elements* | | | | | | | | |
| Cadmium, dissolved | µg/L | 0.109 | 0.043 | 0.045 | 0.033 | See Notes 2,3 | 10.8 | |
| Copper, dissolved | µg/L | 15.939 | 12.602 | 13.501 | 11.523 | See Notes 2,3 | 30.2 | |
| Lead, dissolved | µg/L | 0.05 | 0.069 | 0.04 | 0.03 | See Notes 2,3 | 162 | |
| Zinc, dissolved | µg/L | 5.11 | 9.17 | 10.71 | 9.97 | See Notes 2,3 | 243 | |
| *DDT* | | | | | | | | |
| DDD(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDD(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDE(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDE(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDT(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDT(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| *Field Measurements* | | | | | | | | |
| pH | pH units | 7.6 | 7.27 | 7.11 | | | | 6.5 to 8.5 |
| Temperature | °C | 22.4 | 13.7 | 14.9 | | | | |

Table 3.26. Results for NPDES Permit TMDL Site 12-330, 1149L Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Average Flow Rate | gpm | 10 | 21 | 8.7 | | | | |
| *Bacteria* | | | | | | | | |
| Fecal Coliform | MPN/100mL | 5000 | 1400 | 900 | | | | |
| *Conventionals* | | | | | | | | |
| Hardness as CaCO3 | mg/L | 254 | 90 | 146 | 116 | | | |
| Nitrate as N | mg/L | 11.5 | 1.7 | 0.48 | 0.28 | | | |
| Oil & Grease | mg/L | ND | 1 | ND | | | | |
| Total Dissolved Solids | mg/L | 444 | 148 | 176 | 156 | | | 1500 |
| Total Kjeldahl Nitrogen | mg/L | 1.63 | 0.98 | 1.17 | 0.49 | | | |
| Total Phosphorus | mg/L | 0.12 | 0.26 | 0.17 | 0.12 | | | |
| Total Suspended Solids | mg/L | 1 | 8 | 7 | 3 | | | |
| *Elements* | | | | | | | | |
| Aluminum, total | µg/L | 62.52 | 375.82 | 226.6 | 161.3 | | | |
| Chromium, total | µg/L | 1.16 | 2.59 | 0.73 | 1.33 | | 3508 | |
| Copper, total | µg/L | 19.08 | 16.305 | 15.34 | 12.539 | | 31.4 | |
| Iron, total | µg/L | 504.29 | 381.5 | 255.25 | 203.31 | | | |
| Lead, total | µg/L | 0.469 | 0.469 | 0.257 | 0.193 | | 244 | |
| Zinc, total | µg/L | 9.21 | 15.75 | 14.19 | 13.13 | | 248 | |

Table 3.26. Results for NPDES Permit TMDL Site 12-330, 1149L Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *Toxicity* | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | PASS | PASS | PASS | PASS | | | |
| Chronic Toxicity, Survival | P/F | PASS | PASS | PASS | PASS | | | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | |
| Acenaphthene | ng/L | 7.4 | 4.1 | ND | ND | | | |
| Acenaphthylene | ng/L | ND | ND | ND | ND | | | |
| Anthracene | ng/L | ND | ND | ND | 1.4 | | | |
| Benz(a)anthracene | ng/L | ND | ND | 2.8 | 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 | 1 | ND | ND | | | |
| Benzo(k)fluoranthene | ng/L | ND | ND | ND | ND | | | |
| Chrysene | ng/L | ND | 1.6 | ND | 1.4 | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND | | | |
| Fluoranthene | ng/L | ND | 2 | ND | 1.2 | | | |
| Fluorene | ng/L | ND | 4 | ND | ND | | | |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | 5.7 | 5.5 | ND | 3.6 | | | |

Table 3.26. Results for NPDES Permit TMDL Site 12-330, 1149L Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Phenanthrene | ng/L | ND | 2.4 | 2.1 | 1 | | | |
| Pyrene | ng/L | ND | 3.7 | 1.6 | 1.5 | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

$^{o}$C = degrees Celsius

cfs = cubic feet per second

gpm = gallons per minute

gm/yr = grams per year

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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

Table 3.26. Results for NPDES Permit TMDL Site 12-330, 1149L Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|

chlordane and PCBs are now informational TMDLs with no associated waste load allocations.

3. San Diego Creek and Newport Bay Toxics TMDL. Waste load allocations for cadmium, copper, lead, and zinc based on receiving water flow.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at the effluent of a Bioretention BMP.

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Table 3.27. Results for NPDES Permit TMDL Site 12-336, 1194 Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | |
| *Chlorinated Pesticides* | | | | | | | | |
| Toxaphene | ng/L | ND | ND | ND | ND | See Notes 2,4 | 730 | |
| *Elements* | | | | | | | | |
| Cadmium, dissolved | µg/L | 0.07 | 0.068 | 0.028 | 0.034 | See Notes 2,3 | 10.8 | |
| Copper, dissolved | µg/L | 14.003 | 15.46 | 14.266 | 13.017 | See Notes 2,3 | 30.2 | |
| Lead, dissolved | µg/L | 0.033 | 0.058 | 0.031 | 0.021 | See Notes 2,3 | 162 | |
| Zinc, dissolved | µg/L | 11.88 | 5.36 | 2.76 | 3.46 | See Notes 2,3 | 243 | |
| *DDT* | | | | | | | | |
| DDD(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDD(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDE(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDE(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDT(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDT(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| *Field Measurements* | | | | | | | | |
| pH | pH units | 7.51 | 8.23 | 6.95 | | | | 6.5 to 8.5 |
| Temperature | °C | 23.21 | 14.5 | 17.6 | | | | |

Table 3.27. Results for NPDES Permit TMDL Site 12-336, 1194 Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Average Flow Rate | gpm | 4.6 | 25 | 16 | | | | |
| *Bacteria* | | | | | | | | |
| Fecal Coliform[8] | MPN/100mL | 160000 | 3500 | 80 | | | | |
| *Conventionals* | | | | | | | | |
| Hardness as CaCO3 | mg/L | 106 | 52 | 60 | 48 | | | |
| Nitrate as N | mg/L | 2.15 | 1.6 | ND | 0.33 | | | |
| Oil & Grease | mg/L | 1.1 | 1.3 | 1.3 | | | | |
| Total Dissolved Solids | mg/L | 236 | 132 | 96 | 88 | | | 1500 |
| Total Kjeldahl Nitrogen | mg/L | 1.42 | 0.7 | 0.86 | 1.29 | | | |
| Total Phosphorus | mg/L | 0.6 | 0.31 | 0.28 | 0.19 | | | |
| Total Suspended Solids | mg/L | 5 | 5 | 9 | ND | | | |
| *Elements* | | | | | | | | |
| Aluminum, total | µg/L | 53.62 | 314.66 | 384.38 | 295.37 | | | |
| Chromium, total | µg/L | 0.96 | 2.33 | 1 | 1.68 | | 3508 | |
| Copper, total | µg/L | 15.018 | 17.626 | 15.522 | 14.177 | | 31.4 | |
| Iron, total | µg/L | 108.49 | 287.03 | 332.6 | 251.72 | | | |
| Lead, total | µg/L | 0.147 | 0.356 | 0.273 | 0.201 | | 244 | |
| Zinc, total | µg/L | 16.29 | 18.34 | 5.94 | 6.05 | | 248 | |

Table 3.27. Results for NPDES Permit TMDL Site 12-336, 1194 Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *Toxicity* | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | PASS | PASS | PASS | PASS | | | |
| Chronic Toxicity, Survival | P/F | PASS | PASS | PASS | PASS | | | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | |
| Acenaphthene | ng/L | 2 | 11.8 | ND | ND | | | |
| Acenaphthylene | ng/L | ND | ND | ND | ND | | | |
| Anthracene | ng/L | ND | 3.1 | ND | 2.4 | | | |
| Benz(a)anthracene | ng/L | ND | ND | 1.3 | 5.6 | | | |
| 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 | 2.2 | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | ND | ND | | | |
| Fluoranthene | ng/L | ND | 6.1 | ND | 3.9 | | | |
| Fluorene | ng/L | 4 | ND | ND | 1.5 | | | |
| Indeno(1,2,3-c,d)pyrene | ng/L | ND | ND | ND | ND | | | |
| Naphthalene | ng/L | 7.7 | 7.5 | 4.3 | 6.6 | | | |

Table 3.27. Results for NPDES Permit TMDL Site 12-336, 1194 Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Phenanthrene | ng/L | 1.8 | 10.2 | 5.5 | 9 | | | |
| Pyrene | ng/L | 1.5 | 2.3 | ND | 2.5 | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

$^{o}$C = degrees Celsius

cfs = cubic feet per second

gpm = gallons per minute

gm/yr = grams per year

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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

Table 3.27. Results for NPDES Permit TMDL Site 12-336, 1194 Outlet[7]

| Constituent[1] | Units | Event 10/5/2015 3-Hour Composite | Event 1/4/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|

chlordane and PCBs are now informational TMDLs with no associated waste load allocations.

3. San Diego Creek and Newport Bay Toxics TMDL. Waste load allocations for cadmium, copper, lead, and zinc based on receiving water flow.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix H for selection of Reference Values.
7. This monitoring site is located at the effluent of a Austin Sand Filter BMP.
8. The value reported for the Oct. 5 event was reported by the laboratory as greater-than-or-equal to.

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Table 3.28. Results for NPDES Permit TMDL Site 12-356, 1180R[7]

| Constituent[1] | Units | Event 1/4/2016 3-Hour Composite | Event 2/17/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | |
| *Chlorinated Pesticides* | | | | | | | | |
| Toxaphene | ng/L | ND | ND | ND | ND | See Notes 2,4 | 730 | |
| *Elements* | | | | | | | | |
| Cadmium, dissolved | µg/L | 0.057 | 0.063 | 0.058 | 0.069 | See Notes 2,3 | 10.8 | |
| Copper, dissolved | µg/L | 32.8 | 37.391 | 24.109 | 24.524 | See Notes 2,3 | 30.2 | |
| Lead, dissolved | µg/L | 0.182 | 0.125 | 0.075 | 0.1 | See Notes 2,3 | 162 | |
| Zinc, dissolved | µg/L | 95.12 | 85.7 | 60.16 | 51.51 | See Notes 2,3 | 243 | |
| *DDT* | | | | | | | | |
| DDD(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDD(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDE(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDE(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDT(o,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| DDT(p,p') | ng/L | ND | ND | ND | ND | See Notes 2,4 | | |
| *Field Measurements* | | | | | | | | |
| pH | pH units | 8.02 | 7.12 | 7.85 | | | | 6.5 to 8.5 |
| Temperature | °C | 12.9 | 11.61 | 15 | | | | |

Table 3.28. Results for NPDES Permit TMDL Site 12-356, 1180R[7]

| Constituent[1] | Units | Event 1/4/2016 3-Hour Composite | Event 2/17/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Average Flow Rate | gpm | 148 | 48 | 37 | | | | |
| *Bacteria* | | | | | | | | |
| Fecal Coliform | MPN/100mL | 2800 | 1700 | 900 | | | | |
| *Conventionals* | | | | | | | | |
| Hardness as CaCO3 | mg/L | 18 | 32 | 50 | 44 | | | |
| Nitrate as N | mg/L | 0.54 | 1.69 | 0.2 | 0.4 | | | |
| Oil & Grease | mg/L | 3.6 | 3.1 | 1.3 | | | | |
| Total Dissolved Solids | mg/L | 52 | 88 | 60 | 48 | | | 1500 |
| Total Kjeldahl Nitrogen | mg/L | 1.81 | 4.38 | 1.31 | 0.86 | | | |
| Total Phosphorus | mg/L | 0.34 | 0.22 | 0.19 | 0.22 | | | |
| Total Suspended Solids | mg/L | 42 | 22 | 22 | ND | | | |
| *Elements* | | | | | | | | |
| Aluminum, total | µg/L | 688.43 | 211.04 | 331.38 | 292.94 | | | |
| Chromium, total | µg/L | 5.64 | 2.6 | 1.64 | 2.13 | | 3508 | |
| Copper, total | µg/L | 55.086 | 47.781 | 30.236 | 29.991 | | 31.4 | |
| Iron, total | µg/L | 1062.01 | 310.23 | 509.53 | 411.97 | | | |
| Lead, total | µg/L | 3.074 | 1.668 | 1.116 | 0.908 | | 244 | |
| Zinc, total | µg/L | 178.94 | 123.95 | 88.43 | 73.52 | | 248 | |

Table 3.28. Results for NPDES Permit TMDL Site 12-356, 1180R[7]

| Constituent[1] | Units | Event 1/4/2016 3-Hour Composite | Event 2/17/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| *Toxicity* | | | | | | | | |
| Chronic Toxicity, Biomass | P/F | FAIL | PASS | PASS | PASS | | | |
| Chronic Toxicity, Survival | P/F | FAIL | PASS | PASS | PASS | | | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | |
| Acenaphthene | ng/L | 6.6 | 3.1 | ND | ND | | | |
| Acenaphthylene | ng/L | 5.3 | 3.1 | ND | 1.2 | | | |
| Anthracene | ng/L | 3.1 | 5.8 | 3.9 | 4.9 | | | |
| Benz(a)anthracene | ng/L | 7.6 | 4.1 | 2.2 | 6.1 | | | |
| Benzo(a)pyrene | ng/L | 9 | ND | 9.4 | 2.8 | | | |
| Benzo(b)fluoranthene | ng/L | 13.1 | ND | 14.8 | 13.9 | | | |
| Benzo(g,h,i)perylene | ng/L | 47.8 | 20.1 | 30.9 | 17.6 | | | |
| Benzo(k)fluoranthene | ng/L | 4.5 | ND | 6.1 | 2.4 | | | |
| Chrysene | ng/L | 36 | 4.5 | 13.8 | 9.9 | | | |
| Dibenz(a,h)anthracene | ng/L | ND | ND | 1.6 | 1.9 | | | |
| Fluoranthene | ng/L | 49.7 | 31.8 | 71.2 | 11 | | | |
| Fluorene | ng/L | 3.9 | 4 | ND | 3.6 | | | |
| Indeno(1,2,3-c,d)pyrene | ng/L | 6.5 | ND | 8.1 | 7.8 | | | |
| Naphthalene | ng/L | 19.8 | 13.5 | 5.6 | 6.6 | | | |

Table 3.28. Results for NPDES Permit TMDL Site 12-356, 1180R[7]

| Constituent[1] | Units | Event 1/4/2016 3-Hour Composite | Event 2/17/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|
| Phenanthrene | ng/L | 36.6 | 40 | 29.2 | 26.2 | | | |
| Pyrene | ng/L | 88.5 | 53.5 | 311.1 | 16.5 | | | |

Abbreviations & Acronyms:

ND = Non-detect

P/F = Pass/Fail

$^{o}$C = degrees Celsius

cfs = cubic feet per second

gpm = gallons per minute

gm/yr = grams per year

MPN/100mL = most probable number in 100 milliliters

ng/L = nanograms per liter

µg/L = micrograms per liter

Notes:

1. For the 2014-15 MRR, if a field duplicate was collected for a storm event, the results presented in the TMDL data tables were the average of the original sample and duplicate sample. For the 2015-16 MRR, only the original values are presented in the data tables. Both the original value and any field duplicate value are provided in Appendix H.
2. 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

Table 3.28. Results for NPDES Permit TMDL Site 12-356, 1180R[7]

| Constituent[1] | Units | Event 1/4/2016 3-Hour Composite | Event 2/17/2016 3-Hour Composite | Event 3/6/2016 3-Hour Composite | Event 3/6/2016 Full Storm | TMDL Limits | Reference Values[6] CTR Values[5] | Reference Values[6] Basin Plan Values |
|---|---|---|---|---|---|---|---|---|

chlordane and PCBs are now informational TMDLs with no associated waste load allocations.

