



*Ventura Countywide
Stormwater Quality
Management Program*

2016-2017
Permit Year

Ventura Countywide Stormwater Quality Management Program Annual Report

Attachment E - TMDL Reports



December 15, 2017

Camarillo
County of Ventura
Fillmore
Moorpark
Ojai
Oxnard
Port Hueneme
Santa Paula
Simi Valley
Thousand Oaks
Ventura
Ventura County Watershed Protection District

DECEMBER 15, 2016

Calleguas Creek Watershed TMDL Compliance Monitoring Program

Eighth Year Annual Monitoring Report – July 2015 to June 2016

Monitoring and Reporting Program for the Nitrogen
and Related Effects; Organochlorine Pesticides,
Polychlorinated Biphenyls and Siltation; Toxicity;
Salts; and Metals and Selenium Total Maximum
Daily Loads

submitted to:

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

prepared by:

LARRY WALKER ASSOCIATES

on behalf of the:

STAKEHOLDERS IMPLEMENTING TMDLS IN THE CALLEGUAS
CREEK WATERSHED



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- Appendix B. Calibration Event Summary for Salts TMDL
- Appendix C. Salts Rating Curves and Surrogate Relationships
- Appendix D. Toxicity Testing and Toxicity Identification Evaluations Summary
- Appendix E. Laboratory QA/QC Results and Discussion

Attachments – Electronic Documents

- Attachment 1. Toxicity Data
- Attachment 2. Monitoring Data
- Attachment 3. Salts Mean Daily Flows: July 2014-June 2015
- Attachment 4. Chain-of-Custody Forms

Acronyms

Ag Waiver	Conditional Waiver for Irrigated Agricultural Lands
AMR	Annual Monitoring Report
AWQMP	Agriculture Water Quality Management Plan
BPAs	Basin Plan Amendments
BMP	Best Management Practice
Caltrans	California Department of Transportation
CCW	Calleguas Creek Watershed
CCWTMP	Calleguas Creek Watershed TMDL Compliance Monitoring Program
DNQ	Detected Not Quantified
EC	Electrical Conductivity
EST	Estimated
GSQC	General Sediment Quality Constituents
GWQC	General Water Quality Constituents
LA	Load Allocation
MOA	Memorandum of Agreement
MDL	Method Detection Limit
NA	Not Applicable
ND	Not Detected
NS	Not Sampled
OC	Organochlorine

OP	Organophosphorus
PCBs	Polychlorinated Biphenyls
POTWs	Publically-Owned Treatment Works
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RL	Reporting Limit
SOPs	Standard Operating Procedures
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TSS	Total Suspended Solids
VCAILG	Ventura County Agricultural Irrigated Lands Group
WLA	Wasteload Allocation

Executive Summary

The purpose of this annual report is to document the eighth-year monitoring (July 2015 to June 2016) efforts and results of the Calleguas Creek Watershed (CCW) Total Maximum Daily Load (TMDL) Compliance Monitoring Program (CCWTMP) for the five TMDLs covered by the Quality Assurance Project Plan (QAPP). This annual report includes summaries of the sampling events, data summaries, and a compliance comparison.

TOTAL MAXIMUM DAILY LOADS

There are six TMDLs currently effective and being implemented in the Calleguas Creek Watershed. They include:

- Nitrogen Compounds and Related Effects in Calleguas Creek (Nitrogen or Nutrients TMDL)
- Organochlorine (OC) Pesticides, Polychlorinated Biphenyls (PCBs) and Siltation in Calleguas Creek, its Tributaries, and Mugu Lagoon (OC Pesticides TMDL)
- Toxicity, Chlorpyrifos, and Diazinon in the Calleguas Creek, its Tributaries and Mugu Lagoon (Toxicity TMDL)
- Metals and Selenium in Calleguas Creek, its Tributaries, and Mugu Lagoon (Metals TMDL)
- Revolon Slough and Beardsley Wash Trash TMDL (Trash TMDL)¹
- Boron, Chloride, Sulfate and TDS (Salts) in the Calleguas Creek, its Tributaries and Mugu Lagoon (Salts TMDL)

To address the monitoring requirements of the TMDLs, the CCWTMP was established and a QAPP developed and approved by the Los Angeles Regional Water Quality Control Board (Regional Water Board) Executive Officer. Over time the original QAPP has been revised to incorporate newly adopted TMDLs, reflect changing field conditions, and include changes recommended in previous annual monitoring reports. The QAPP currently addresses monitoring requirements for the Nitrogen, OC Pesticides, Toxicity, Metals, and Salts TMDLs. The Trash TMDL is addressed through a separate monitoring plan and annual monitoring report.

PROJECT ORGANIZATION

The CCWTMP is a coordinated effort with the various responsible parties that make up the Stakeholders Implementing TMDLs in the Calleguas Creek Watershed (Stakeholders). Stakeholders identified in the TMDLs have developed a Memorandum of Agreement (MOA) that outlines an agreement to implement the CCWTMP.

The stakeholders to the MOA, for which this report fulfills the TMDL monitoring requirements, are as follows:

¹ Information related to the Revolon Slough and Beardsley Wash Trash TMDL is not part of this report. The Trash TMDL annual report is also submitted to the Regional Water Board on December 15th, annually.

- **POTWs:** consisting of Camrosa Water District, Camarillo Sanitary District, Ventura County Waterworks District No. 1, and the Cities of Simi Valley and Thousand Oaks;
- **Urban Dischargers:** consisting of the Cities of Simi Valley, Thousand Oaks, Camarillo, Moorpark and Oxnard, Ventura County Watershed Protection District, and the County of Ventura Public Works Agency;
- **Agricultural Dischargers:** consisting of the entities represented by the Ventura County Agricultural Irrigated Lands Group (VCAILG) within the Calleguas Creek Watershed, a subdivision of the Farm Bureau of Ventura County; and
- **Other Dischargers:** consisting of the U.S. Department of Navy and Caltrans.

MONITORING EVENT SUMMARIES

Sampling events required by the Nitrogen, OC Pesticides, Toxicity, Metals, and Salts TMDLs during the eighth year of TMDL monitoring included four dry-weather events (Events 50, 51, 54, 55) and two wet weather events (Events 52 and 53). Grab samples for salts were obtained during these events, but were not used directly to determine compliance at receiving water sites.² A summary of Events 50 through 55 is included in Table ES-1.

Table ES - 1. Summary of Year 8 Monitoring Events

Event	Type	Date	Mugu Lagoon			Freshwater Sites		
			Water Quality	Sediment Quality & Toxicity ¹	Tissue ¹	Water Quality & Toxicity	Sediment Quality & Toxicity	Tissue
50	Dry	Aug 2015	X			X	X	
51	Dry	Nov 2015	X			X		
52	Wet	Jan 2016	X			X		
53	Wet	Jan 2016	X			X		
54	Dry	Feb 2016	X			X		
55	Dry	May 2016	X			X		X ²

1. Mugu Lagoon sediment quality, sediment toxicity, and tissue samples are collected every three years. During year 10 is the next time these types of samples will be collected.
2. Fish tissue collected in May 2016 as part of Event 55.

SUMMARY OF COMPARISON TO TMDL ALLOCATIONS AND TARGETS

This report provides a comparison of water quality monitoring results to applicable TMDL allocations and targets, but does not reflect an assessment of compliance with individual permit or conditional waiver TMDL requirements for the responsible parties. For the most part, the CCW is meeting the applicable interim or final waste load allocations (WLAs) and load allocations (LAs) currently in effect for the Nutrients, OC Pesticides, Toxicity, Metals, and Salts TMDLs. The following observations summarize the comparison of monitoring results with applicable TMDL allocations:

² Grab samples for salts at receiving water compliance sites are used to develop statistical relationships between specific conductivity (EC) and salt constituents, which are in turn used to convert high-density EC data from continuous monitors in the field to time series of salt concentrations.