3. San Diego Creek and Newport Bay Toxics TMDL. Waste load allocations for cadmium, copper, lead, and zinc based on receiving water flow.
4. Source: Order WQ 2014-0077-DWQ Amendment to State Water Board Order 2012-0011-DWQ Department of Transportation Statewide Storm Water Permit.
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.
6. See Appendix I for selection of Reference Values.
7. This monitoring site is located at the effluent of a Detention Basin BMP.

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# Section 4
# TIER 2 MONITORING

The total number of Tier 1 sites exceeded the NPDES Permit requirement of 100; therefore, no Tier 2 sites were monitored during the 2015–16 season.

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# Section 5
# CORRECTIVE ACTION

## 5.1 ASBS SITES

The state is divided into three regions for ASBS monitoring—each region has a distinct set of NWQ values. The NWQ values are presented in Section 2.3.1. Table 5.01 lists the constituents that exceed natural water quality, by ASBS, that have been identified to date. The exceedances are shown in the cumulative data tables provided in Appendix E.

Table 5.01. ASBS Exceedances to Date

| ASBS | Ocean Receiving Water Site ID | Constituents that Exceed Natural Water Quality (to Date) |
|---|---|---|
| ASBS 05 (Saunders) | 1-338 | Selenium |
| ASBS 08 (Redwood) | 1-323 | None |
| ASBS 09 (Fitzgerald) | 4-342 | See Note 1 |
| ASBS 15 (Ano Nuevo) | 4-346 | See Note 1 |
| ASBS 34 (Carmel Bay) | 5-305 | See Note 1 |
| ASBS 24 (Laguna to Latigo) | 7-369 | None |
| ASBS 33 (Irvine Coast) | 12-350 | Selenium, Copper |

Notes:

1. Caltrans is working with the other Central Coast RMG dischargers on a consistent approach to apply the NWQ values for the determination of exceedances.

### 5.1.1 Corrective Action for Sites in the No. CA RMG

The recommended number of storm events (six) has been captured at ASBS 05 (Saunders). One exceedance has been identified for selenium. Caltrans believes this exceedance is due to elevated natural background levels of selenium in the watershed. Caltrans has proposed to the State Water Board that monitoring for the 2016–17 season be suspended while Caltrans conducts a source identification study. No corrective actions are planned at this time for ASBS 08 (Redwood) since no exceedances have been identified to date.

### 5.1.2 Corrective Action for Sites in the Ce. Coast RMG

No corrective actions are planned at this time for ASBS 09 (Fitzgerald), ASBS 15 (Ano Nuevo), and ASBS 34 (Carmel Bay). Caltrans is working with the other Central Coast RMG dischargers on a consistent approach to apply the NWQ values for the determination of exceedances. This effort is expected to be completed by October 2016. Once this effort is completed and the exceedances determined, Caltrans staff will update State Water Board staff on exceedances and corrective actions.

### 5.1.3 Corrective Action for Sites in the So. CA RMG

No corrective actions are planned at this time for ASBS 24 (Laguna to Latigo) since no exceedances have been identified to date. The recommended number of storm events (six) has been captured at ASBS 33 (Irvine Coast). Two exceedances have been identified: one for selenium and one for copper. Caltrans believes the selenium exceedance is due to elevated natural background levels of selenium in the watershed.

Caltrans investigated the potential contribution of selenium from the adjacent Highway 1 slopes to stormwater runoff conveyed to the ASBS 33 ORW site. The study consisted of collecting soil samples from sites within its right-of-way. The soil samples were analyzed to assess the amount of selenium in the sample and in the sample leachate. Caltrans also conducted a preliminary literature review into the background concentrations of the local watershed. Based on the initial findings of the study and literature review, Caltrans estimates that the selenium exceedance observed at the ASBS ORW site is due to the elevated, natural background concentration of selenium upstream from the site. Caltrans submitted a memorandum to the State Water Board in March 2016, requesting release from the ASBS monitoring requirements at ASBS 33.

The outfall concentrations for selenium are compared to the Ocean Plan Instantaneous Maximum in Table 5.02. As seen in the table, none of the outfall concentrations exceed the Ocean Plan Instantaneous Maximum. The outfall concentrations for copper are compared to the Ocean Plan Instantaneous Maximum in Table 5.03. As seen in the table, all of the outfall concentrations, except for Site 12-353, exceed the Ocean Plan Instantaneous Maximum.

Table 5.02. Comparison of Selenium Outfall Concentrations to the Ocean Plan Instantaneous Maximum[1]

| Site ID | Site Name | Outfall Type[2] | Event 1/5/2016 | Event 2/17/2016 | Event 3/6/2016 | Ocean Plan Instantaneous Max (µg/L)[3] |
|---|---|---|---|---|---|---|
| 12-350 | IRV007 | CO | 0.12 | 0.067 | 0.08 | 150 |
| 12-352 | IRV002 | UO | 15.97 | NA | NA | 150 |
| 12-353 | IRV009 | UO | 0.07 | NA | NA | 150 |
| 12-354 | IRV020 | UO | 0.04 | NA | NA | 150 |

Abbreviations and Acronyms:

CO = Coupled Outfall

NA = Not Applicable

UO = Uncoupled Outfall

Notes:

1. Numbers have been rounded to the nearest hundredth for reporting purposes.
2. Coupled outfalls are sampled three times per season; and uncoupled outfalls are sampled once per season.
3. Source: California Ocean Plan, Table 1 (formerly Table B).

Table 5.03. Comparison of Copper Outfall Concentrations to the Ocean Plan Instantaneous Maximum[1]

| Site ID | Site Name | Outfall Type | Event 1/5/2016 | Event 2/17/2016 | Event 3/6/2016 | Ocean Plan Instantaneous Max (µg/L) |
|---|---|---|---|---|---|---|
| 12-350 | IRV007 | CO | 36.43 | 35.48 | 57.31 | 30 |
| 12-352 | IRV002 | UO | 113.96 | NA | NA | 30 |
| 12-353 | IRV009 | UO | 7.23 | NA | NA | 30 |
| 12-354 | IRV020 | UO | 33.32 | NA | NA | 30 |

Abbreviations and Acronyms:

CO = Coupled Outfall

NA = Not Applicable

UO = Uncoupled Outfall

Notes:

1. Numbers have been rounded to the nearest hundredth for reporting purposes.
2. Coupled outfalls are sampled three times per season; and uncoupled outfalls are sampled once per season.
3. Source: California Ocean Plan, Table 1 (formerly Table B).

At the time this MRR was submitted, Caltrans staff continues to work with State Water Board staff on corrective actions for ASBS 33.

### 5.1.4 2016–17 ASBS Monitoring Effort

Table 2.07 shows that at some ASBS sites the cumulative number of storm events captured lags the minimum number of targeted events. However, no changes to the mobilization criteria are planned. Monitoring activities will continue at sites within ASBS 08 (Redwood), ASBS 15 (Ano Nuevo), ASBS 34 (Carmel Bay) and ASBS 24 (Mugo to Latigo) to reach the minimum number of storm events (6). An effort to locate and approve a new coupled outfall site with a new ocean receiving water site in ASBS 24 is underway. Monitoring activities will also continue at sites within ASBS 33 (Irvine Coast) at the direction of the State Water Board. A reduced constituent list is anticipated for the monitoring effort in ASBS 33 (Irvine Coast).

## 5.2 TMDL SITES

Previously, TMDL sites in the Chollas Creek and Rainbow Creek watersheds were identified for corrective action. Modular infiltration trenches have now been installed at two Chollas Creek sites (Sites 11-343 & 11-344 and 11-345 & 11-346) and monitoring of these sites has commenced. At the Rainbow Creek site (Site 11-332), a soil nutrient study was conducted to identify the source of nutrients.

### 5.2.1 2016–17 TMDL Monitoring Effort

Table 3.06 shows that at some TMDL sites the cumulative number of storm events captured lags the number of targeted events. However, no changes to the mobilization criteria are planned. Caltrans plans to continue monitoring TMDL sites until a sufficient number of events are captured to assess if corrective actions are required.

# Section 6
# REFERENCES

State Water Resources Control Board (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

## Changes in the Number of Sites from the 2015–16 MRR

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## Appendix A
## Changes in the number of sites from the 2014–15 MRR

The total number of Tier 1 sites remained the same. However, the following changes occurred:

1. The number of ASBS sites remained the same. One site was replaced with an alternate site, and one site was renamed.

    - Site 7-344 was replaced with Site 7-400. Monitoring at Site 7-344 was halted due to a landslide in March 2015.

    - Site 4-349 was renamed to Site 4-353—only the site identification number changed not the location. Site 4-349 was inadvertently assigned to two locations—one for ASBS monitoring and one for TMDL monitoring. Therefore, a new site identification number was assigned to the ASBS site.

2. The number of TMDL sites remained the same. Several sites were replaced with an alternate site.

    Chollas Creek TMDL Monitoring Project

    - Site 11-100 was removed from monitoring. Site 11-100 served as a monitoring site during the construction phase of a Modular Infiltration Trench System BMP along I-805. Construction is complete, and this site is no longer needed.

    - Monitoring at Site 11-342 has been suspended until construction of a Biostrip and Bioswale BMP system along HWY28 is completed.

    - Site 11-344 was added. This site is located at the effluent of an Infiltration Trench BMP at the I-15/SR94 intersection.

    - Site 11-346 was added. This site is located at the effluent of an Infiltration Trench BMP at the I-15/Market St. intersection.

NPDES Permit TMDL Monitoring Project

- Site 3-217 was replaced with Site 3-397 for the TMDL Monitoring Program. Monitoring at Site ID 3-217 was discontinued after the completion of the 2014–15 season due to the lack of sufficient runoff for water quality sampling. A nearby location, Site 3-397, was identified as a more suitable site, and monitoring at this new location began at the start of the 2015–16 season.

# APPENDIX B

## ASBS
## Additional Information

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# Appendix B
# ASBS Additional Information

## B.1 ASBS 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 B.1.

Table B.1. Regional Monitoring Groups with Associated ASBS

| Northern California Regional Monitoring Group | Central Coast Regional Monitoring Group | Southern California Regional Monitoring Group |
|---|---|---|
| ASBS 5 (Saunders) | ASBS 9 (Fitzgerald) | ASBS 24 (Mugu to Latigo) |
| ASBS 8 (Redwoods) | ASBS 15 (Ano Nuevo) | ASBS 33 (Irvine Coast) |
| | ASBS 34 (Carmel Bay) | |

## B.2 HISTORICAL MONITORING AND REPORTING RESPONSIBILITES

Tables B.2 and B.4 summarize the monitoring responsibilities by organization with respect to outfall monitoring, ORW monitoring, and ORA monitoring. Tables B.3 and B.5 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.

### B.2.1 2012–13 Season

For the 2012–13 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 B.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 uncoupled outfalls.

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

### B.2.2 2013–14 Season

For the 2013–14 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 B.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 uncoupled 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 B.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.

### B.2.3 2014–15 Season

For the 2014–15 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 season. The data from the 2014–15 season will be presented in a final report following the 2015–16 season.

Table B.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 uncoupled outfalls.
2. Caltrans monitored two ORA sites: one for ASBS 5 (Saunders) and one for ASBS 8 (Redwoods). The other dischargers from the No. CA RMG monitored the remaining ORA sites.

Table B.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 season. The data collected for the 2014–15 season will be presented in the final report, which will include all wet seasons. The final report is anticipated in 2016.
3. Monitoring is complete.