- No exceedances of the interim wasteload allocations or load allocations for OCs or PCBs were observed at any location in the watershed.
- Exceedances of numeric targets for Nitrate-N and Nitrate-N + Nitrite-N were observed in Mugu Lagoon, Revolon Slough, Beardsley Wash, Calleguas Creek, and Arroyo Simi. Most of the exceedances occurred during dry events, but there were 12 wet weather exceedances in Mugu Lagoon, Calleguas Creek, and Beardsley Wash. No exceedances of final nutrient WLAs were measured at any POTW.
- Two exceedances of the final MS4 wasteload allocations for chlorpyrifos were measured at receiving water sites during the dry weather; however, there were no exceedances of the interim load allocations. There were six exceedances of the final MS4 chlorpyrifos wasteload allocation during wet weather, but there were no instances where the chlorpyrifos concentration was above the interim load allocation. In addition, there was one instance where the diazinon final MS4 wasteload allocation was exceeded during wet weather and no instances where the interim load allocation was exceeded. These exceedances were considered in concert with MS4 outfall monitoring data and MS4 outfalls only exceeded the final allocations during 1 of these monitoring events. There were no exceedances of the final WLAs for chlorpyrifos or diazinon at any POTW.
- There were four exceedances of the interim load allocation or final MS4 wasteload allocation for total selenium measured during the four dry weather sampling events of 2015-2016 at the 04_WOOD site. As discussed in the TMDL, a primary source of selenium in Revolon Slough is considered to be rising groundwater levels and the interim allocations were to be considered in this context. Additionally, there was one wet weather exceedance of the interim LA and interim WLA for total nickel at the 04_WOOD site.
- Although toxicity was observed at some locations in the watershed, toxicity events did not meet the TIE triggering requirements as detailed in the QAPP. As a result, the Stakeholders are in compliance with the toxicity WLAs and LAs per the requirements of the TMDL.
- In general, receiving water sites were in compliance with interim LAs and MS4 WLAs established by the Salts TMDL; the only exception being exceedances in TDS, sulfate, and boron measured at 04_WOOD in the Revolon Slough watershed, and two exceedances in chloride at 03_UNIV. POTWs are in compliance with interim salts WLAs, with the exception of Camarillo Water Reclamation Plant (WRP), which experienced exceedances of chloride, sulfate, and TDS. The exceedances of interim salts WLAs for the Camarillo WRP have resulted from increased influent salt concentrations due to water conservation and a shift in the composition of the water supplied within the service area. Because the process for addressing salts is a watershed effort involving significant capital investments, the Camarillo WRP received an amended Time Schedule Order in 2015 with adjusted interim limits for TDS, sulfate and chloride. As a result, the interim limits in the TMDL are not the currently applicable interim limits for the Camarillo WRP discharge.

MONITORING PROGRAM CHANGES

A revised QAPP was submitted to the Los Angeles Regional Water Quality Control Board (Regional Water Board) in December 2014. Although official approval of the revised QAPP has

not yet been received by the Stakeholders, monitoring for the Year 8 2015-2016 monitoring year was conducted per the revised QAPP under the assumption that no response from the Regional Water Board indicated there were no requested changes to the revised QAPP. The QAPP was updated to incorporate the Salts TMDL monitoring approach. The QAPP was also updated for all constituents to reflect the recommendations identified in prior annual reports and reflect monitoring adjustments that have been implemented due to field conditions.

The revised QAPP details the replacement of two monitoring sites in Reach 7 with new locations, and the reduction of monitoring requirements at certain locations taking into consideration TMDL compliance status. In addition to the updates identified in the 2014 revised QAPP, access to 06_SOMIS in Arroyo Los Posas has been revoked by the landowner. Therefore, the site was only visited during the first two monitoring events. A replacement site has been identified and is being sampled in the current monitoring year (Year 9).

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Introduction and Program Background

INTRODUCTION

In the Calleguas Creek Watershed (CCW), the following six total maximum daily loads (TMDLs) are currently effective and include monitoring requirements in the implementation plans:

- Nitrogen Compounds and Related Effects in Calleguas Creek (Nitrogen or Nutrients TMDL)
- Organochlorine (OC) Pesticides, Polychlorinated Biphenyls (PCBs) and Siltation in Calleguas Creek, its Tributaries, and Mugu Lagoon (OC Pesticides TMDL)
- Toxicity, Chlorpyrifos, and Diazinon in the Calleguas Creek, its Tributaries and Mugu Lagoon (Toxicity TMDL)
- Metals and Selenium in Calleguas Creek, Its Tributaries, and Mugu Lagoon (Metals TMDL)
- Revolon Slough and Beardsley Wash Trash TMDL (Trash TMDL) ¹
- Boron, Chloride, Sulfate and TDS (Salts) in the Calleguas Creek, its Tributaries and Mugu Lagoon (Salts TMDL)

To address the monitoring requirements of the TMDLs, the CCWTMP was established and a QAPP developed and approved by the Los Angeles Regional Water Quality Control Board (Regional Water Board) Executive Officer. Over time the original QAPP has been revised to incorporate newly adopted TMDLs, reflect changing field conditions, and include changes recommended in previous annual monitoring reports. The QAPP currently addresses monitoring requirements for the Nitrogen, OC Pesticides, Toxicity, Metals, and Salts TMDLs. The Trash TMDL is addressed through a separate monitoring plan and annual monitoring report.

A monitoring approach (Salts Plan) for the Salts TMDL was submitted by the Stakeholders to the Regional Water Board in June 2009, which was conditionally approved in September 2011. Compliance monitoring for the Salts TMDL was required starting September 9, 2012.

The primary purpose of this report is to document the eighth year monitoring efforts (July 2015 to June 2016) and results of the CCWTMP for the five TMDLs included in the QAPP. The report includes summaries of the sampling events, data summaries, and a comparison to applicable TMDL allocations and targets. The report is divided into the following sections:

- Introduction and Program Background
- Monitoring Program Structure
- Monitoring Data Summary
- Exceedance Evaluation and Discussion
- Revisions and Recommendations

¹ Information related to the Revolon Slough and Beardsley Wash Trash TMDL is not part of this report. The Trash TMDL annual report is submitted to the Regional Water Board annually on December 15th.

In addition, there are several appendices included with this report and several attachments (electronic data files) associated with this report, including:

- Appendices (text documents)
 - Appendix A: Monitoring Event Summaries for Toxicity, OC Pesticides, Nutrients, Metals, and Salts TMDLs
 - Appendix B: Calibration Event Summary for Salts TMDL
 - Appendix C: Salts Rating Curves and Surrogate Relationships
 - Appendix D: Toxicity Testing and Toxicity Identification Evaluations Summary
 - Appendix E: Laboratory Quality Assurance/Quality Control Results and Discussion
- Attachments (electronic data files)
 - Attachment 1: Toxicity Data
 - Attachment 2: Monitoring Data
 - Attachment 3: Salts Mean Daily Flows: July 2015 to June 2016
 - Attachment 4: Chain-of-Custody Forms

PROJECT ORGANIZATION

The CCWTMP is a coordinated effort where the various responsible parties identified in the TMDLs have developed a Memorandum of Agreement (MOA) that outlines an agreement to implement the CCWTMP. The responsible parties identified in the organizational structure have formally joined together to fulfill their monitoring requirements as outlined in the Basin Plan Amendments (BPAs) for the five TMDLs included in the QAPP.

The CCWTMP is intended to fulfill the monitoring requirements for only those stakeholders that are part of the MOA and/or identified by the participants of the MOA. The stakeholders to the MOA for which this report fulfills the TMDL monitoring requirements are as follows:

- **POTWs:** consisting of Camrosa Water District, Camarillo Sanitary District, Ventura County Waterworks District No. 1, and the Cities of Simi Valley and Thousand Oaks;
- **Urban Dischargers:** consisting of the Cities of Simi Valley, Thousand Oaks, Camarillo, Moorpark and Oxnard, Ventura County Watershed Protection District, and the County of Ventura Public Works Agency;
- **Agricultural Dischargers:** consisting of the entities represented by the Ventura County Agricultural Irrigated Lands Group (VCAILG) within the Calleguas Creek Watershed, a subdivision of the Farm Bureau of Ventura County; and
- **Other Dischargers:** consisting of the U.S. Department of the Navy and the California Department of Transportation (Caltrans).