# APPENDIX C

## ASBS
## Annual Runoff Volume Estimate

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# Appendix C
# ASBS Annual Runoff Volume Estimate

Table C.1 presents the seasonal runoff volumes that were estimated at the monitored ASBS outfall locations. Annual runoff volumes 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

Table C.1. 2015–16 Seasonal Runoff Volume Estimates for ASBS Sites[1]

| Site ID | Site Name | Seasonal Runoff Volume Estimate ($ft^3$) | Site ID | Site Name | Seasonal Runoff Volume Estimate ($ft^3$) |
|---|---|---|---|---|---|
| **ASBS 05** | | | | | |
| 1-325 | SAU019A | 6,018 | 1-330 | SAU011A | 15,747 |
| 1-326 | SAU020A | 34,905 | 1-331 | SAU008 | 24,774 |
| 1-327 | SAU015 | 10,532 | 1-334 | SAU009A | 16,449 |
| 1-328 | SAU014 | 22,668 | 1-335 | SAU006A | 17,352 |
| 1-329 | SAU013A | 9,428 | 1-337 | SAU016A | 15,145 |
| **ASBS 08** | | | | | |
| 1-317 | RED014 | 30,492 | 1-322 | RED028 | 304,919 |
| 1-318 | RED015 | 83,160 | 1-324 | RED027 | 49,896 |
| 1-320 | RED017A | 72,072 | 1-336 | RED018A | 44,352 |
| 1-321 | RED023 | 363,130 | | | |
| **ASBS 9** | | | | | |
| 4-341 | FIT012 | 56,444 | | | |
| **ASBS 15** | | | | | |
| 4-343 | ANO001 | 101,593 | 4-348 | ANO035 | 30,315 |
| 4-344 | ANO030 | 32,842 | 4-353[1] | ANO002 | 12,271 |
| 4-345 | ANO033 | 20,932 | | | |
| **ASBS 34** | | | | | |
| 5-303 | CAR006 | 4,191 | 5-304 | CAR007B | 6,286 |
| **ASBS 24** | | | | | |
| 7-343 | MUG005 | 11,812 | 7-368 | MUG283 | 0[2] |
| 7-345 | MUG010 | 25,939 | 7-370 | MUG346 | 15,322 |
| 7-346 | MUG013 | 6,930 | 7-371 | MUG355 | 80,018 |
| 7-347 | MUG016 | 6,142 | 7-372 | SAD0950 | 71,965 |
| 7-348 | MUG028 | 6,772 | 7-373 | SAD0960 | 53,123 |
| 7-349 | MUG031 | 10,080 | 7-374 | SAD0970 | 48,480 |
| 7-350 | MUG041 | 11,025 | 7-375 | SAD0980 | 50,241 |
| 7-351 | MUG046 | 19,372 | 7-376 | SAD0990 | 42,208 |
| 7-352 | MUG048 | 10,867 | 7-377 | SAD1000 | 32,841 |
| 7-353 | MUG049 | 12,273 | 7-378 | SAD1040 | 53,705 |
| 7-354 | MUG051 | 37,515 | 7-379 | SAD1050 | 87,917 |
| 7-355 | MUG053 | 41,183 | 7-380 | SAD1060 | 50,390 |

| Site ID | Site Name | Seasonal Runoff Volume Estimate ($ft^3$) | Site ID | Site Name | Seasonal Runoff Volume Estimate ($ft^3$) |
|---|---|---|---|---|---|
| 7-356 | MUG058 | 8,133 | 7-381 | SAD1030 | 51,289 |
| 7-357 | MUG059 | 18,922 | 7-383 | MUG318 | 28,057 |
| 7-358 | MUG061 | 6,141 | 7-384 | ALT004 | 6,109 |
| 7-359 | MUG066 | 28,753 | 7-385 | ALT005 | 17,434 |
| 7-360 | MUG070 | 16,694 | 7-386 | ALT006 | 6,407 |
| 7-361 | MUG073 | 10,955 | 7-388 | ALT008 | 4,917 |
| 7-362 | MUG077 | 1,575 | 7-389 | ALT009 | 3,427 |
| 7-363 | MUG078 | 13,943 | 7-390 | ALT010 | 945 |
| 7-364 | MUG135 | 43,089 | 7-391 | ALT011 | 14,996 |
| 7-365 | MUG147 | 35,949 | 7-393 | ALT017 | 17,971 |
| 7-366 | MUG150 | 38,546 | 7-400[3] | ALT018 | 8,820 |
| 7-367 | MUG187 | 155,203 | | | |
| **ASBS 33** | | | | | |
| 12-350 | IRV007 | 53,631 | 12-354 | IRV020 | 144,506 |
| 12-352 | IRV002 | 83,426 | 12-358 | IRV001 | 26,816 |
| 12-353 | IRV009 | 74,488 | | | |

Notes:

1. Site 4-353 was previously listed as Site 4-349. Only the site identification number changed not the location. Site 4-349 was inadvertently assigned to two locations—one for ASBS monitoring and one for TMDL monitoring. Therefore, a new site identification number was assigned to the ASBS site.
2. Site 7-368 is the coupled outfall, and the estimated annual runoff is calculated at 22,418 $ft^3$. However, the value reported is 0 due to the sand berm that is blocking the runoff from reaching the ocean. The runoff is ponding behind the sand berm.
3. Site 7-400 replaces Site 7-344. Monitoring at Site 7-344 was halted due to a landslide in March 2015.

# APPENDIX D

## ASBS
## List of Actively Monitored Sites

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# Appendix D
# List of Tables


| Table | Title |
|---|---|
| D.1 | ASBS 5 Monitoring Sites |
| D.2 | ASBS 8 Monitoring Sites |
| D.3 | ASBS 9 Monitoring Sites |
| D.4 | ASBS 15 Monitoring Sites |
| D.5 | ASBS 34 Monitoring Sites |
| D.6 | ASBS 24 Monitoring Sites |
| D.7 | ASBS 33 Monitoring Sites |

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Tables D.1 through D.7 list the actively monitored sites for the ASBS Monitoring Program for the 2015–16 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 D.1. ASBS 5 Monitoring Sites

| Site ID | Site Name | Monitoring Type | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| 1-325 | SAU019A | Outfall, 18"–36" | 1 | 38.86067 | -123.65280 |
| 1-326 | SAU020A | Outfall, 18"–36" | 1 | 38.85916 | -123.65273 |
| 1-327 | SAU015 | Outfall, 18"–36" | 1 | 38.85612 | -123.65178 |
| 1-328 | SAU014 | Outfall, 18"–36" | 1 | 38.85510 | -123.65170 |
| 1-329 | SAU013A | Outfall, 18"–36" | 1 | 38.85451 | -123.65140 |
| 1-330 | SAU011A | Outfall, 18"–36" | 1 | 38.85270 | -123.64853 |
| 1-331 | SAU008 | Outfall, Coupled | 1 | 38.85202 | -123.64821 |
| 1-334 | SAU009A | Outfall, 18"–36" | 1 | 38.85254 | -123.64809 |
| 1-335 | SAU006A | Outfall, 18"–36" | 1 | 38.85186 | -123.64777 |
| 1-337 | SAU016A | Outfall, 18"–36" | 1 | 38.85849 | -123.65237 |
| 1-338 | SAU012-ORW | Ocean Receiving Water | 1 | 38.85178 | -123.64892 |
| 1-340 | Greenwood Creek | Ocean Reference Area | 1 | 39.12578 | -123.71814 |

Table D.2. ASBS 8 Monitoring Sites

| Site ID | Site Name | Monitoring Type | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| 1-317 | RED014 | Outfall, 18"–36" | 1 | 41.63059 | -124.11296 |
| 1-318 | RED015 | Outfall, 18"–36" | 1 | 41.62928 | -124.11257 |
| 1-320 | RED017A | Outfall, 18"–36" | 1 | 41.61195 | -124.10571 |
| 1-321 | RED023 | Outfall, 18"–36" | 1 | 41.60527 | -124.10170 |
| 1-322 | RED028 | Outfall, Coupled | 1 | 41.59799 | -124.10066 |
| 1-323 | RED028-ORW | Ocean Receiving Water | 1 | 41.59732 | -124.10138 |
| 1-324 | RED027 | Outfall, 18"–36" | 1 | 41.59654 | -124.10127 |
| 1-336 | RED018A | Outfall, 18"–36" | 1 | 41.61300 | -124.10610 |
| 1-339 | Nickel Creek | Ocean Reference Area | 1 | 41.69986 | -124.14186 |

Table D.3. ASBS 9 Monitoring Sites

| Site ID | Site Name | Monitoring Type | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| 4-341 | FIT012 | Outfall, Coupled | 2 | 37.531406 | -122.51686 |
| 4-342 | FIT012-ORW | Ocean Receiving Water | 2 | 37.53096 | -122.51783 |

Table D.4. ASBS 15 Monitoring Sites

| Site ID | Site Name | Monitoring Type | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| 4-343 | ANO001 | Outfall, 18”–36” | 3 | 37.12167 | -122.30636 |
| 4-344 | ANO030 | Outfall, 18”–36” | 3 | 37.11415 | -122.30105 |
| 4-345 | ANO033 | Outfall, Coupled | 3 | 37.11292 | -122.29890 |
| 4-346 | ANO033-ORW | Ocean Receiving Water | 3 | 37.11183 | -122.29899 |
| 4-348 | ANO035 | Outfall, 18”–36” | 3 | 37.10787 | -122.29270 |
| 4-353 | ANO002 | Outfall, 18”–36” | 3 | 37.11987 | -122.30534 |

Table D.5. ASBS 34 Monitoring Sites

| Site ID | Site Name | Monitoring Type | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| 5-303 | CAR006 | Outfall, 18”–36” | 3 | 36.52463 | -121.92431 |
| 5-304 | CAR007B | Outfall, Coupled | 3 | 36.52499 | -121.92379 |
| 5-305 | CAR007B-ORW | Ocean Receiving Water | 3 | 36.52647 | -121.92525 |

Table D.6. ASBS 24 Monitoring Sites

| Site ID | Site Name | Monitoring Type | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| 7-343 | MUG005 | Outfall, >36” | 4 | 34.083896 | -119.038210 |
| 7-345 | MUG010 | Outfall, >36” | 4 | 34.070804 | -119.014826 |
| 7-346 | MUG013 | Outfall, 18”–36” | 4 | 34.065445 | -118.993551 |
| 7-347 | MUG016 | Outfall, <18” | 4 | 34.062852 | -118.987069 |
| 7-348 | MUG028 | Outfall, 18”–36” | 4 | 34.058928 | -118.974165 |
| 7-349 | MUG031 | Outfall, 18”–36” | 4 | 34.056265 | -118.968706 |
| 7-350 | MUG041 | Outfall, 18”–36” | 4 | 34.053461 | -118.964271 |
| 7-351 | MUG046 | Outfall, <18” | 4 | 34.052112 | -118.960862 |
| 7-352 | MUG048 | Outfall, <18” | 4 | 34.051645 | -118.959451 |
| 7-353 | MUG049 | Outfall, 18”–36” | 4 | 34.051650 | -118.95943 |
| 7-354 | MUG051 | Outfall, 18”–36” | 4 | 34.050937 | -118.957316 |
| 7-355 | MUG053 | Outfall, 18”–36” | 4 | 34.050248 | -118.955390 |
| 7-356 | MUG058 | Outfall, <18” | 4 | 34.048355 | -118.950420 |
| 7-357 | MUG059 | Outfall, 18”–36” | 4 | 34.048835 | -118.951500 |
| 7-358 | MUG061 | Outfall, <18” | 4 | 34.047675 | -118.948340 |
| 7-359 | MUG066 | Outfall, 18”–36” | 4 | 34.047140 | -118.924654 |
| 7-360 | MUG070 | Outfall, <18” | 4 | 34.045864 | -118.931970 |
| 7-361 | MUG073 | Outfall, <18” | 4 | 34.046418 | -118.922723 |
| 7-362 | MUG077 | Outfall, <18” | 4 | 34.045197 | -118.934452 |
| 7-363 | MUG078 | Outfall, <18” | 4 | 34.045431 | -118.934358 |
| 7-364 | MUG135 | Outfall, 18”–36” | 4 | 34.041983 | -118.897426 |
| 7-365 | MUG147 | Outfall, <18” | 4 | 34.041553 | -118.894154 |
| 7-366 | MUG150 | Outfall, <18” | 4 | 34.040872 | -118.889212 |
| 7-367 | MUG187 | Outfall, <18” | 4 | 34.039285 | -118.869505 |
| 7-368 | MUG283 | Outfall, Coupled | 4 | 34.025890 | -118.765915 |
| 7-369 | MUG283RW | Ocean Receiving Water | 4 | 34.024855 | -118.765760 |
| 7-370 | MUG346 | Outfall, <18” | 4 | 34.025080 | -118.783588 |
| 7-371 | MUG355 | Outfall, 18”–36” | 4 | 34.020820 | -118.829696 |
| 7-372 | SAD0950 | Outfall, 18”–36” | 4 | 34.026990 | -118.838550 |
| 7-373 | SAD0960 | Outfall, 18”–36” | 4 | 34.023020 | -118.837500 |
| 7-374 | SAD0970 | Outfall, 18”–36” | 4 | 34.025359 | -118.836458 |
| 7-375 | SAD0980 | Outfall, >36” | 4 | 34.024387 | -118.834798 |

| Site ID | Site Name | Monitoring Type | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| 7-376 | SAD0990 | Outfall, >36” | 4 | 34.023020 | -118.832672 |
| 7-377 | SAD1000 | Outfall, 18”–36” | 4 | 34.021265 | -118.830324 |
| 7-378 | SAD1040 | Outfall, 18”–36” | 4 | 34.017480 | -118.825660 |
| 7-379 | SAD1050 | Outfall, 18”–36” | 4 | 34.017000 | -118.824920 |
| 7-380 | SAD1060 | Outfall, >36” | 4 | 34.015590 | -118.822540 |
| 7-381 | SAD1030 | Outfall, 18”–36” | 4 | 34.018711 | -118.827049 |
| 7-383 | MUG318 | Outfall, 18”–36” | 4 | 34.023879 | -118.834316 |
| 7-384 | ALT004 | Outfall, 18”–36” | 4 | 34.086090 | -119.059097 |
| 7-385 | ALT005 | Outfall, <18” | 4 | 34.085415 | -119.054291 |
| 7-386 | ALT006 | Outfall, <18” | 4 | 34.085361 | -119.048653 |
| 7-388 | ALT008 | Outfall, <18” | 4 | 34.062325 | -118.985931 |
| 7-389 | ALT009 | Outfall, <18” | 4 | 34.059978 | -118.975975 |
| 7-390 | ALT010 | Outfall, <18” | 4 | 34.047873 | -118.948184 |
| 7-391 | ALT011 | Outfall, <18” | 4 | 34.045355 | -118.939404 |
| 7-393 | ALT017 | Outfall, 18”–36” | 4 | 34.025805 | -118.777059 |
| 7-400 | ALT018 | Outfall, <18” | 4 | 34.083392 | -119.035485 |