Per the MOA, a Management Committee, consisting of one representative each from the POTWs, Urban Dischargers and Other Dischargers groups, and two representatives from the Agricultural Dischargers group, oversees the CCWTMP and makes decisions to assure the CCWTMP is carried out in a timely, accountable fashion.

Prior to the initiation of the first required sampling event in 2008, the Stakeholders contracted the day-to-day management of the CCWTMP activities and field sampling activities. The following contractors performed the following tasks during the sixth year monitoring effort:

- **General Project Management** - Larry Walker Associates, Inc. (LWA)
- **Field Monitoring Activities**
 - **Mugu Lagoon Water Quality Sampling** - MBC Applied Environmental Sciences (MBC)
 - **Freshwater Water Quality/Sediment Sampling** - Kinnetic Laboratories, Inc. (KLI), Fugro West, Inc. (Fugro), LWA
 - **Freshwater Fish Tissue** – Cardno ENTRIX
 - **Bird Egg Collection** – Naval Base Ventura County Environmental Staff
- **Water, Sediment, and Tissue Chemistry Analysis** - Physis Environmental Laboratories, Inc. (Physis)
- **Salts Chemistry Analysis** - Fruit Growers Laboratory, Inc. (FGL) and Physis
- **Toxicity Analysis** - Pacific Eco Risk Laboratories (PacEco)

The aforementioned contractors performed all the management activities and sampling efforts covered by this annual report. All field contractors are the same as used in last year's sampling efforts. As the monitoring program moves forward this list of contractors may continue to be amended to reflect new contractors hired on to perform required or new duties per the decision of the Stakeholders in the CCW.

WATERSHED BACKGROUND

Calleguas Creek drains an area of approximately 343 square miles from the Santa Susana Pass in the east to Mugu Lagoon in the southwest. The main surface water system drains from the mountains in the northeast part of the watershed toward the southwest where it flows through the Oxnard Plain before emptying into the Pacific Ocean through Mugu Lagoon. The watershed, which is elongated along an east-west axis, is approximately thirty miles long and fourteen miles wide. The Santa Susana Mountains, South Mountain, and Oak Ridge form the northern boundary of the watershed; the southern boundary is formed by the Simi Hills and Santa Monica Mountains. Figure 1 depicts the CCW and Table 1 presents the reaches of the CCW as identified in the TMDLs covered by the CCWTMP.

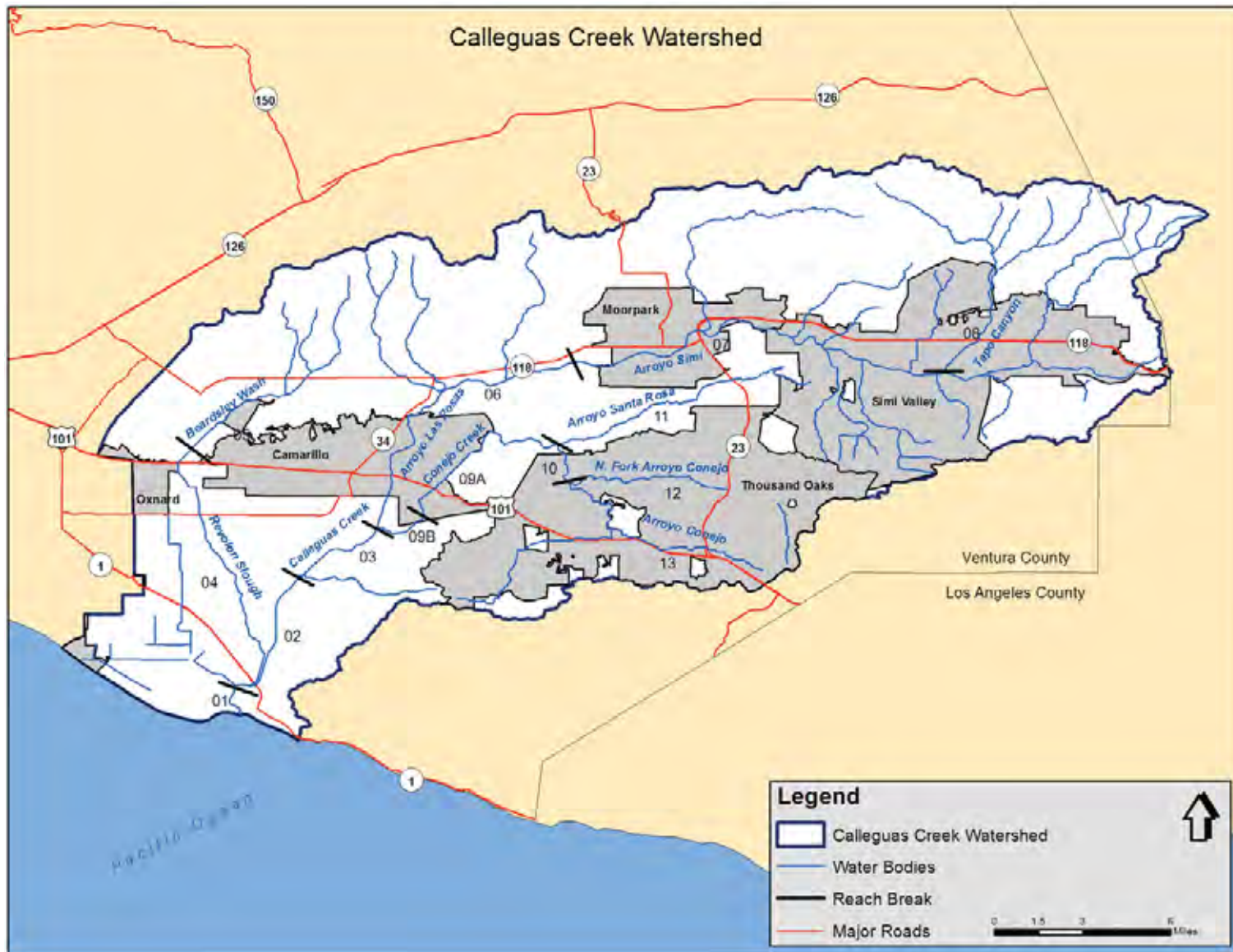


Figure 1. Calleguas Creek Watershed

Table 1. Description of Calleguas Creek Watershed Reaches

Reach No.	Reach Name	Subwatershed	Geographic Description
1	Mugu Lagoon	Mugu	Lagoon fed by Calleguas Creek
2	Calleguas Creek (Estuary to Potrero Rd.)	Calleguas	Downstream (south) of Potrero Rd
3	Calleguas Creek (Potrero Rd. to Conejo Creek)	Calleguas	Potrero Rd. upstream to confluence with Conejo Creek
4	Revolon Slough	Revolon	Revolon Slough from confluence with Calleguas Creek to Central Ave
5	Beardsley Channel	Revolon	Revolon Slough upstream of Central Ave.
6	Arroyo Las Posas	Las Posas	Confluence with Calleguas Creek to Hitch Road
7	Arroyo Simi	Arroyo Simi	End of Arroyo Las Posas (Hitch Rd) to headwaters in Simi Valley.
8	Tapo Canyon Creek	Arroyo Simi	Confluence w/ Arroyo Simi up Tapo Canyon to headwaters
9B ¹	Conejo Creek (Camrosa Diversion to Arroyo Santa Rosa)	Conejo	Extends from the confluence with Arroyo Santa Rosa downstream to the Conejo Creek Diversion.
9A ¹	Conejo Creek (Calleguas Creek to Camrosa Diversion)	Conejo	Extends from Conejo Creek Diversion to confluence with Calleguas Creek.
10	Hill Canyon reach of Conejo Creek	Conejo	Confluence with Arroyo Santa Rosa to confluence with N. Fork; and N. Fork to just above Hill Canyon WTP
11	Arroyo Santa Rosa	Conejo	Confluence with Conejo Creek to headwaters
12	North Fork Conejo Creek	Conejo	Confluence with Conejo Creek to headwaters
13	Arroyo Conejo (South Fork Conejo Creek)	Conejo	Confluence with N. Fork to headwaters —two channels

1. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched.