Table D.7. ASBS 33 Monitoring Sites

| Site ID | Site Name | Monitoring Type | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| 12-350 | IRV007 | Outfall, Coupled | 8 | 33.564500 | -117.828167 |
| 12-351 | IRV007-ORW | Ocean Receiving Water | 8 | 33.564153 | -117.828557 |
| 12-352 | IRV002 | Outfall, >36” | 8 | 33.560705 | -117.82148 |
| 12-353 | IRV009 | Outfall, >36” | 8 | 33.565300 | -117.831200 |
| 12-354 | IRV020 | Outfall, >36” | 8 | 33.574016 | -117.840233 |
| 12-358 | IRV001 | Outfall, 18”–36” | 8 | 33.558 | -117.81858 |

# APPENDIX E

## ASBS
## Cumulative Data Tables with Exceedances

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*to facilitate double-sided printing.*

# Appendix E
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*to facilitate double-sided printing.*

Table E.1. Comparison with Natural Water Quality Limits - ASBS 05, Kelp Beds at Saunders Reef

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2/26/2014 | | 2/5/2015 | | 4/6/2015 | | 12/18/2015 | | 1/28/2016 | | 2/17/2016 | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Total Orthophosphate as P | mg/L | 0.09 | 0.06 | 0.07 | 0.04 | 0.1 | 0.08 | 0.05 | 0.06 | 0.06 | 0.04 | 0.02 | 0.07 | 0.06 |
| Total Suspended Solids | mg/L | 50.82 | 7.8 | 18.4 | 12 | 47.7 | 34.2 | 11 | 13.2 | 18.5 | 23.3 | 8.2 | 19.5 | 14.1 |
| Oil & Grease | mg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Ammonia as N | mg/L | 0.042 | 0 | 0 | 0 | 0 | 0 | 0 | 0.06 | 0.05 | 0 | 0.02 | 0.06 | 0.05 |
| Nitrate as N | mg/L | 2.77 | 0.33 | 0.29 | 0.05 | 0.1 | 0.42 | 0.31 | 0.18 | 0.27 | 0.08 | 0.07 | 0.21 | 0.2 |
| Arsenic | µg/L | 1.76 | 1.486 | 1.732 | 1.443 | 1.298 | 2.149 | 1.527 | 1.534 | 1.362 | 1.738 | 0.26 | 1.685 | 1.817 |
| Cadmium | µg/L | 0.06 | 0.0592 | 0.0513 | 0.0205 | 0.0283 | 0.0875 | 0.0469 | 0.0329 | 0.0248 | 0.0257 | 0.009 | 0.0504 | 0.0454 |
| Chromium | µg/L | 4.86 | 0.4873 | 1.3377 | 0.5366 | 1.81 | 1.6211 | 0.814 | 0.8125 | 1.1012 | 1.2533 | 0.7276 | 1.3875 | 1.0525 |
| Copper | µg/L | 2.06 | 0.455 | 0.425 | 0.161 | 1.145 | 0.93 | 0.313 | 0.391 | 0.679 | 0.736 | 0.954 | 0.68 | 0.698 |
| Lead | µg/L | 0.55 | 0 | 0.1377 | 0.0136 | 0.4461 | 0.4701 | 0.1207 | 0.08 | 0.0828 | 0.2135 | 0.1836 | 0.1236 | 0.0953 |
| Mercury | µg/L | 0.006 | 0 | 0 | 0.0239 | 0.0106 | 0 | 0 | 0.0009 | 0.0015 | 0.00283 | 0.00648 | 0.00213 | 0.00192 |
| Nickel | µg/L | 4.61 | 0.4561 | 1.2748 | 0.4546 | 1.9138 | 1.6569 | 0.8196 | 0.8495 | 1.3074 | 1.5534 | 1.0805 | 1.7137 | 1.2882 |
| Selenium | µg/L | 0.03 | 0.015 | 0.032 | 0.018 | 0.034 | 0.041 | 0.028 | 0.02 | 0.031 | 0.034 | 0.03 | 0.037 | 0.036 |
| Silver | µg/L | 0.13 | 0.24 | 0.06 | 0.03 | 0.03 | 0.31 | 0.31 | 0.07 | 0.07 | 0.09 | 0.06 | 0.04 | 0.05 |
| Zinc | µg/L | 8.48 | 0.8851 | 1.7923 | 0.3336 | 5.4123 | 2.8918 | 1.4899 | 0.9907 | 1.4056 | 2.3531 | 9.5324 | 1.5839 | 2.2809 |
| Toxicity, Urchin | P/F | | 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 |
| Toxicity, Kelp - Growth | P/F | | P | P | P | P | P | P | P | P | P | P | P | P |
| Toxicity, Mussel | P/F | | P | F | P | P | P | P | P | P | P | P | P | P |
| Total OPs | ng/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total PAHs | ng/L | 47 | 3.5 | 2.8 | 2.6 | 9.1 | 2.9 | 1.8 | 39.7 | 4.5 | 0 | 0 | 7.4 | 7.8 |
| Total PPs | ng/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Abbreviations & Acronyms:

F = Fail

P = Pass

Notes:

1. During 2013-14 monitoring season 13 PAHs were analyzed as required by the Caltrans Permit. The SCCWRP Reference Water Quality Study used 25 PAHs and the SCCWRP report was released in February 2015. After the report was released Caltrans started analyzing for the 25 PAHs since the Natural Water Quality value was based on 25 PAHs. The first storm event, SE #1, captured during the 2013-14 monitoring season only analyzed for 13 PAHs.

2. The Sampling and Analysis Plan (SAP) was updated for the 2014-15 monitoring season and finalized in March 2015. The detection limit for mercury was lowered from 0.005 µg/L to 0.0002 µg/L. This change was because the method changed from EPA 1640 to EPA 1631e. For ASBS 05, the change in method did not take effect until the start of the 2015-16 monitoring season. The first three storm events, SE #1 through SE #3, used Method 1640 for the analysis of mercury. The remaining three storm events, SE #4 through SE #6, used Method 1631e for the analysis of mercury.

3. Cells shaded in green indicate a result that is greater than the Natural Water Quality value. However, cells shaded in green do not indicate an exceedance of Natural Water Quality in accordance with the ASBS compliance flow chart (Figure 2.1).

4. Rows shaded in yellow indicate a constituent that has exceeded a Natural Water Quality value.

5. Per the No. CA RMG, Non Detect values are set equal to 0.

6. The Natural Water Quality value for Total PAHs is based on the sum of the 13 PAHs listed in the California Ocean Plan. Even though Caltrans monitors for 25 PAHs, the sum provided in this table is for the 13 PAHs.

Table E.2. Comparison with Natural Water Quality Limits - ASBS 08, Redwood National Park

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2/14/2014 | | 3/20/2015 | | 3/21/2016 | | | | | | | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Total Orthophosphate as P | mg/L | 0.09 | 0.01 | 0.02 | 0.03 | 0.07 | 0.04 | 0.07 | | | | | | |
| Total Suspended Solids | mg/L | 50.82 | 25 | 39 | 13.1 | 60.6 | 10.6 | 44.8 | | | | | | |
| Oil & Grease | mg/L | 0 | 0 | 0 | 0 | 0 | 0 | 1.3 | | | | | | |
| Ammonia as N | mg/L | 0.042 | 0.03 | 0.06 | 0 | 0 | 0.02 | 0.11 | | | | | | |
| Nitrate as N | mg/L | 2.77 | 0.05 | 0.4 | 0.04 | 0.04 | 0.17 | 0.07 | | | | | | |
| Arsenic | µg/L | 1.76 | 1.365 | 1.456 | 1.403 | 1.562 | 1.572 | 1.814 | | | | | | |
| Cadmium | µg/L | 0.06 | 0.037 | 0.0377 | 0.0234 | 0.0246 | 0.0173 | 0.0227 | | | | | | |
| Chromium | µg/L | 4.86 | 2.3531 | 3.5081 | 1.1858 | 2.7215 | 1.1025 | 3.468 | | | | | | |
| Copper | µg/L | 2.06 | 1.037 | 2.104 | 0.964 | 1.546 | 0.815 | 2.313 | | | | | | |
| Lead | µg/L | 0.55 | 0.1424 | 0.5508 | 0.1881 | 0.2345 | 0.0736 | 0.2654 | | | | | | |
| Mercury | µg/L | 0.006 | 0 | 0 | 0.0066 | 0 | 0.00205 | 0.00472 | | | | | | |
| Nickel | µg/L | 4.61 | 3.1683 | 4.0769 | 2.1049 | 3.5974 | 2.3131 | 5.9296 | | | | | | |
| Selenium | µg/L | 0.03 | 0.027 | 0.025 | 0.021 | 0.022 | 0.008 | 0.023 | | | | | | |
| Silver | µg/L | 0.13 | 0.03 | 0.01 | 0.05 | 0.05 | 0.09 | 0.09 | | | | | | |
| Zinc | µg/L | 8.48 | 1.4019 | 4.5731 | 0.9768 | 2.3989 | 2.2686 | 2.7112 | | | | | | |
| Toxicity, Urchin | P/F | | P | P | NS | P | NS | P | | | | | | |
| Toxicity, Kelp - Germination | P/F | | P | P | NS | P | NS | P | | | | | | |
| Toxicity, Kelp - Growth | P/F | | P | P | NS | P | NS | P | | | | | | |
| Toxicity, Mussel | P/F | | P | P | NS | P | NS | P | | | | | | |
| Total OPs | ng/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Total PAHs | ng/L | 47 | 1.4 | 2.1 | 1.5 | 3.7 | 3.1 | 2.1 | | | | | | |
| Total PPs | ng/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |

Abbreviations & Acronyms:

F = Fail

P = Pass

NS = Not sampled

Notes:

1. During 2013-14 monitoring season 13 PAHs were analyzed as required by the Caltrans Permit. The SCCWRP Reference water Quality Study used 25 PAHs and the SCCWRP report was released in February 2015. After the report was released Caltrans started analyzing for the 25 PAHs since the Natural Water Quality value was based on 25 PAHs. The first storm event, SE #1, captured during the 2013-14 monitoring season only analyzed for 13 PAHs.

2. The Sampling and Analysis Plan (SAP) was updated for the 2014-15 monitoring season and finalized in March 2015. The detection limit for mercury was lowered from 0.005 µg/L to 0.0002 µg/L. This change was because the method changed from EPA 1640 to EPA 1631e. For ASBS 08, the change in method did not take effect until the start of the 2015-16 monitoring season. The first storm event, SE #1, used Method 1640 for the analysis of mercury. The remaining two storm events, SE #2 and SE #3, used Method 1631e for the analysis of mercury.

3. The pre-storm toxicity samples were not collected for the March 20, 2015 or March 21, 2016 storm event; therefore, there are no results to report.

4. Cells shaded in green indicate a result that is greater than the Natural Water Quality value. However, cells shaded in green do not indicate an exceedance of Natural Water Quality in accordance with the ASBS compliance flow chart (Figure 2.1).

5. Rows shaded in yellow indicate a constituent that has exceeded a Natural Water Quality value.

6. Per the No. CA RMG, Non Detect values are set equal to 0.

7. The Natural Water Quality value for Total PAHs is based on the sum of the 13 PAHs listed in the California Ocean Plan. Even though Caltrans monitors for 25 PAHs, the sum provided in this table is for the 13 PAHs.

Table E.3. Comparison with Natural Water Quality Limits - ASBS 09, James V. Fitzgerald Marine Reserve

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2/6/2014 | | 2/26/2014 | | 2/6/2015 | | 4/7/2015 | | 12/3/2015 | | 3/5/2016 | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Fecal Coliform | MPN/100mL | 1024 | 0 | 300 | 0 | 52 | 20 | 52 | NS | NS | NS | NS | NS | NS |
| Enterococcus | MPN/100mL | 477 | 0 | 1350 | 0 | 428 | 0 | 52 | NS | NS | NS | NS | NS | NS |
| Urea | mg/L | 0.01045 | 0 | 0 | 0 | 0.015 | 0.01 | 0.01 | 0 | 0 | 0 | 0 | 0.01 | 0.016 |
| Dissolved Orthophosphate as P | mg/L | 0.16 | 0.1 | 0.11 | 0.06 | 0 | 0.08 | 0.1 | 0.06 | 0.09 | 0.02 | 0.02 | 0.03 | 0.02 |
| Total Suspended Solids | mg/L | 560.3 | 5 | 9 | 11 | 40 | 11 | 52 | 24 | 39 | 6 | 15 | 8 | 16 |
| Oil & Grease | mg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ammonia as N | mg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.08 | 0 | 0 | 0 | 0 |
| Nitrate as N | mg/L | 1.15 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0.7 | 0.8 | 0.2 | 0.2 | 0.4 | 0.3 |
| Arsenic | µg/L | 4.95 | 1.267 | 1.082 | 1.497 | 2.126 | 1.48 | 1.879 | 1.684 | 1.047 | 1.41 | 1.51 | 1.445 | 1.524 |
| Cadmium | µg/L | 0.24 | 0.1037 | 0.0404 | 0.0795 | 0.0626 | 0.0366 | 0.0459 | 0.0853 | 0.0933 | 0.0252 | 0.0228 | 0.0451 | 0.0413 |
| Chromium | µg/L | 13.28 | 0.4997 | 0.8204 | 0.8962 | 5.6589 | 0.6731 | 2.0722 | 0.7811 | 1.0118 | 0.6732 | 1.0717 | 0.7916 | 0.8277 |
| Copper | µg/L | 11.81 | 0.524 | 3.116 | 1.511 | 5.706 | 0.307 | 1.367 | 0.314 | 6.204 | 0.366 | 0.822 | 1.817 | 0.938 |
| Lead | µg/L | 3.02 | 0.018 | 0.254 | 0.186 | 0.9387 | 0.0764 | 0.3335 | 0.1205 | 0.3937 | 0.0782 | 0.1633 | 0.1783 | 0.1221 |
| Mercury | µg/L | 0.0259 | 0 | 0 | 0 | 0 | 0.000511 | 0.00186 | 0.00103 | 0.00687 | 0.000493 | 0.00165 | 0.00101 | 0.00141 |
| Nickel | µg/L | 26.89 | 0.57 | 0.8738 | 0.9672 | 2.3616 | 0.8498 | 2.3131 | 0.9279 | 1.4492 | 0.7519 | 0.9899 | 0.8128 | 0.8976 |
| Selenium | µg/L | 0.34 | 0.017 | 0.014 | 0.015 | 0.032 | 0.012 | 0.036 | 0.035 | 0.028 | 0.016 | 0.02 | 0.014 | 0.028 |
| Silver | µg/L | 0.37 | 0 | 0 | 0.25 | 0.22 | 0.05 | 0.05 | 0.28 | 0.21 | 0.08 | 0.08 | 0.05 | 0.04 |
| Zinc | µg/L | 31.76 | 1.664 | 5.031 | 1.626 | 8.2874 | 0.5671 | 3.5249 | 1.4209 | 13.1183 | 0.8059 | 2.5109 | 1.6071 | 0.8717 |
| Toxicity, Urchin | P/F | | P | P | P | F | 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 |
| Toxicity, Kelp - Growth | P/F | | P | P | P | P | P | P | P | P | P | F | F | F |
| Toxicity, Mussel[8] | P/F | | P | P | P | F | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| Toxicity, Mussel - Normal Devel.[8] | P/F | | - - - | - - - | - - - | - - - | P | P | P | P | P | P | F | P |
| Toxicity, Mussel - Survival[8] | P/F | | - - - | - - - | - - - | - - - | P | P | P | P | P | P | P | P |