MONITORING QUESTIONS

The purpose of the CCWTMP is to direct the monitoring activities conducted to meet the requirements of the TMDLs effective for the CCW, excluding the Trash TMDL. The goals of the CCWTMP include:

- To determine compliance with numeric targets, waste load and load allocations, and interim load reduction milestones.
- To test for sediment toxicity at sediment monitoring stations.
- To identify causes of unknown toxicity.
- To generate additional land use runoff data to better understand pollutant sources and proportional contributions from various land use types.

- To monitor the effect of implementation actions by urban, POTW, and agricultural dischargers on in-stream water, sediment, fish tissue quality, and watershed balances (salts).
- To implement the program consistent with other regulatory actions within the CCW.

In addition, the CCWTMP is intended to answer the following monitoring questions to meet the goals of the program:

- Are numeric targets and allocations met at the locations indicated in the TMDLs?
- Are conditions improving?
- What is the contribution of constituents of concern from various land use types?

MONITORING PROGRAM DESCRIPTION

The CCWTMP was developed to address all necessary TMDL monitoring requirements and answer the monitoring questions mentioned previously using the following monitoring elements.

Required Monitoring Elements

The following environmental monitoring elements are required by the TMDLs' BPAs and are included in the CCWTMP:

- General water and sediment quality constituents;
- Water column and sediment toxicity;
- Metals and selenium in water, sediment, fish tissue, and bird eggs;
- Organic compounds in water, sediment, and fish tissue; and,
- Nitrogen and phosphorus compounds in water.
- Salt compounds in water and continuous flow in dry weather (the latter only at Salts TMDL receiving water compliance sites)

Table 2 lists the constituents for which analyses are conducted. Table 2 also provides a summary of sampled constituent groups and sampling frequency. The QAPP outlines, in detail, the justification of the process design, specific methodologies (both field and analytical), and quality assurance/quality control (QA/QC) procedures.

Table 2. Constituents and Monitoring Frequency for CCWTMP (varies by site)

Constituent	Frequency
<i>Chronic Aquatic Toxicity</i>	Quarterly + Two wet events
<i>General Water Quality Constituents (GWQC)</i>	
Flow, pH, Temperature, Dissolved Oxygen, Conductivity, Total Suspended Solids (TSS), Hardness (at freshwater sites where metals samples are collected), and Dissolved Organic Carbon (at saltwater sites where metals samples are collected)	Quarterly based on location + Two wet events
<i>Nutrients</i>	
Ammonia Nitrogen, Nitrate Nitrogen, Nitrite Nitrogen, Organic Nitrogen, Total Kjeldahl Nitrogen (TKN), Total Phosphorus, Orthophosphate-P	Quarterly + Two wet events
<i>Organic Constituents In Water</i>	
OC Pesticides ¹ and PCBs ² , OP ³ , Triazine ⁴ , and Pyrethroid ⁵ Pesticides	Quarterly + Two wet events
<i>Metals and Selenium In Water</i> ⁶	
Copper, Mercury, Nickel, Zinc, and Selenium ⁸	Quarterly + Two wet events ⁷
<i>Salts</i>	
Electrical Conductivity (EC) and Discharge	Receiving water: Continuous (via in-situ sensors for EC and depth) plus monthly grabs for EC and discharge for sensor calibration
Total Dissolved Solids (TDS), Sulfate, Chloride, Boron	Receiving water: Continuous (derived from EC/salt relationships) Other sites: Quarterly + Two wet events
<i>Chronic Sediment Toxicity</i>	Annually (Every three years in Lagoon)
<i>General Sediment Quality Constituents (GSQC)</i>	
Total Ammonia, Percent Moisture, Grain Size Analysis, Total Organic Carbon (TOC)	Annually (Every three years in Lagoon)
<i>Organic Constituents In Sediment</i>	
OC Pesticides ¹ and PCBs ² , OP Pesticides ³ , and Pyrethroids ⁵	Annually (Every three years in Lagoon)

Table 2. Constituents and Monitoring Frequency for CCWTMP (varies by site) - continued

Additional Constituents For Mugu Lagoon Sediment	
Metals ⁹	Every three years
Tissue	Annually (Every three years in Lagoon)
Percent Lipids, OC Pesticides ¹ and PCBs ¹⁰ , OP Pesticides ³ , and Metals ¹¹	
<ol style="list-style-type: none"> 1. OC Pesticides considered: aldrin, alpha-BHC, beta-BHC, gamma-BHC (lindane), delta-BHC, chlordane-alpha, chlordane-gamma, 2,4'-DDD, 2,4'-DDE, 2,4'-DDT, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin, endosulfan I and II, endosulfan sulfate, endrin, endrin aldehyde, endrin ketone, and toxaphene 2. PCBs in water and sediment considered: Aroclors identified in the CTR (1016, 1221, 1232, 1242, 1248, 1254, and 1260). 3. OP Pesticides considered: chlorpyrifos, diazinon, and malathion. Chlorpyrifos is the only OP pesticide that will be measured in tissue, as it is the only OP listed in tissue. 4. Triazine Pesticides considered: atrazine, prometryn, and simazine. Analysis of triazines ceased during year 3 following the recommendation being included in the Revisions and Recommendations section of both the year 1 and year 2 annual reports. 5. Pyrethroid Pesticides considered: bifenthrin, cyfluthrin, cypermethrin, deltamethrin, and permethrin 6. Copper, mercury, nickel, selenium and zinc will be measured as dissolved and total recoverable. 7. Per the Metals TMDL BPA requires that "In-stream water column samples will be collected monthly for analysis of general water quality constituents (GWQC) and, copper, mercury, nickel, selenium, and zinc for the first year. After the first year, the Executive Officer will review the monitoring report and revise the monitoring frequency as appropriate." Monthly monitoring will be suspended until such time as the Executive Officer has reviewed the monitoring report and considered revisions to the monitoring frequency. Until the Executive Officer has considered the frequency, metals will be collected quarterly in conjunction with the other TMDLs. 8. Monitoring at sites in Mugu Lagoon other than at the Ronald Reagan Street Bridge Site (01_RR_BR) for metals is an optional element. 9. Includes arsenic, cadmium, copper, lead, mercury, nickel, selenium and zinc. Arsenic, lead, and cadmium are included in addition to constituents required in the Metals TMDL as they have been found in previous sediment studies conducted in Mugu Lagoon to exceed guideline values used to interpret the relationship between sediment chemistry and biological impacts. 10. PCBs in tissue considered: individual congeners. 11. Total mercury and selenium will be measured in bird eggs and methyl mercury and total selenium will be measured in fish tissue. 	

Optional Monitoring Elements

The QAPP outlines the optional monitoring efforts, all of which are considered above and beyond what is necessary to meet the requirements of the BPAs and answer the monitoring questions.

Table 3 lists the constituents and analyses that are considered optional for the CCWTMP. Monitoring for the constituents and conducting the analyses are not BPA requirements but are important to meeting general program goals and answering program questions. Table 3 also provides a general sampling frequency for each constituent group.