Table E.3. Comparison with Natural Water Quality Limits - ASBS 09, James V. Fitzgerald Marine Reserve

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2/6/2014 | | 2/26/2014 | | 2/6/2015 | | 4/7/2015 | | 12/3/2015 | | 3/5/2016 | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Total OPs | ng/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total PAHs | ng/L | 3.8 | 0 | 0 | 5.55 | 0 | 13.22 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| Total PPs | ng/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Abbreviations & Acronyms:

F = Fail

P = Pass

NS = Not sampled

Notes:

1. During 2013-14 monitoring season 13 PAHs were analyzed as required by the Caltrans Permit. The SCCWRP Reference Water Quality Study used 25 PAHs and the SCCWRP report was released in February 2015. After the report was released Caltrans started analyzing for the 25 PAHs since the Natural Water Quality value was based on 25 PAHs. The first two storm events, SE #1 and SE #2, captured during the 2013-14 monitoring season only analyzed for 13 PAHs.
2. The Sampling and Analysis Plan (SAP) was updated for the 2014-15 monitoring season and finalized in March 2015. The detection limit for mercury was lowered from 0.01 µg/L to 0.0002 µg/L. This change was because the method changed from EPA 1640 to EPA 1631e. Even though the Caltrans SAP method changed, the laboratory performing the analysis had always used Method 1631e for mercury. All storm events captured use the lower detection limit for mercury, i.e., mercury was analyzed by Method 1631e.
3. Per the Central Coast RMG, Non Detect values are set equal to 0.
4. ASBS 09 lies outside the range of the Southern Sea Otter. Bacteria samples were inadvertently collected the first 3 storm events, SE #1 through SE #3.
5. The Central Coast RMG dischargers plan to use alternative methods for assessing compliance with the ASBS Special Protections. During the 2016-17 monitoring season, Caltrans will work with the other dischargers to identify a consistent approach for assessing compliance.
6. The Natural Water Quality value for Total PAHs is based on the sum of the 13 PAHs listed in the California Ocean Plan. Even though Caltrans monitors for 25 PAHs, the sum provided in this table is for the 13 PAHs.
7. Cells shaded in green indicate a result that is greater than the Natural Water Quality value. However, cells shaded in green do not indicate an exceedance of Natural Water Quality in accordance with the ASBS compliance flow chart (Figure 2.1).
8. The toxicity laboratory initially reported a single Pass/Fail value for Mussel toxicity, and then switch to reporting Pass/Fail values for Normal Development and Survival.

Table E.4. Comparison with Natural Water Quality Limits - ASBS 15, Ano Nuevo Point and Island

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2/5/2014 | | 12/11/2014 | | 2/6/2015 | | 1/3/2016 | | 3/5/2016 | | | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Fecal Coliform | MPN/100mL | 1024 | R | R | 10 | 100 | 0 | 512 | 0 | 405 | 0 | 240 | | |
| Enterococcus | MPN/100mL | 477 | 20 | 41 | 20 | 30760 | 0 | 4549 | - - - | 521 | 0 | 7701 | | |
| Urea | mg/L | 0.01045 | 0 | 0 | 0 | 0 | 0.01 | 0.04 | 0 | 0.022 | 0.014 | 0.011 | | |
| Dissolved Orthophosphate as P | mg/L | 0.16 | 0.15 | 0.07 | 0.06 | 0 | 0.04 | 0.04 | 0.03 | 0.03 | 0.05 | 0.07 | | |
| Total Suspended Solids | mg/L | 560.3 | 21 | 12 | 41 | 104 | 9 | 287 | 19 | 301 | 44 | 27 | | |
| Oil & Grease | mg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ammonia as N | mg/L | 0 | 0 | 0 | 0.18 | 0.17 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nitrate as N | mg/L | 1.15 | 0 | 0 | 0.1 | 1.4 | 0 | 0.3 | 0.4 | 1.9 | 0.4 | 1.2 | | |
| Arsenic | µg/L | 4.95 | 1.43 | 1.393 | 1.895 | 2.927 | 1.533 | 2.002 | 1.496 | 4.659 | 1.725 | 1.982 | | |
| Cadmium | µg/L | 0.24 | 0.0448 | 0.0372 | 0.0609 | 0.477 | 0.0261 | 0.0802 | 0.047 | 0.5007 | 0.0471 | 0.0645 | | |
| Chromium | µg/L | 13.28 | 0.5784 | 0.7024 | 4.2347 | 8.4077 | 0.7331 | 4.9468 | 0.8781 | 15.661 | 1.9124 | 2.0574 | | |
| Copper | µg/L | 11.81 | 0.244 | 0.269 | 1.371 | 5.604 | 0.246 | 2.292 | 0.517 | 11.678 | 0.646 | 1.351 | | |
| Lead | µg/L | 3.02 | 0 | 0.0344 | 0.3122 | 2.2277 | 0.0422 | 0.7145 | 0.0965 | 3.6845 | 0.1649 | 0.3303 | | |
| Mercury | µg/L | 0.0259 | 0 | 0 | 0.00271 | 0.0119 | 0.00049 | 0.00589 | 0.000863 | 0.0129 | 0.00217 | 0.00376 | | |
| Nickel | µg/L | 26.89 | 0.6543 | 0.864 | 4.3354 | 12.2134 | 0.6893 | 3.818 | 0.8327 | 24.5697 | 1.6814 | 2.0114 | | |
| Selenium | µg/L | 0.34 | 0.02 | 0.015 | 0.033 | 0.133 | 0.017 | 0.046 | 0.028 | 1.814 | 0.047 | 0.031 | | |
| Silver | µg/L | 0.37 | 0 | 0.03 | 0.15 | 0.15 | 0.06 | 0.05 | 0.07 | 0.12 | 0.05 | 0.05 | | |
| Zinc | µg/L | 31.76 | 0.8004 | 0.6004 | 6.379 | 17.059 | 0.6104 | 7.0301 | 0.8244 | 33.5847 | 1.4353 | 3.9703 | | |
| Toxicity, Urchin | P/F | | 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 | | |
| Toxicity, Kelp - Growth | P/F | | P | P | P | P | P | P | P | P | P | P | | |
| Toxicity, Mussel[8] | P/F | | P | P | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | | |
| Toxicity, Mussel - Normal Devel.[8] | P/F | | - - - | - - - | P | P | P | P | P | P | P | P | | |
| Toxicity, Mussel - Survival[8] | P/F | | - - - | - - - | P | P | P | F | P | P | P | P | | |

Table E.4. Comparison with Natural Water Quality Limits - ASBS 15, Ano Nuevo Point and Island

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2/5/2014 | | 12/11/2014 | | 2/6/2015 | | 1/3/2016 | | 3/5/2016 | | | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Total OPs | ng/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Total PAHs | ng/L | 3.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Total PPs | ng/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |

Abbreviations & Acronyms:

F = Fail

P = Pass

R = Data rejected

Notes:

1. During 2013-14 monitoring season 13 PAHs were analyzed as required by the Caltrans Permit. The SCCWRP Reference Water Quality Study used 25 PAHs and the SCCWRP report was released in February 2015. After the report was released Caltrans started analyzing for the 25 PAHs since the Natural Water Quality value was based on 25 PAHs. The first storm event, SE #1, captured during the 2013-14 monitoring season only analyzed for 13 PAHs.
2. The Sampling and Analysis Plan (SAP) was updated for the 2014-15 monitoring season and finalized in March 2015. The detection limit for mercury was lowered from 0.01 µg/L to 0.0002 µg/L. This change was because the method changed from EPA 1640 to EPA 1631e. Even though the Caltrans SAP method changed, the laboratory performing the analysis had always used Method 1631e for mercury. All storm events captured use the lower detection limit for mercury, i.e., mercury was analyzed by Method 1631e.
3. Per the Central Coast RMG, Non Detect values are set equal to 0.
4. The Central Coast RMG dischargers plan to use alternative methods for assessing compliance with the ASBS Special Protections. During the 2016-17 monitoring season, Caltrans will work with the other dischargers to identify a consistent approach for assessing compliance.
5. The laboratory lost the sample for the January 3, 2016 storm event, SE #3; therefore, there is no data to report.
6. The Natural Water Quality value for Total PAHs is based on the sum of the 13 PAHs listed in the California Ocean Plan. Even though Caltrans monitors for 25 PAHs, the sum provided in this table is for the 13 PAHs.
7. Cells shaded in green indicate a result that is greater than the Natural Water Quality value. However, cells shaded in green do not indicate an exceedance of Natural Water Quality in accordance with the ASBS compliance flow chart (Figure 2.1).
8. The toxicity laboratory initially reported a single Pass/Fail value for Mussel toxicity, and then switch to reporting Pass/Fail values for Normal Development and Survival.

Table E.5. Comparison with Natural Water Quality Limits - ASBS 34, Carmel Bay

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 12/11/2014 | | 1/3/2016 | | 3/5/2016 | | 3/11/2016 | | | | | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Fecal Coliform | MPN/100mL | TBD | 0 | 100 | 0 | 50 | 7 | 14 | 0 | 130 | | | | |
| Enterococcus | MPN/100mL | TBD | 0 | 413 | - - - | 119 | 0 | 161 | 0 | 86 | | | | |
| Urea | mg/L | TBD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Dissolved Orthophosphate as P | mg/L | TBD | 0 | 0.16 | 0.02 | 0.06 | 0.03 | 0.04 | 0.03 | 0.07 | | | | |
| Total Suspended Solids | mg/L | TBD | 4 | 48 | 1 | 15 | 2 | 4 | 4 | 13 | | | | |
| Oil & Grease | mg/L | TBD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ammonia as N | mg/L | TBD | 0.28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nitrate as N | mg/L | TBD | 0.1 | 1.4 | 0.3 | 0.3 | 0.4 | 0.3 | 0.4 | 0.4 | | | | |
| Arsenic | µg/L | TBD | 1.525 | 1.097 | 1.576 | 0.853 | 1.516 | 1.368 | 1.855 | 0.606 | | | | |
| Cadmium | µg/L | TBD | 0.0228 | 0.6066 | 0.0185 | 0.1047 | 0.032 | 0.0292 | 0.0558 | 0.1412 | | | | |
| Chromium | µg/L | TBD | 0.2582 | 1.5982 | 0.1765 | 0.852 | 0.2053 | 0.2573 | 0.1594 | 0.4414 | | | | |
| Copper | µg/L | TBD | 0.148 | 2.073 | 0.104 | 0.902 | 0.123 | 0.216 | 0.192 | 0.736 | | | | |
| Lead | µg/L | TBD | 0 | 0.8902 | 0.065 | 0.4248 | 0.0105 | 0.0679 | 0.0487 | 0.2601 | | | | |
| Mercury | µg/L | TBD | 0.000293 | 0.00885 | 0.000258 | 0.00853 | 0 | 0.00173 | 0.000886 | 0.00481 | | | | |
| Nickel | µg/L | TBD | 0.2426 | 2.9799 | 0.1976 | 1.28 | 0.2284 | 0.3135 | 0.3731 | 1.0924 | | | | |
| Selenium | µg/L | TBD | 0.016 | 0.68 | 0.013 | 0.347 | 0.019 | 0.015 | 0.015 | 0.044 | | | | |
| Silver | µg/L | TBD | 0.21 | 0.02 | 0.08 | 0 | 0.05 | 0.05 | 0.09 | 0.08 | | | | |
| Zinc | µg/L | TBD | 0.4003 | 11.2771 | 0 | 6.0746 | 0.2058 | 0.6086 | 1.9792 | 4.435 | | | | |
| Toxicity, Urchin | P/F | | P | P | P | P | P | P | P | P | | | | |
| Toxicity, Kelp - Germination | P/F | | P | P | P | P | P | P | P | P | | | | |
| Toxicity, Kelp - Growth | P/F | | P | P | P | P | P | P | P | P | | | | |
| Toxicity, Mussel - Normal Devel. | P/F | | P | P | P | P | P | P | P | P | | | | |
| Toxicity, Mussel - Survival | P/F | | P | P | P | P | P | P | P | P | | | | |
| Total OPs | ng/L | TBD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

Table E.5. Comparison with Natural Water Quality Limits - ASBS 34, Carmel Bay

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 12/11/2014 | | 1/3/2016 | | 3/5/2016 | | 3/11/2016 | | | | | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Total PAHs | ng/L | TBD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Total PPs | ng/L | TBD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

Abbreviations & Acronyms:

F = Fail

P = Pass

Notes:

1. During 2013-14 monitoring season 13 PAHs were analyzed as required by the Caltrans Permit. The SCCWRP Reference water Quality Study used 25 PAHs and the SCCWRP report was released in February 2015. After the report was released Caltrans started analyzing for the 25 PAHs since the Natural Water Quality value was based on 25 PAHs. No storm events were captured during the 2013-14 monitoring season; therefore, all captured storm events were analyzed for 25 PAHs.