Table 3. Optional Constituents and Monitoring Frequency for CCWTMP (varies by site)

Constituent	Frequency
<i>Organic Constituents in Water – Grain Size Fractions</i>¹	
OC Pesticides and PCBs, OP, and Pyrethroid Pesticides	One wet event annually
<i>Organic Constituents in Sediment – Grain Size Fractions</i>¹	
OC Pesticides and PCBs, OP, and Pyrethroid Pesticides	Annually (Every three years in Mugu Lagoon)
<i>Additional Constituents for Mugu Lagoon Sediment</i>	
Macrobenthic community assessment	Every three years ²
Sediment Toxicity – <i>Eohaustorius estuaries</i> and <i>Mytilus galloprovincialis</i>	
PCBs ³ and PAHs ⁴	

1. Please see Table 2 for a list of individual constituents in each suite.

2. Mugu Lagoon assessments were conducted during the first, fourth, and seventh monitoring years.

3. PCBs considered: 2,4'-Dichlorobiphenyl, 2,2',5'-Trichlorobiphenyl, 2,4,4'-Trichlorobiphenyl, 2,2',3,5'-Tetrachlorobiphenyl, 2,2',5,5'-Tetrachlorobiphenyl, 2,3',4,4'-Tetrachlorobiphenyl, 2,2',4,5,5'-Pentachlorobiphenyl, 2,3,3',4,4'-Pentachlorobiphenyl, 2,3',4,4',5-Pentachlorobiphenyl, 2,2',3,3',4,4'-Hexachlorobiphenyl, 2,2',3,4,4',5'-Hexachlorobiphenyl, 2,2',4,4',5,5'-Hexachlorobiphenyl, 2,2',3,3',4,4',5-Heptachlorobiphenyl, 2,2',3,4,4',5,5'-Heptachlorobiphenyl, 2,2',3,4,4',5,5'-Heptachlorobiphenyl, 2,2',3,4',5,5',6-Heptachlorobiphenyl, 2,2',3,3',4,4',5,6-Octachlorobiphenyl, 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl, Decachlorobiphenyl

4. PAHs considered: 1-Methylnaphthalene, 1-Methylphenanthrene, 2,6-Dimethylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Anthracene, Biphenyl, Fluorene, Naphthalene, Phenanthrene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(e)pyrene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Perylene, Pyrene.

Special Studies

The Nitrogen, Toxicity, OC Pesticides, Salts, and Metals TMDL Implementation Plans identify required and optional special studies to investigate a range of issues. No specific special studies results are incorporated into this annual report summary at this time as the results of all special studies conducted to date have been submitted as separate reports. Data gathered during special study specific sampling may also be utilized to further answer not only the special studies questions, but also be applied to the overall CCWTMP goals and questions identified previously in this report.

Monitoring Program Structure

As outlined previously, the CCWTMP covers a broad range of TMDL monitoring requirements, including both required and optional efforts. The overall structure of these requirements per each event can be broken down into two categories: (1) compliance monitoring and (2) investigation monitoring. Compliance monitoring sites are typically located in receiving water bodies where 303(d) listings occur, and are considered points of compliance measurements. The investigational sites are located throughout the watershed, and include monitoring of drain outfalls. The purpose of these sites is not to measure compliance, but to assist with evaluating land use-specific contributions of various constituents to the watershed.

The CCWTMP effort is also divided into two monitoring efforts: (1) dry weather monitoring and (2) wet weather storm water monitoring. The following sections describe, in detail, the basis for each monitoring effort, starting with the definitions of the compliance monitoring sites and investigation monitoring sites. Specific monitoring efforts associated with each sample site are included, including the frequency of sampling by site for both dry weather and wet weather events. The sampling frequency and the constituents monitored for at the sites covered by the CCWTMP vary. A more detailed description of each topic covered can be found in the appropriate element of the QAPP, including standard operating procedures (SOPs) for field collection and sample handling techniques, and analytical procedures and protocols including minimum detection limit (MDL) and reporting limit (RL) requirements.

COMPLIANCE MONITORING

Compliance Monitoring for Toxicity, OC Pesticides, Metals, Nitrogen, and Salts TMDLs

For compliance monitoring to address the Toxicity, OC Pesticides, Metals and Nitrogen TMDLs, dry weather in-stream water column samples were collected quarterly for water column toxicity, general water quality constituents (GWQC), target organic constituents, metals, and nutrients. Target organic constituents for the OC Pesticides TMDL include the OC Pesticides and PCBs listed as a footnote in Table 2. Target organic constituents for the Toxicity TMDL include the OP and pyrethroid pesticides listed as a footnote in Table 2. Target metals for the Metals and Selenium TMDL are listed as a footnote in Table 2.

In-stream water column samples to measure compliance for the Toxicity, OC Pesticides, and Metals TMDLs are generally collected at the base of each of the subwatersheds used to assign waste load and load allocations, per the BPAs.¹ In-stream water column samples to measure compliance for the Nitrogen TMDL are generally collected at the base of each listed reach. Toxicity Identification Evaluations (TIEs) are conducted on toxic samples as outlined in the Toxicity Testing and TIE section of the QAPP and results of these are discussed in the Toxicity Testing and TIE Evaluations Summary section of this report.

In-stream water column grab samples for salts were also collected quarterly during dry weather and twice during wet weather at the base of each of the subwatersheds specified in the Salts TMDL. The grab sample results are used to develop statistical relationships between salt

¹ The QAPP includes an optional metals monitoring element to monitor additional sites in Mugu Lagoon.

constituents and EC. These relationships are used to convert high frequency EC-sensor data to time-series of salt concentrations. Compliance with interim dry weather salt allocations is determined using monthly mean salt concentrations for dry weather developed from the time-series of data.

Additionally, POTW effluent was monitored for compliance with the effluent limits presented in the Toxicity, OC Pesticides, Metals, and Salts TMDL BPAs. Currently, POTWs collect data required by each of their individual monitoring requirements. For additional TMDL constituents not currently sampled by the plants, CCWTMP crews perform sampling as necessary (efforts vary by plant and constituent group). All CCWTMP-required data for POTWs are compiled in this report.

All efforts are made to include two wet weather water sampling events for compliance monitoring for the OC Pesticides, Toxicity, Metals, and Salts TMDLs during targeted storm events between October and April. Two wet weather events were completed in January 2016.

Streambed sediment samples, collected annually in the freshwater portion of the watershed, were collected during the first event of this monitoring year and analyzed for sediment toxicity, general sediment quality constituents (GSQC), and target organics. Sediment samples in Mugu Lagoon are collected every three years per the approved QAPP, and were not collected during year eight.

Similar to the sediment sampling frequency, fish tissue samples were only collected in the freshwater portions of the watershed during year eight in May 2016, and will continue to be collected annually for the CCWTMP. As tissue samples are collected every three years in Mugu Lagoon, samples will be collected again in year 10.

INVESTIGATION MONITORING

Investigation monitoring focuses on identifying the contribution of constituents of concern from various land uses in the watershed and areas where toxicity has been observed to occur in the past that are not addressed by compliance monitoring. These sites are meant to compliment compliance monitoring efforts, fill data gaps where identified, and assist in identification of sources of constituents that may be leading to non-compliant conditions. The following describes the various types of investigation sites sampled during this reporting period.

Land Use Discharge Investigation

Land use discharge samples are generally collected concurrently (on the same day when possible) with compliance monitoring at representative agricultural and urban discharge sites generally located in each of the subwatersheds and analyzed for selected GWQC, metals, and target organic constituents (constituents monitored per site varies based upon sub-watershed).

Toxicity Investigation

As significant mortality had not occurred at the two sediment toxicity investigation sites during the first three years of the CCWTMP, ceasing investigation monitoring was recommended in the third year annual report. Toxicity testing at the investigation sites ceased until Event 38, when it was resumed to support delisting of the identified reaches. The normal annual sampling frequency for this investigation is provided in Table 6.

Sediment toxicity investigation monitoring for delisting occurred during Event 50. Water column toxicity sampling occurred during all events. In addition, the year eight samples were analyzed for a suite of constituents (general chemistry, general nutrients, metals, PCBs, OC pesticides, OP pesticides, and pyrethroid pesticides), particle size distribution, and total organic carbon.

SAMPLING SITES

The QAPP details the justification and rationale for each of the sites sampled via the CCWTMP. Information on compliance monitoring sites and land use sites sample collection frequency is presented in Table 4 and Table 5, respectively. The general locations of the receiving water compliance monitoring sites (excluding Mugu Lagoon) for water, sediment, and fish tissue are presented in Figure 2 through Figure 4. The POTW effluent discharge sites are presented in Figure 5. The sampling sites in each figure are designated by sampled constituent group. The compliance monitoring sampling zones for sediment sampling and tissue sampling in Mugu Lagoon are shown in Figure 6 and Figure 7, respectively.

The non-Mugu Lagoon water and sediment toxicity investigation sampling sites coincide with current and previous sampling programs in the CCW. Water and sediment toxicity investigation sampling sites and sampling frequency are presented in Table 6, while the general locations of the water and sediment toxicity investigation sampling sites in the CCW are presented in Figure 8. Land use monitoring sites are shown in Figure 9.

The salt monitoring sites correspond with compliance sites or land use sites used for monitoring related to other TMDLs (Figure 2) with two exceptions:

1. One of the salt compliance points is only used for salt monitoring (Conejo Creek at Baron Brothers Nursery).
2. The continuous monitoring equipment (and the location of monthly salt grab samples) for the Simi subwatershed was installed just downstream of the Tierra Rejada bridge, and is referred to as “07_TIERRA”.

The CCWTMP efforts summarized in the annual report correspond to the sites and locations listed below. As this program progresses, the number and location of sites may be revised if existing sites become inaccessible, if it is determined that alternative locations are needed, or if the number of land use stations needed to appropriately characterize discharges needs modification.

Table 4. CCWTMP Compliance Monitoring and Nutrient Investigation Sites Annual Sampling Frequency

Sub-Wat.	Site Id	Reach	Site Location	GPS Coordinates		Water ^{1, 2}						Sediment			Tissue ³	
				Lat	Long	Tox	Pests/PCBs	Nut	Metal	Salts	GWQC	Tox	Pests/PCBs	Metal	Pests/PCBs	Metal ⁴
Mugu Lagoon	01_RR_BR	1	Ronald Reagan St Bridge	34.1090	-119.0916	6	6	6	6	NA	6	NA	NA	NA	NA	NA
	01_BPT_3	1	Located In Eastern Arm	General site locations are provided as each site represents a generalized sample collection zone in which a sample will be collected.		NA	NA	NA	NA	NA	NA	Once Every Three Years				
	01_BPT_6	1	Located In Eastern Part Of Western Arm			NA	NA	NA	NA	NA	NA					
	01_BPT_14	1	Located In The Central Part Of The Western Arm			NA	NA	NA	NA	NA	NA					
	01_BPT_15	1	Located Between Estuary and Mouth of Lagoon			NA	NA	NA	NA	NA	NA					
	01_SG_74	1	Located In Western Part of Central Lagoon			NA	NA	NA	NA	NA	NA					
	Central Lagoon	1	Sampled In Central Lagoon			NA	NA	NA	NA	NA	NA				Once Every Three Years	
	Western Arm	1	Sampled In Western Arm Of The Lagoon			NA	NA	NA	NA	NA	NA					
Revolon Slough	04_WOOD ⁵	4	Revolon Slough East Side Of Wood Road	34.1698	-119.0958	6	6	6	6	6	6	1	1	NA	1	1
	05_CENTR	5	Beardsley Wash at Central Avenue	34.2300	-119.1128	NA	NA	6	NA	NA	6	NA	NA	NA	NA	NA
Calleguas	02_PCH	2	Calleguas Creek NE Side of Hwy 1 Bridge	34.1119	-119.0818	NA	NA	4	NA	NA	4	NA	NA	NA	NA	NA
	03_UNIV	3	Calleguas Creek At Camarillo Street	34.1795	-119.0399	6	6	6	6	6	6	1	1	NA	1	NA
	03D_CAMR ⁶	3	Camrosa Water Reclamation Plant	34.1679	-119.0530	4	4	4	4	4	4	NA	NA	NA	NA	NA
	9A_HOWAR ⁷	9B ⁷	Conejo Creek At Howard Road Bridge	34.1931	-119.0025	NA	NA	6	NA	6	NA	NA	NA	NA	NA	NA
	9AD_CAMA ⁷	9B ⁷	Camarillo Water Reclamation Plant	34.1938	-119.0017	4	4	4	4	4	4	NA	NA	NA	NA	NA
Conejo	9B_ADOLF ⁷	9A ⁷	Conejo Creek At Adolfo Road	34.2137	-118.9894	6	6	6	NA	NA	6	NA	1	NA	1	NA
Conejo	10_GATE	10	Conejo Creek Hill Canyon Below N Fork	34.2178	-118.9281	NA	NA	6	NA	NA	6	NA	NA	NA	NA	NA

Sub-Wat.	Site Id	Reach	Site Location	GPS Coordinates				Water ^{1, 2}				Sediment				Tissue ³	
				Lat	Long	Tox	Pests/ PCBs	Nut	Metal	Salts	GWQC	Tox	Pests/ PCBs	Metal	Pests/ PCBs	Metal ⁴	
	10D_HILL	10	Hill Canyon Wastewater Treatment Plant	34.2113	-118.9218	4	4	4	4	4	4	NA	NA	NA	NA	NA	
	12_PARK	12	Conejo Creek North Fork above Hill Canyon	34.2144	-118.915	NA	NA	4	NA	NA	4	NA	NA	NA	NA	NA	
	13_BELT	13	Conejo Creek S Fork Behind Belt Press Building	34.2078	-118.9194	NA	NA	4	NA	NA	4	NA	NA	NA	NA	NA	
	9B_BARON ⁷	9A ⁷	Conejo Creek at Baron Brothers Nursery	34.2365	-118.9643	NA	NA	NA	NA	6	NA	NA	NA	NA	NA	NA	
	Las Posas	06_SOMIS ⁸	6	Arroyo Las Posas off Somis Road	34.2540	-118.9925	6	6	6	NA	NA	6	NA	1	NA	1	NA
06D_MOOR ⁶		6	Ventura County Wastewater Treatment Plant	34.2697	-118.9357	4	4	4	4	4	4	NA	NA	NA	NA	NA	
Arroyo Simi	07_HITCH	7	Arroyo Simi East Of Hitch Boulevard	34.2716	-118.9234	6	6	6	NA	NA	6	NA	1	NA	1	NA	
	07_TIERRA	7	Arroyo Simi downstream from Tierra Rejada Blvd.	34.2701	-118.9058	NA	NA	NA	NA	6	NA	NA	NA	NA	NA	NA	
	07_MADER	7	Arroyo Simi at Madera Ave.	34.2778	-118.7958	NA	NA	6	NA	NA	6	NA	NA	NA	NA	NA	
	07D_SIMI	7	Simi Valley Water Quality Control Plant	34.2848	-118.8128	4	4	4	4	4	4	NA	NA	NA	NA	NA	

NA – Not Analyzed

Tox – Samples will be analyzed for toxicity and OP and pyrethroid pesticides as listed in Table 2. Toxicity in water will not be analyzed at 01_RR_BR or at the POTWs.

Pests/PCBs – Samples will be analyzed for OC pesticides and PCBs as listed in Table 2. Chlorpyrifos will be analyzed in tissue at 04_WOOD as it is on the 303(d) list for this reach.

Nut – Samples will be analyzed for Nutrients as listed in Table 2.

Metal – Samples will be analyzed for Metals as listed in Table 2.

GWQC – Samples will be analyzed for General Water Quality Constituents as listed in Table 2.

1. Sites listed for 6 sampling events per monitoring year refers to 4 quarterly dry events and the attempt to sample 2 additional wet events.
2. Grab samples for salts at compliance sites are not directly used to determine compliance with salts WQOs, but are used to develop statistical relationships between EC and salt constituents (Appendix C).
3. Tissue samples will be collected in the same location as water and sediment samples. Samples may be collected elsewhere if no fish are found at pre-established sample stations.
4. Bird egg samples will be collected and analyzed for mercury and selenium in the Mugu Lagoon subwatershed.
5. TIEs will not be performed at 04_WOOD.
6. The Camrosa Water Reclamation Plant and the Ventura County Wastewater Treatment Plant are not currently discharging. However, these sites are included in case they must be sampled at a later date.
7. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.
8. In Year 8, sampling crews were not able to access the 06_SOMIS site for the majority of the year. An alternative site downstream has been chosen to replace the 06_SOMIS site.