2. The Sampling and Analysis Plan (SAP) was updated for the 2014-15 monitoring season and finalized in March 2015. The detection limit for mercury was lowered from 0.01 µg/L to 0.0002 µg/L. This change was because the method changed from EPA 1640 to EPA 1631e. Even though the Caltrans SAP method changed, the laboratory performing the analysis had always used Method 1631e for mercury. All storm events captured use the lower detection limit for mercury, i.e., mercury was analyzed by Method 1631e.

3. Per the Central Coast RMG, Non Detect values are set equal to 0.

4. The Central Coast RMG dischargers plan to use alternative methods for assessing compliance with the ASBS Special Protections. During the 2016-17 monitoring season, Caltrans will work with the other dischargers to identify a consistent approach for assessing compliance.

5. The laboratory lost the sample for the January 3, 2016 storm event, SE #2; therefore, there is no data to report.

6. The Central Coast RMG area is divided into two sub-regions: northern and southern. ASBS 34 lies in the southern sub-region. Some Central Coast RMG dischargers will be discussing with the State Water Board that the northern sub-region NWQ values should be applied to all dischargers not only those dischargers located in the northern sub-region.

7. The Natural Water Quality value for Total PAHs will be based on the sum of the 13 PAHs listed in the California Ocean Plan. Even though Caltrans monitors for 25 PAHs, the sum provided in this table is for the 13 PAHs.

Table E.6. Comparison with Natural Water Quality Limits - ASBS 24, Mugu Lagoon to Latigo Point

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2/26/2014 | | | | | | | | | | | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Total Orthophosphate as P | mg/L | 0.1 | 0.03 | 0.11 | | | | | | | | | | |
| Total Suspended Solids | mg/L | 48 | 14.5 | 134 | | | | | | | | | | |
| Oil & Grease | mg/L | 0.5 | 0.5 | 0.5 | | | | | | | | | | |
| Ammonia as N | mg/L | 0.015 | 0.01 | 0.01 | | | | | | | | | | |
| Nitrate as N | mg/L | 0.34 | 0.03 | 0.01 | | | | | | | | | | |
| Arsenic | µg/L | 1.8 | 1.422 | 1.904 | | | | | | | | | | |
| Cadmium | µg/L | 0.15 | 0.1053 | 0.1473 | | | | | | | | | | |
| Chromium | µg/L | 1.9 | 1.2754 | 1.6479 | | | | | | | | | | |
| Copper | µg/L | 1.5 | 0.519 | 1.31 | | | | | | | | | | |
| Lead | µg/L | 0.5 | 0.1691 | 0.6973 | | | | | | | | | | |
| Mercury | µg/L | 0.0006 | 0.0006 | 0.0006 | | | | | | | | | | |
| Nickel | µg/L | 1.3 | 0.8569 | 1.9577 | | | | | | | | | | |
| Selenium | µg/L | 0.003 | 0.042 | 0.085 | | | | | | | | | | |
| Silver | µg/L | 0.08 | 0.07 | 0.08 | | | | | | | | | | |
| Zinc | µg/L | 18.6 | 1.7841 | 7.5549 | | | | | | | | | | |
| Toxicity, Urchin | P/F | | P | P | | | | | | | | | | |
| Toxicity, Kelp - Germination | P/F | | P | P | | | | | | | | | | |
| Toxicity, Kelp - Growth | P/F | | P | P | | | | | | | | | | |
| Toxicity, Mussel | P/F | | P | P | | | | | | | | | | |
| Total OPs | ng/L | 0.5 | 0.5 | 0.5 | | | | | | | | | | |
| Total PAHs | ng/L | 12.5 | 11.6 | 10.9 | | | | | | | | | | |
| Total PPs | ng/L | 7 | 7 | 7 | | | | | | | | | | |

Abbreviations & Acronyms:

F = Fail

P = Pass

Notes:

1. During 2013-14 monitoring season 13 PAHs were analyzed as required by the Caltrans Permit. The SCCWRP Reference Water Quality Study used 25 PAHs and the SCCWRP report was released in February 2015. After the report was released Caltrans started analyzing for the 25 PAHs since the Natural Water Quality value was based on 25 PAHs. The first storm event, SE #1, captured during the 2013-14 monitoring season only analyzed for 13 PAHs.
2. The Sampling and Analysis Plan (SAP) was updated for the 2014-15 monitoring season and finalized in March 2015. The detection limit for mercury was lowered from 0.005 µg/L to 0.0002 µg/L. This change was because the method changed from EPA 1640 to EPA 1631e. The first storm event, SE #1, used Method 1640 for the analysis of mercury. The remaining storm events, will use Method 1631e for the analysis of mercury.
3. Cells shaded in green indicate a result that is greater than the Natural Water Quality value. However, cells shaded in green do not indicate an exceedance of Natural Water Quality in accordance with the ASBS compliance flow chart (Figure 2.1).
4. Rows shaded in yellow indicate a constituent that has exceeded a Natural Water Quality value.
5. Per the So. CA RMG, Non Detect values are set equal to 1/2 the Method Detection Limit (MDL).

Table E.7. Comparison with Natural Water Quality Limits - ASBS 33, Irvine Coast Marine Life Refuge

| | | | SE #1 | | SE #2 | | SE #3 | | SE #4 | | SE #5 | | SE #6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2/18/2013 | | 3/6/2013 | | 2/27/2014 | | 10/31/2014 | | 12/2/2014 | | 12/12/2014 | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post | Pre | Post |
| Total Orthophosphate as P | mg/L | 0.1 | 0.02 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.08 | 0.03 | 0.03 | 0.03 | 0.03 |
| Total Suspended Solids | mg/L | 48 | 18 | 11.3 | 7.2 | 10.3 | 22 | 4.4 | 4.7 | 15.7 | 4.6 | 6.4 | 3.2 | 13.8 |
| Oil & Grease | mg/L | 0.5 | 1 | 0.5 | 0.5 | 7.3 | 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 | 0.04 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 | 0.03 | 0.01 | 0.01 | 0.01 |
| Nitrate as N | mg/L | 0.34 | 0.3 | 0.31 | 0.15 | 0.12 | 0.03 | 0.03 | 0.02 | 0.13 | 0.02 | 0.03 | 0.01 | 0.02 |
| Arsenic | µg/L | 1.8 | 1.48 | 1.549 | 1.4 | 1.435 | 1.349 | 1.648 | 1.35 | 1.621 | 1.393 | 1.566 | 1.517 | 1.648 |
| Cadmium | µg/L | 0.15 | 0.044 | 0.0409 | 0.14 | 0.1371 | 0.0622 | 0.0968 | 0.018 | 0.5441 | 0.0113 | 0.1077 | 0.051 | 0.1045 |
| Chromium | µg/L | 1.9 | 0.3 | 0.2799 | 0.69 | 0.589 | 0.5078 | 0.9756 | 0.2382 | 1.4911 | 0.1415 | 0.5613 | 0.3385 | 1.2709 |
| Copper | µg/L | 1.5 | 0.23 | 0.385 | 0.41 | 0.648 | 0.247 | 0.561 | 0.506 | 1.061 | 0.553 | 0.377 | 0.232 | 2.304 |
| Lead | µg/L | 0.5 | 0.052 | 0.1043 | 0.46 | 0.1165 | 0.1127 | 0.3218 | 0.0391 | 0.1481 | 0.023 | 0.1715 | 0.0741 | 0.37 |
| Mercury | µg/L | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 |
| Nickel | µg/L | 1.3 | 0.33 | 0.3596 | 0.62 | 0.843 | 0.4045 | 0.8299 | 0.2723 | 3.8244 | 0.1777 | 0.6794 | 0.3303 | 1.2345 |
| Selenium | µg/L | 0.003 | 0.022 | 0.01 | 0.018 | 0.031 | 0.018 | 0.028 | 0.013 | 0.222 | 0.0025 | 0.019 | 0.011 | 0.035 |
| Silver | µg/L | 0.08 | 0.005 | 0.005 | 0.01 | 0.005 | 0.13 | 0.01 | 0.08 | 0.05 | 0.07 | 0.06 | 0.08 | 0.09 |
| Zinc | µg/L | 18.6 | 2.86 | 3.5577 | 25.5 | 30.471 | 1.4477 | 2.2298 | 0.5231 | 4.9648 | 0.2875 | 1.8278 | 0.9003 | 3.4486 |
| Toxicity, Urchin | P/F | | 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 |
| Toxicity, Kelp - Growth | P/F | | P | P | P | P | P | F | P | P | P | F | P | P |
| Toxicity, Mussel | P/F | | P | P | P | P | P | P | P | P | P | P | P | P |
| Total OPs | ng/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 |
| Total PAHs | ng/L | 12.5 | 6.5 | 6.5 | 6.5 | 6.5 | 7.3 | 6.5 | 6.5 | 6.5 | 8 | 6.5 | 6.5 | 7.5 |
| Total PPs | ng/L | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

| | | | SE #7 | | SE #8 | | SE #9 | |
|---|---|---|---|---|---|---|---|---|
| | | | 1/5/2016 | | 2/17/2016 | | 3/6/2016 | |
| Constituent | Units | NWQ | Pre | Post | Pre | Post | Pre | Post |
| Total Orthophosphate as P | mg/L | 0.1 | 0.02 | 0.06 | 0.02 | 0.02 | 0.02 | 0.22 |
| Total Suspended Solids | mg/L | 48 | 5.1 | 165.6 | 2.8 | 3.8 | 3.1 | 91.1 |
| Oil & Grease | mg/L | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Ammonia as N | mg/L | 0.015 | 0.04 | 0.05 | 0.01 | 0.01 | 0.01 | 0.01 |
| Nitrate as N | mg/L | 0.34 | 0.005 | 0.06 | 0.005 | 0.005 | 0.005 | 0.05 |
| Arsenic | µg/L | 1.8 | 1.505 | 3.318 | 1.491 | 1.537 | 1.452 | 2.417 |
| Cadmium | µg/L | 0.15 | 0.0465 | 7.2197 | 0.0648 | 0.0632 | 0.0557 | 0.7831 |
| Chromium | µg/L | 1.9 | 0.2856 | 6.1695 | 0.3014 | 0.2266 | 0.282 | 5.5058 |
| Copper | µg/L | 1.5 | 0.217 | 4.401 | 0.292 | 0.276 | 2.27 | 3.99 |
| Lead | µg/L | 0.5 | 0.0512 | 1.3711 | 0.0548 | 0.0455 | 0.1777 | 1.16 |
| Mercury | µg/L | 0.0006 | 0.0018 | 0.0109 | 0.00089 | 0.00061 | 0.00002 | 0.00885 |
| Nickel | µg/L | 1.3 | 0.3968 | 27.6453 | 0.4187 | 0.3604 | 0.4034 | 5.6835 |
| Selenium | µg/L | 0.003 | 0.024 | 0.667 | 0.011 | 0.015 | 0.02 | 0.076 |
| Silver | µg/L | 0.08 | 0.06 | 0.06 | 0.1 | 0.11 | 0.05 | 0.06 |
| Zinc | µg/L | 18.6 | 0.0815 | 31.1309 | 0.6542 | 0.4392 | 1.7026 | 14.5928 |
| Toxicity, Urchin | P/F | | P | P | P | P | P | P |
| Toxicity, Kelp - Germination | P/F | | P | P | P | P | P | P |
| Toxicity, Kelp - Growth | P/F | | P | P | P | P | P | P |
| Toxicity, Mussel | P/F | | P | P | P | P | P | P |
| Total OPs | ng/L | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Total PAHs | ng/L | 12.5 | 14.6 | 21.4 | 23.8 | 19.8 | 12.5 | 29.3 |
| Total PPs | ng/L | 7 | 7 | 7 | 7 | 7 | 7 | 7 |

Abbreviations & Acronyms:

F = Fail

P = Pass

Notes:

1. During 2013-14 monitoring season 13 PAHs were analyzed as required by the Caltrans Permit. The SCCWRP Reference Water Quality Study used 25 PAHs and the SCCWRP report was released in February 2015. After the report was released Caltrans started analyzing for the 25 PAHs since the Natural Water Quality value was based on 25 PAHs. The first six storm events, SE #1 through #6, captured only analyzed for 13 PAHs.
2. The Sampling and Analysis Plan (SAP) was updated for the 2014-15 monitoring season and finalized in March 2015. The detection limit for mercury was lowered from 0.005 µg/L to 0.0002 µg/L. This change was because the method changed from EPA 1640 to EPA 1631e. For ASBS 33, the change in method did not take effect until the start of the 2015-16 monitoring season. The first six storm events, SE #1 through SE #6, used Method 1640 for the analysis of mercury. The remaining three storm events, SE #7 through SE #9, used Method 1631e for the analysis of mercury.
3. Cells shaded in green indicate a result that is greater than the Natural Water Quality value. However, cells shaded in green do not indicate an exceedance of Natural Water Quality in accordance with the ASBS compliance flow chart (Figure 2.1).
4. Rows shaded in yellow indicate a constituent that has exceeded a Natural Water Quality value.
5. Per the So. CA RMG, Non Detect values are set equal to 1/2 the Method Detection Limit (MDL).

# APPENDIX F

## TMDL
## List of Actively Monitored Sites

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# Appendix F
# List of Tables


| Table | Title |
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| F.1 | District 8 Coachella Valley TMDL Monitoring Sites |
| F.2 | District 11 Chollas Creek Monitoring Sites |
| F.3 | District 11 Rainbow Creek TMDL Monitoring Sites |
| F.4 | NPDES Permit TMDL Monitoring Sites |

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Tables F.1 through F.4 list the actively monitored sites for the TMDL Monitoring Program for the 2015–16 season. Information in these tables includes site identification number, site name, Regional Water Board region number, and the latitude and longitude for each site.