Table 5. CCWTMP Land Use Monitoring Sites and Sample Frequency

Sub-Wat.	Site ID	Reach	Site Type ¹	Site Location	GPS Coordinates		Pests/PCBs	Nutrients	Metal	Salts	GWQC
					Lat	Long					
Mugu Lagoon	01T_ODD2_DCH	1	Ag	Duck Pond/Mugu/Oxnard Drain #2 S. of Hueneme Rd	34.1395	-119.1185	6	6	6	NA	6
Revolon Slough	04D_WOOD	4	Ag	Agricultural Drain on E. Side of Wood Rd N. of Revolon	34.1708	-119.0963	6	6	6	6	6
	05D_SANT_VCWPD	5	Ag	Santa Clara Drain at VCWPD Gage 781 prior to confluence with Beardsley Channel	34.2426	-119.1137	6	6	6	NA	6
	04D_VENTURA	4	Urban	Camarillo Hills Drain at Ventura Blvd and Las Posas Rd at VCWPD Gage 835	34.2162	-119.0685	6	NA	6	6	6
Calleguas	02D_BROOM	2	Ag	Discharge to Calleguas Creek at Broome Ranch Rd.	34.1433	-119.0713	6	6	6	NA	6
Conejo	9BD_GERRY ²	9A ²	Ag	Drainage ditch crossing Santa Rosa Rd at Gerry Rd	34.2358	-118.9446	6	6	6	6	6
	9BD_ADOLF ²	9A ²	Urban	Urban storm drain passing under N. side of Adolfo Rd approximately 300 meters from Reach 9B	34.2148	-118.9951	6	NA	6	6	6
	13_SB_HILL	13	Urban	South Branch Arroyo Conejo on S. Side of W Hillcrest	34.1849	-118.9075	6	NA	NA	6	6
Las Posas	06T_FC_BR	6	Ag	Fox Canyon at Bradley Rd - just north of Hwy 118	34.2646	-119.0111	6	6	NA	NA	6
Arroyo Simi	07D_HITCH_LEVEE_2	7	Ag	2 nd corrugated pipe discharging on north side of Arroyo Simi flood control levee off of Hitch Blvd just beyond 1 st power pole.	34.2716	-118.9219	6	6	NA	6	6
	07D_MPK ³	7	Urban	Gabbert Canyon Drain, N. side of 118	34.2790	-118.9056	6	NA	NA	6	6
	07D_SIM_BUS ⁴	7	Urban	Bus Canyon Dr N. of 5 th St and LA Ave intersection	34.2719	-118.7837	6	NA	NA	NA	6

Ag = Agricultural Land Use Site Urban = Urban Land Use Site NA – Not Analyzed

1. Specific constituents analyzed under each category are listed in Table 2.

2. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.

3. Site 07D_MPK replaces 07D_CTP to correspond with the Moorpark MS4 outfall sampling location.

4. Site 07D_SIM_BUS replaces 07T_DC_H to correspond with the Simi Valley MS4 outfall sampling location.

Table 6. Toxicity Investigation Monitoring Sites and Sampling Frequency

				GPS Coordinates				
Subwatershed	Site ID	Reach	Site Location	Lat	Long	Tox	Pests/PCBs	GWQC
<i>Sediment Toxicity Investigation</i>¹								
Calleguas	02_PCH	2	Calleguas Creek Northeast Side Of Highway 1 Bridge	34.1119	-119.0818	1	1	1
	9A_HOWAR ²	9B ²	Conejo Creek At Howard Road Bridge	34.1931	-119.0025	1	1	1
<i>Water Toxicity Investigation</i>^{1, 3}								
Conejo	10_GATE	10	Conejo Creek Hill Canyon Below North Fork Of Conejo Creek	34.2178	-118.9281	6	6	6
	13_BELT	13	Conejo Creek South Fork Behind Hill Canyon Belt Press Building	34.2078	-118.9194	6	6	6

Tox – Samples will be analyzed for toxicity, OP, and pyrethroid pesticides in water and toxicity, OP, and pyrethroid pesticides in sediment as listed in Table 2.

Pests/PCBs – Samples will be analyzed for OC pesticides and PCBs as listed in Table 2.

GWQC – Samples will be analyzed for General Water Quality Constituents as listed in Table 2.

1. This table depicts the normal toxicity investigation sampling frequency. During year 5, this investigation was put on hold and then re-started as described in text.
2. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.
3. Includes two wet events per site; except during years when there is insufficient rainfall to trigger sampling.