Table F.1. District 8 Coachella Valley TMDL Monitoring Project Sites

| Site ID | Station ID | Description | Regional Water Board | Latitude (North) | Longitude (West) |
|---|---|---|---|---|---|
| #4 | 8-310 | I-10/SR 86 Interchange | 7 | 33° 42’59.12” | 116° 11’25.98” |
| #5 | 8-311 | SR 66/Dillon Rd. Interchange | 7 | 33° 42’27.86” | 116° 10’56.72” |

Table F.2. District 11 Chollas Creek TMDL Monitoring Sites

| Site ID | Site Name | Description | Regional Water Board | Latitude | Longitude |
|---|---|---|---|---|---|
| 11-341 | 28th Street Effluent | Vegetated Bioswale | 9 | 32.713834 | -117.133575 |
| 11-344 | I-15S/SR94-EFF | Effluent from BMP[1] | 9 | 32.71552 | -117.11809 |
| 11-346 | I-15S/Market-EFF | Effluent from BMP[1] | 9 | 32.71137 | -117.11992 |

Notes:

1. Modular Infiltration Trench.

Table F.3. District 11 Rainbow Creek TMDL Monitoring Site

| Site ID | Site Name | Description | Regional Water Board | Latitude | Longitude |
|---|---|---|---|---|---|
| 11-332 | Caltrans I-15 Runoff | Discharge Location | 9 | 33.4120 | -117.1609 |

Table F.4. NPDES Permit TMDL Monitoring Sites

| Site ID | Site Name | Description | Regional Water Board | Latitude | Longitude |
|---|---|---|---|---|---|
| 3-397 | I-5 SB @ Consumnes | Discharge Location | 5S | 38.4732 | -121.502 |
| 4-324 | I-80/880/580 Interchange, Basin 5 | Effluent of a Bioretention BMP | 2 | 37.828083 | -122.293301 |
| 4-349 | Carquinez Bridge, South | Discharge Location | 2 | 38° 3'12.70" N | 122° 13'34.15" W |
| 4-350 | I-680/24 Interchange | Discharge Location | 2 | 37° 53'48.28" N | 122° 4'19.84" W |
| 4-351 | I-580/80 Interchange | Discharge Location | 2 | 37° 53'29.14" N | 122° 18'28.03" W |
| 7-09 | North Hollywood CSF Outlet | Effluent of a Compost Storm Filter BMP | 4 | 34.1486 | -118.3729 |
| 7-201 | UCLA-1 | Effluent of a GSRD BMP | 4 | 34.1654 | -118.4813 |
| 7-336 | SMB-MC | Discharge Location | 4 | 34.03488 | -118.68132 |
| 10-300 | 209-6T | Discharge Location | 5 | 37.73815 | -121.34387 |
| 12-330 | 1149L Outlet | Effluent of a Bioretention BMP | 8 | 33.639949 | -117.861427 |
| 12-336 | 1194 Outlet, D12 SR 73 BMP Pilot Program | Effluent of an Austin Sand Filter BMP | 8 | 33.652559 | -117.861315 |
| 12-356 | 1180R | Effluent of a Detention Basin BMP | 8 | 33.649673 | -117.8603 |

# APPENDIX G

## Monitoring Under Cooperative Agreements

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# APPENDIX H

## Water Quality Data for the 2015–16 Season

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# APPENDIX I

## Water Quality Reference Values

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# Appendix I
# List of Tables


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| I.1 | Reference Values for Site IDs 11-341, 11-344, 11-346 |
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| I.9 | Reference Values for Site ID 7-336 |
| I.10 | Reference Values for Site IDs 12-330, 12-336, 12-356 |

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**Table I.1**

Reference Values for Site IDs 11-341, 11-344, 11-346

| Constituent | Units | California Toxics Rule [1] Freshwater Acute | Region 9 Basin Plan General Objectives | Region 9 Basin Plan Acute | Region 9 Basin Plan TMDL | Most Stringent Value [1] CTR | Most Stringent Value [1] Basin Plan | Most Stringent Value [1] TMDL |
|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | |
| Copper | µg/L | 12 [b,c,d] | | 12 [a] | 11 [a] | 12 | 12 | 11 |
| Diazinon | µg/L | | | 0.072 | 0.072 | | 0.072 | 0.072 |
| Lead | µg/L | 58 [a,c,d] | | 58 [a] | 52 [a] | 58 | 58 | 52 |
| Zinc | µg/L | 108 [b,c,d] | | 108 [a] | 97 [a] | 108 | 108 | 97 |
| *Field Measurements* | | | | | | | | |
| pH | pH | | 6.5 to 8.5 | | | | 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] | | | | 1605 | | |
| Copper (Total) | µg/L | 13 [b,c] | | 13 [a] | | 13 | | |
| Lead (Total) | µg/L | 72 [a,c] | | 72 [a] | | 72 | | |
| Zinc (Total) | µg/L | 110 [b,c] | | 110 [a] | | 110 | | |

Sources: USEPA 2000; USEPA 2001; SDRWQCB 2011

Notes: L = liter, µg/L = micrograms per liter, mg/L = milligrams per liter

Beneficial Uses: REC-2, WARM, WILD

**Most Stringent Value**

1 Value selected is most stringent acute value from each category.

**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 ($CaCO_3$) 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 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 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.

**Region 9 TMDL**

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. The TMDLs for dissolved copper, lead. and zinc in Chollas Creek are concentration-based and set equal to 90 percent of the numeric target loading capacity.

**Table I.2**

Reference Values for Site ID 11-332

| Constituent | Units | California Toxics Rule [1] Freshwater Accute | California Toxics Rule [1] Freshwater Chronic | Region 9 Basin Plan General Objectives | Region 9 Basin Plan TMDL | California Drinking Water MCLs [1] | Most Stringent Value [1] CTR | Most Stringent Value [1] Basin Plan | Most Stringent Value [1] TMDL |
|---|---|---|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | | | | |
| Total Nitrogen | mg/L | | | 1 [c] | | | | 1 | |
| Phosphorus (Total) | mg/L | | | 0.1 [c] | | | | 0.1 | |
| *Field Measurements* | | | | | | | | | |
| pH | pH | | | 6.5 to 8.0 | | | | 6.5 to 8.0 | |
| *Conventionals* | | | | | | | | | |
| Nitrite as N | mg/L | | | | | 1 | | 1 | |
| Nitrate as N (Total) | mg/L | | | | | 10 | | 10 | |
| *Bacteria* | | | | | | | | | |
| Fecal Coliform | per 100 mL | | | 400 [a,b] | | | | | |
| *Elements* | | | | | | | | | |
| Chromium (Total) | µg/L | 2367 [c] | 282 [c] | | | | 2367 | | |
| Copper (Total) | µg/L | 20 [b,c] | 12.9 [b,c] | | | | 20 | | |
| Lead (Total) | µg/L | 132 [a,c] | 5.2 [a,c] | | | | 132 | | |
| Zinc (Total) | µg/L | 165 [b,c] | 165 [b,c] | | | | 165 | | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | | |
| Benzo(a)Pyrene | µg/L | | | | | 0.2 | | 0.2 | |

Sources: USEPA 2000; USEPA 2001; SDRWQCB 2011; Title 22 California Code of Regulations 64431–64449

Notes: L = liter, µg/L = micrograms per liter, MCL = maximum contaminant level, mg/L = milligrams per liter
Beneficial Uses: MUN, AGR, IND, REC-1, REC-2, WARM, COLD, WILD, SPWN

**Most Stringent Value**

1 Value selected is most stringent acute value from fresh water and marine water or saltwater in each category.

**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 Table 5, Rainbow Creek Wet and Dry Weather Mass Loading Project (2004 - 2005), Attachment A Watershed Urban Runoff Management Program Fiscal Year 2008-09 Annual Report Santa Margarita River Watershed, County of San Diego hardness value of 146 mg/l as calcium carbonate ($CaCO_3$) for Rainbow Creek (average of wet weather data).

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.

**Region 9 Basin Plan**

a The criteria were published in the Federal Register, Vol. 51, No. 45/Friday, March 7, 1986/8012-8016.

b The EPA criteria apply to water contact recreation only. The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 organisms per 100 ml. In addition, the fecal coliform concentration shall not exceed 400 organisms per 100 ml for more than 10 percent of the total samples during any 30-day period. Not a single sample reference value.

c Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. hreshold total Phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisances 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 body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.

**California Maximum Contaminant Levels (MCLs)**

1 The Basin Plans for the Central Valley Regional Water Quality Control Board and SFBRWQCB incorporate by reference the primary drinking water MCLs and secondary 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 I.3**

Reference Values for Site ID 3-397

| Constituent | Units | California Toxics Rule [1] Freshwater Acute | California Toxics Rule [1] Freshwater Chronic | Region 5 Basin Plan [1] General Objectives | Region 5 Basin Plan [1] California Drinking Water MCLs [1] | Most Stringent Value [1] CTR | Most Stringent Value [1] Basin Plan |
|---|---|---|---|---|---|---|---|
| *Field Measurements* | | | | | | | |
| pH | pH | | | 6.5 to 8.5 | | | 6.5 to 8.5 |
| *Conventionals* | | | | | | | |
| Nitrate as N (Total) | mg/L | | | 45 | 45 | | 45 |
| *Total Dissolved Solids* | mg/L | | | 250 | | | 250 |
| *Elements* | | | | | | | |
| *Chromium (Total)* | µg/L | 1096 [c] | 131 [c] | | | 1096 | |
| Copper (Total) | µg/L | 8.2 [b,c] | 5.8 [b,c] | | | 8.2 | |
| Iron (Total) | µg/L | | | 300 | | | 300 |
| Lead (Total) | µg/L | 40 [a,c] | 1.6 [a,c] | | | 40 | |
| Zinc (Total) | µg/L | 74 [b,c] | 74 [b,c] | | | 74 | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | |
| Benzo(a)Pyrene | µg/L | | | | 0.2 | | 0.2 |

Sources: USEPA 2000; USEPA 2001; CVRWQCB 2009; Title 22 California Code of Regulations 64431–64449

Notes: L = liter, µg/L = micrograms per liter, MCL = maximum contaminant level, mg/L = milligrams per liter

Beneficial Uses: MUN, AGR, PROC, IND, REC-1, REC-2, WARM, COLD, MIGR, SPWN, WILD, NAV

**Most Stringent Value**

1 Value selected is most stringent acute value from fresh water and marine water or saltwater in each category.

**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 57 mg/l as calcium carbonate ($CaCO_3$) in Table 3-7 of Sacramento Coordinated Water Quality Monitoring Program Receiving Water Monitoring Annual Data Review 2012/2013 (Sep 2013).

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.

**Region 5 Basin Plan**

1 Numerical water quality objectives are contained in Table III-1 in the Basin Plan; objectives are stated as dissolved concentrations. Objective is applicable to the maximum concentration in the Sacramento River from Keswick Dam to the I Street Bridge at City of Sacramento (13,30); American River from Folsom Dam to the Sacramento River (51); Folsom Lake (50); and the Sacramento–San Joaquin Delta.

**California Maximum Contaminant Levels**

1 The Basin Plan incorporates by reference the primary drinking water MCLs and secondary 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 I.4**

Reference Values for Site ID 10-300

| Constituent | Units | California Toxics Rule [1] Freshwater | | Region 5 Basin Plan [1] Freshwater | | | California Drinking Water MCLs | Most Stringent Value [1] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Acute | Chronic | Acute | Chronic | General Objectives | | CTR | Basin Plan |
| *Field Measurements* | | | | | | | | | |
| pH | pH | | | | | 6.5 to 8.0 | | | 6.5 to 8.0 |
| *Conventionals* | | | | | | | | | |
| Nitrate as N (Total) | mg/L | | | | | | 45 | | 45 |
| *Elements* | | | | | | | | | |
| Chromium (Total) | µg/L | 1737 [c] | 207 [c] | | | | | 1737 | |
| Copper (Total) | µg/L | 14 [b,c] | 9.3 [b,c] | | | | | 14 | |
| Iron (Total) | µg/L | | | 300 | | | | | 300 |
| Lead (Total) | µg/L | 82 [a,c] | 3.2 [a,c] | | | | | 82 | |
| Zinc (Total) | µg/L | 120 [b,c] | 120 [b,c] | | | | | 120 | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | | |
| Benzo(a)Pyrene | µg/L | | | | | | 0.2 | | 0.2 |

Sources: USEPA 2000; USEPA 2001; CVRWQCB 2009; Title 22 California Code of Regulations 64431–64449

Notes: L = liter, µg/L = micrograms per liter, MCL = maximum contaminant level, mg/L = milligrams per liter

Beneficial Uses: MUN, AGR, PROC, IND, REC-1, REC-2, WARM, COLD, MIGR, SPWN, WILD, NAV

**Most Stringent Value**

1 Value selected is most stringent acute value from fresh water and marine water or saltwater in each category.

**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 ($CaCO_3$). 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.

**Region 5 Basin Plan**

1 Numerical water quality objectives are contained in Table III-1 in the Basin Plan; objectives are stated as dissolved concentrations. Objective is applicable to the maximum concentration in the Sacramento River from Keswick Dam to the I Street Bridge at City of Sacramento (13,30); American River from Folsom Dam to the Sacramento River (51); Folsom Lake (50); and the Sacramento–San Joaquin Delta.

**California Maximum Contaminant Levels**

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 I.5**

Reference Values for Site ID 4-349

| Constituent | Units | California Toxics Rule [1] Freshwater Acute (µg/L) | California Toxics Rule [1] Freshwater Chronic (µg/L) | California Toxics Rule [1] Saltwater Acute (µg/L) | California Toxics Rule [1] Saltwater Chronic (µg/L) | Region 2 Basin Plan [1,2,3] Freshwater [1] Acute | Region 2 Basin Plan [1,2,3] Freshwater [1] Chronic (µg/L) | Region 2 Basin Plan [1,2,3] Marine Water [2] Acute | Region 2 Basin Plan [1,2,3] Marine Water [2] Chronic (µg/L) | Most Stringent Value [1] CTR (µg/L) | Most Stringent Value [1] Basin Plan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bacteria* | | | | | | | | | | | |
| Enterococcus | MPN/100 mL | | | | | 151 | | 500 | | | 151 |
| *Field Measurements* | | | | | | | | | | | |
| pH | pH | | | | | | | | | | 6.5 to 8.5 |
| *Elements* | | | | | | | | | | | |
| Chromium (Total) | µg/L | 2153 [c] | 257 [c] | | | 2153 [a,b,c,d] | 257 [a,b,c,d] | | | 2153 | 2153 |
| Copper (Total) | µg/L | 18 [b,c] | 12 [b,c] | 5.8 [c] | 3.7 [c] | 18 [a,b,c,e] | 12 [a,b,c,e] | 5.8 [a,c] | 3.7 [a,c] | 5.8 | 5.8 |
| Lead (Total) | µg/L | 114 [a,c] | 4.44 [a,c] | 221 [a,c] | 8.5 [a,c] | 114 [a,b,c,f] | 4.4 [a,b,c,f] | 221 [a,b,c] | 8.5 [a,b,c] | 114 | 114 |
| Zinc (Total) | µg/L | 150 [b,c] | 150 [a,c] | 95 [c] | 86 [c] | 150 [a] | 150 [a] | 95 [a,b,c] | 86 [a,b,c] | 95 | 95 |
| *Polychlorinated Biphenyls* | | | | | | | | | | | |
| Total PCBs | µg/L | | 0.014 [d] | | 0.03 [d] | | | | | | |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | | | | |
| Total PAHs | µg/L | | | | | | | 15 [d] | | | 15 |

Sources: USEPA 2000; USEPA 2001; SFBRWQCB 2007

Notes: L = liter, µg/L = micrograms per liter, mg/L = milligrams per liter

Beneficial Uses: IND, COMM, EST, MIGR, RARE, SPWN, WILD, REC-1, REC-2, NAV

**Most Stringent Value**

1 Value selected is most stringent acute value in each category.

**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 ($CaCO_3$) 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 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.

**Region 2 Basin Plan 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 Chromium III criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. The objectives for chromium III are based on hardness. The hardness based objectives are calculated using the following formulas where H = ln (hardness): The 4-day average objective for chromium III is $e^{(0.8190H+1.561)}$. The 1-hour average for chromium III is $e^{(0.8190\ H+3.688)}$.

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 $e^{(1.273H-1.460)}$.

**Region 2 Basin Plan 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 According to the CTR, 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 24-hour average aquatic life protection objective for total PAHs

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**Table I.6**

Reference Values for Site ID 4-324, 4-351

| Constituent | Units | California Toxics Rule [1] | | | | Region 2 Basin Plan | | | | Most Stringent Value [1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Freshwater | | Saltwater | | Freshwater [1] | | Marine Water [2] | | | |
| | | Acute | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic | CTR | Basin Plan |
| *Field Measurements* | | | | | | | | | | | |
| pH | pH | | | | | | | | | | 6.5 to 8.5 |
| *Bacteria* | | | | | | | | | | | |
| Enterococcus | MPN/100 mL | | | | | 151 | | 500 | | | 151 |
| *Elements* | | | | | | | | | | | |
| Chromium (Total) | µg/L | 5405 [c] | 644 [c] | | | 5405 [a,b,c,d] | 644 [a,b,c,d] | | | 5405 | 5405 |
| Copper (Total) | µg/L | 51.7 [b,c] | 30.5 [b,c] | 5.78 [c] | 3.73 [c] | 51.7 [a,b,c,e] | 30.5 [a,b,c,e] | 5.78 [a,c] | 3.73 [a,c] | 5.78 | 5.78 |
| Lead (Total) | µg/L | 477 [a,c] | 19 [a,c] | 221 [a,c] | 8.5 [a,c] | 477 [a,b,c,f] | 19 [a,b,c,f] | 221 [a,b,c] | 8.5 [a,b,c] | 221 | 221 |
| Zinc (Total) | µg/L | 388 [b,c] | 388 [b,c] | 95 [c] | 86 [c] | 388 [a] | 388 [a] | 95 [a,b,c] | 86 [a,b,c] | 95 | 95 |
| *Polynuclear Aromatic Hydrocarbons* | | | | | | | | | | | |
| Total PAHs | µg/L | | | | | | | 15 [d] | | | 15 |
| *Polychlorinated Biphenyls* | | | | | | | | | | | |
| Total PCBs (Aroclors) | µg/L | | 0.014 [d] | | 0.03 [d] | | | | | | |

Sources: USEPA 2000; USEPA 2001; SFBRWQCB 2007

Notes: L = liter, µg/L = micrograms per liter, mg/L = milligrams per liter,

Beneficial Uses: IND, PROC, COMM, SHELL, EST, MIGR, RARE, SPWN, WILD, REC-1, REC-2, NAV

**Most Stringent Value**

1 Value selected is most stringent acute value from fresh water and marine water or saltwater in each category.

**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 maximum allowed CTR hardness value of 400 mg/L (based on NPDES NO. CA0038628 which states hardness of 1420 mg/l as calcium carbonate ($CaCO_3$) at Red Rock RMP Monitoring Station, and Table 11 of Bay Delta Conservation Plan (Nov 2013) which states 737 mg/L for San Francisco Bay.

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 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.

**Region 2 Basin Plan 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 Chromium III criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 180 ug/l (4-day average) and 550 ug/l (1-hr. average). The objectives for chromium III are based on hardness. The values in this footnote assume a hardness of 100 mg/l $CaCO_3$. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for chromium III is $e^{(0.8190H+1.561)}$. The 1-hour average for chromium III is $e^{(0.8190\ H+3.688)}$.

e The objectives for copper are based on hardness. The table values assume a hardness of 100 mg/l $CaCO_3$. 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 $e^{(0.9422H-1.700)}$.

f The objectives for lead are based on hardness. The table values assume a hardness of 100 mg/l $CaCO_3$. 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 $e^{(1.273H-1.460)}$.

**Region 2 Basin Plan 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 h (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 According to the CTR, 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 24-hour average aquatic life protection objective for total PAHs

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**Table I.7**

Reference Values for Site ID 4-350

| Constituent | Units | California Toxics Rule [1] Freshwater Acute (µg/L) | California Toxics Rule [1] Freshwater Chronic (µg/L) | Region 2 Basin Plan [1] Freshwater Acute | Region 2 Basin Plan [1] Freshwater Chronic (µg/L) | Most Stringent Value [1] CTR (µg/L) | Most Stringent Value [1] Basin Plan |
|---|---|---|---|---|---|---|---|
| *Field Measurements* | | | | | | | |
| pH | pH | | | | | | 6.5 to 8.5 |
| *Elements* | | | | | | | |
| Chromium (Total) | µg/L | 1737 [c] | 207 [c] | 1741 [a,b,c,d] | 209 [a,b,c,d] | 1737 | 1741 |
| Copper (Total) | µg/L | 14 [b,c] | 9.3 [b,c] | 14 [a,b,c,e] | 9.4 [a,b,c,e] | 14 | 14 |
| Lead (Total) | µg/L | 82 [a,c] | 3.2 a,[c] | 82 [a,b,c,f] | 3.2 [a,b,c,f] | 82 | 82 |
| Zinc (Total) | µg/L | 120 [b,c] | 120 [b,c] | 123 [a] | 122 [a] | 120 | 123 |
| *Organics* | | | | | | | |
| Diazinon | µg/L | | | 0.1 | | | 0.1 |
| *Polychlorinated Biphenyls* | | | | | | | |
| Total PCBs | µg/L | | 0.014 [d] | | | 0.014 | |

Sources: USEPA 2000; USEPA 2001; SFBRWQCB 2007

Notes: L = liter, µg/L = micrograms per liter, mg/L = milligrams per liter

Beneficial Uses: IND, COMM, EST, MIGR, RARE, SPWN, WILD, REC-1, REC-2, NAV

**Most Stringent Value**

1 Value selected is most stringent acute value in each category.

**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 ($CaCO_3$). 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 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.

**Region 2 Basin Plan 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 Chromium III criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. The objectives for chromium III are based on hardness. The hardness based objectives are calculated using the following formulas where H = ln (hardness): The 4-day average objective for chromium III is $e^{(0.8190H+1.561)}$. The 1-hour average for chromium III is $e^{(0.8190\ H+3.688)}$.

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 $e^{(1.273H-1.460)}$.

**Table I.8**

Reference Values for Site IDs 7-09, 7-201

| Constituent | Units | California Toxics Rule [1] Freshwater Acute | California Toxics Rule [1] Freshwater Chronic | Region 4 Basin Plan | Most Stringent Value [1] CTR | Most Stringent Value [1] Basin Plan |
|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | |
| E. coli | per 100 mL | | | 235 [a] | | 235 |
| Cadmium (Total) | µg/L | 10.4 [a,b,c] | 4.4 [a,b,c] | | 10.4 | |
| Copper (Total) | µg/L | 28.04 [b,c] | 17.5 [b,c] | | 28.04 | |
| Lead (Total) | µg/L | 209 [a,c] | 8.1 [a,c] | | 209 | |
| Zinc (Total) | µg/L | 224 [b,c] | 224 [b,c] | | 224 | |
| *Field Measurements* | | | | | | |
| pH | pH | | | 6.5 to 8.5 | | 6.5 to 8.5 |
| *Conventionals* | | | | | | |
| Total Dissolved Solids | mg/L | | | 950 | | 950 |
| *Elements* | | | | | | |
| Chromium (Total) | µg/L | 3176 [c] | 379 [c] | | 3176 | |

Sources: USEPA 2000; USEPA 2001; LARWQCB 1994

Notes: L = liter, µg/L = micrograms per liter, mg/L = milligrams per liter,

Beneficial Uses: GWR, WARM, WILD, WET, REC-1, REC-2

**Most Stringent Value**

1 Value selected is most stringent acute value from each category.

**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 ($CaCO_3$) 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 0f 1.0 is assumed because no site specific data are available.

**Region 4 Basin Plan**

a Single sample limit. Resolution NO. R10-007 (July 2010) states "Regional Board staff is in the process of updating the [Basin Plan] bacteria objectives for freshwaters designated as REC-1 to remove redundancy and maintain consistency with U.S. EPA's recommended criteria. The update of bacteria objectives will remove the fecal coliform objectives and use E. coli objectives as the sole objective for freshwaters."

**Table I.9**

Reference Values for Site ID 7-336

| | | | California Toxics Rule [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Freshwater | | Saltwater | | Region 4 | Most Stringent Value [1] | |
| | Constituent | Units | Acute | Chronic | Acute | Chronic | Basin Plan | CTR | Basin Plan |
| *TMDL Specific Constituents* | | | | | | | | | |
| | Enterococcus | per 100 mL | | | | | 104 [a] | | 104 |
| | Fecal Coliform | per 100 mL | | | | | 400 [a] | | 400 |
| | Total Coliform | per 100 mL | | | | | 10000 [a] | | 10000 |
| *Field Measurements* | | | | | | | | | |
| | pH | pH | | | | | 6.5 to 8.5 | | 6.5 to 8.5 |
| *Conventionals* | | | | | | | | | |
| | Total Nitrogen | mg/L | | | | | 10 | | 10 |
| | Total Dissolved Solids | mg/L | | | | | 2000 | | 2000 |
| *Elements* | | | | | | | | | |
| | Chromium (Total) | µg/L | 5405 [c] | 644 [c] | | | | 5405 | |
| | Copper (Total) | µg/L | 52 [b,c] | 30 [b,c] | 5.8 [c] | 3.73 [c] | | 5.8 | |
| | *Lead (Total)* | µg/L | 477 [a,c] | 19 [a,c] | 221 [a,c] | 8.5 [a,c] | | 221 | |
| | Zinc (Total) | µg/L | 388 [b,c] | 388 [b,c] | 95 [c] | 86 [c] | | 95 | |

Sources: USEPA 2000; USEPA 2001; LARWQCB 1994

Notes: L = liter, µg/L = micrograms per liter, mg/L = milligrams per liter

Beneficial Uses: REC-1, REC-2, NAV, EST, MAR, WILD, RARE, MIGR, SPWN, WET

**Most Stringent Value**

1 Value selected is most stringent acute value from fresh water and marine water or saltwater in each category.

**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 calcuated using the maximum CTR hardness value of 400 mg/l as calcium carbonate ($CaCO_3$) based on average hardness of 700 mg/L in Malibu Creek & Lagoon TMDL for Sedimentation and Nutrients to Address Benthic Community Impairments, EPA Region IX (2013).

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.

**Region 4 Basin Plan**

a Single Sample Limit.

**Table I.10**

Reference Values for Site IDs 12-330, 12-336, 12-356

| Constituent | Units | California Toxics Rule [1] Freshwater Acute | California Toxics Rule [1] Freshwater Chronic | Region 8 Basin Plan General Objectives | Most Stringent Value [1] CTR | Most Stringent Value [1] Basin Plan |
|---|---|---|---|---|---|---|
| *TMDL Specific Constituents* | | | | | | |
| Toxaphene | µg/L | 0.73 | 0.0002 | | 0.73 | |
| Cadmium | µg/L | 10.8 [b,c,d,e] | 4.2 [b,c,d,e] | | 10.8 | |
| Copper | µg/L | 30.2 [c,d,e] | 19 [c,d,e] | | 30.2 | |
| Lead | µg/L | 162 [b,d,e] | 6.3 [b,d,e] | | 162 | |
| Zinc | µg/L | 243 [c,d,e] | 245 [c,d,e] | | 243 | |
| 4,4'-DDT | µg/L | 1.1 [a] | 0.001 [a] | | 1.1 | |
| *Field Measurements* | | | | | | |
| pH | pH | | | 6.5 to 8.5 | | 6.5 to 8.5 |
| *Conventionals* | | | | | | |
| Total Dissolved Solids | mg/L | | | 1500 | | 1500 |
| *Elements* | | | | | | |
| Chromium (Total) | µg/L | 3508 [d] | 418 [d] | | 3508 | |
| Copper (Total) | µg/L | 31.4 [c,d] | 19 [c,d] | | 31.4 | |
| Lead (Total) | µg/L | 244 [b,d] | 9.5 [b,d] | | 244 | |
| Zinc (Total) | µg/L | 248 [c,d] | 248 [c,d] | | 248 | |

Sources: USEPA 2000; USEPA 2001; CRWQCB-SAR 2011

Notes: L = liter, µg/L = micrograms per liter, mg/L = milligrams per liter

Beneficial Uses: REC-1, REC-2, WARM, WILD

**Most Stringent Value**

1 Value selected is most stringent acute value from fresh water and marine water or saltwater in each category.

**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 ($CaCO_3$) 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).