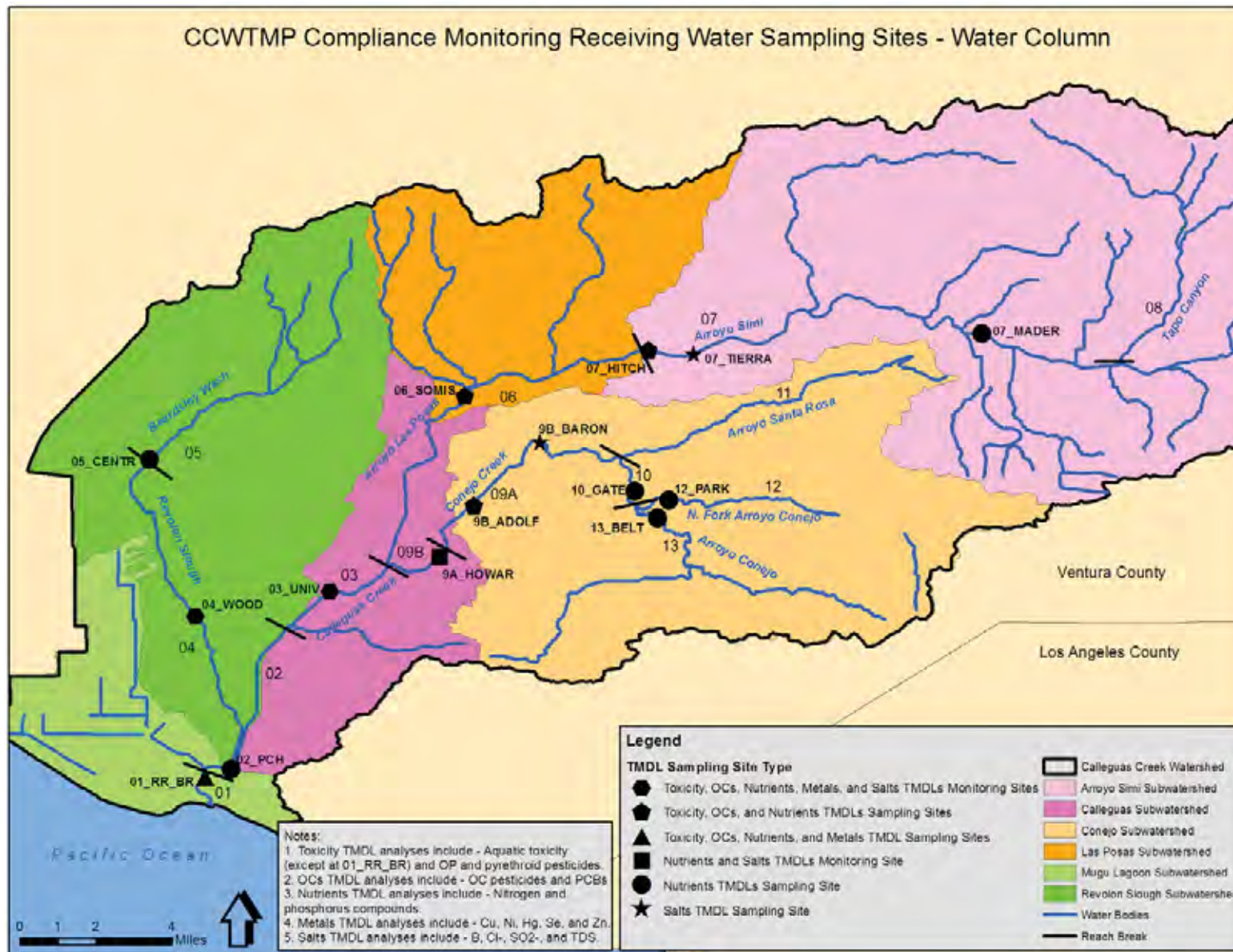


Figure 2. CCWTMP Compliance Monitoring Sampling Sites – Receiving Water

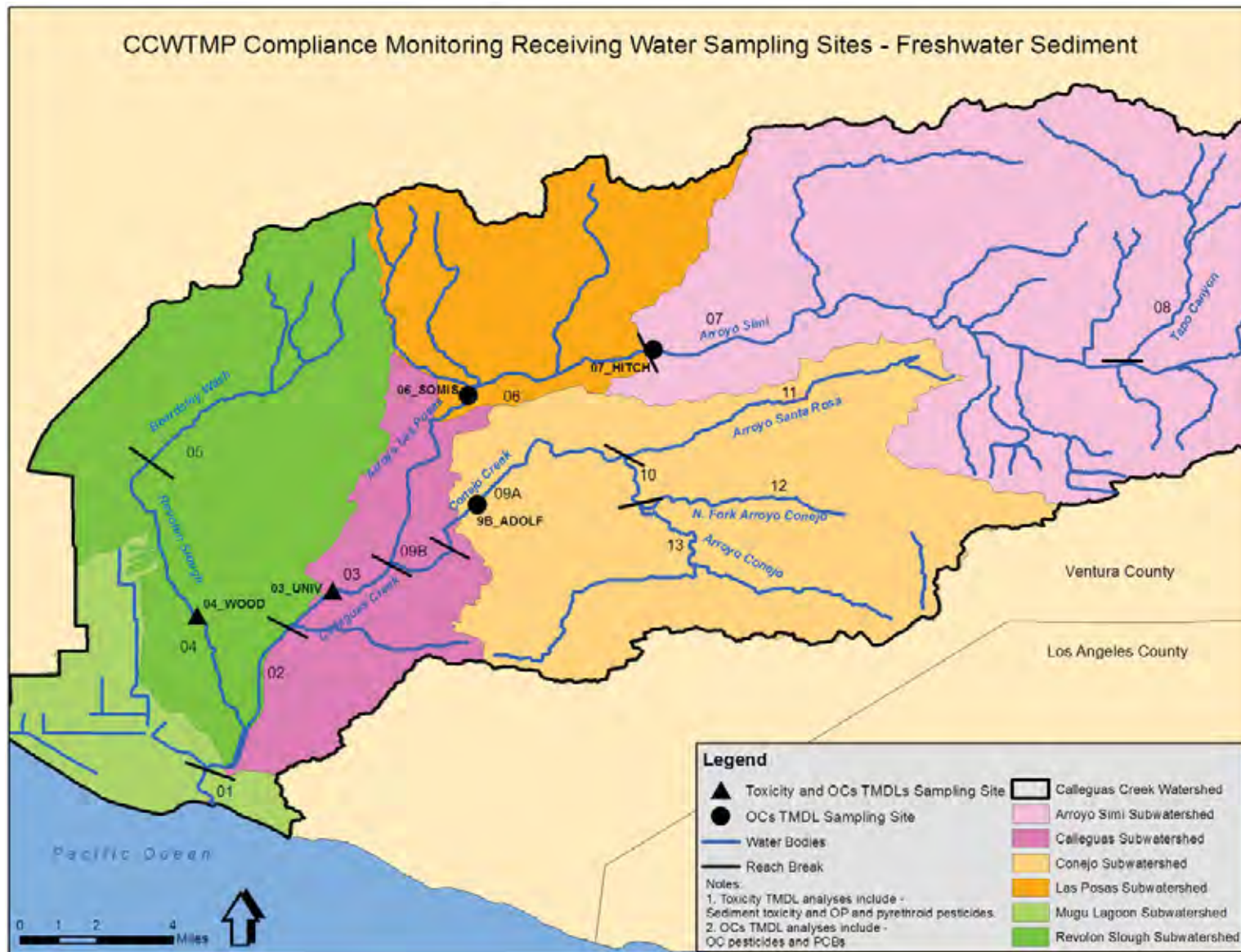


Figure 3. CCWTMP Compliance Monitoring Receiving Water Sampling Sites – Freshwater Sediment

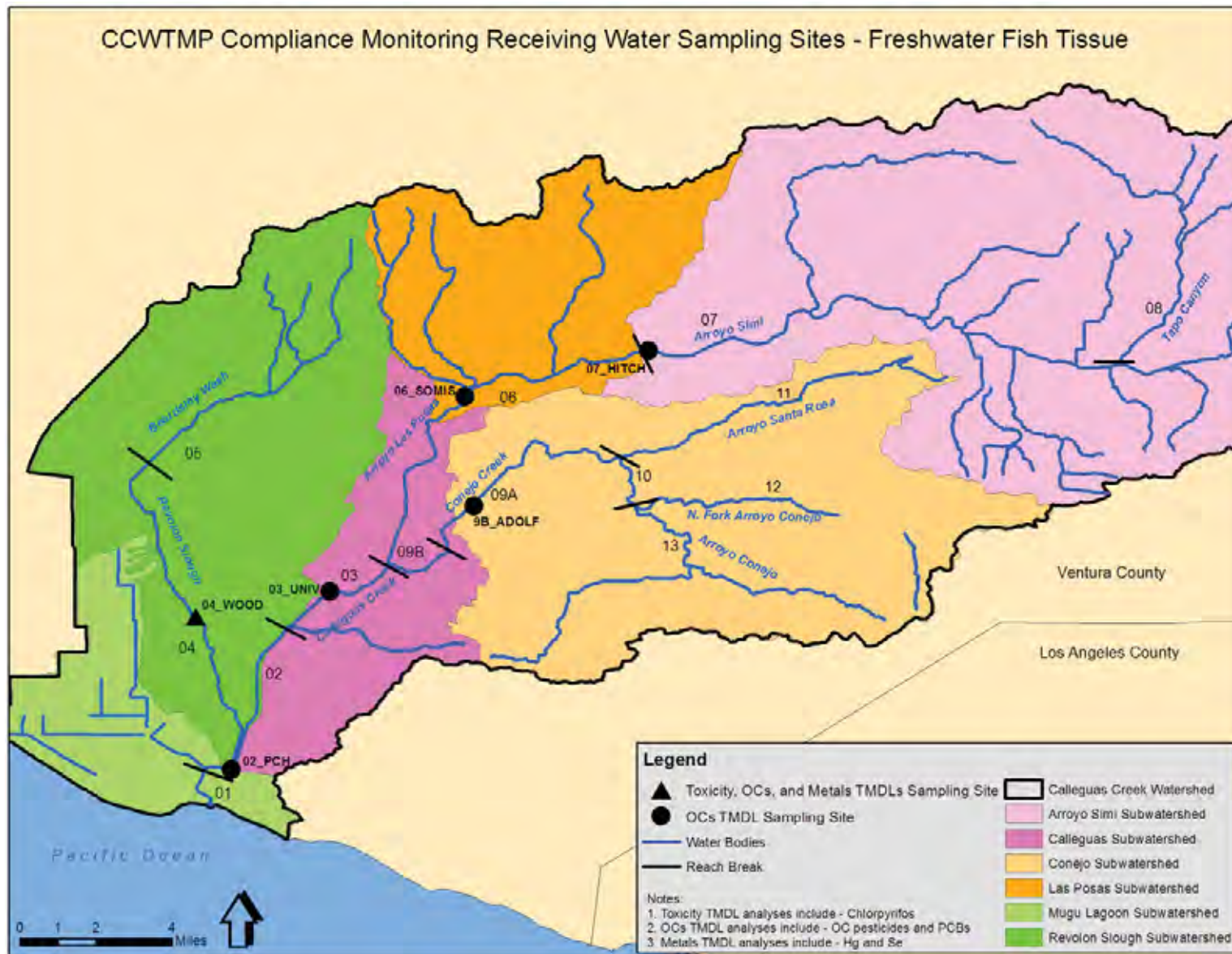


Figure 4. CCWTMP Compliance Monitoring Sampling Sites – Freshwater Fish Tissue

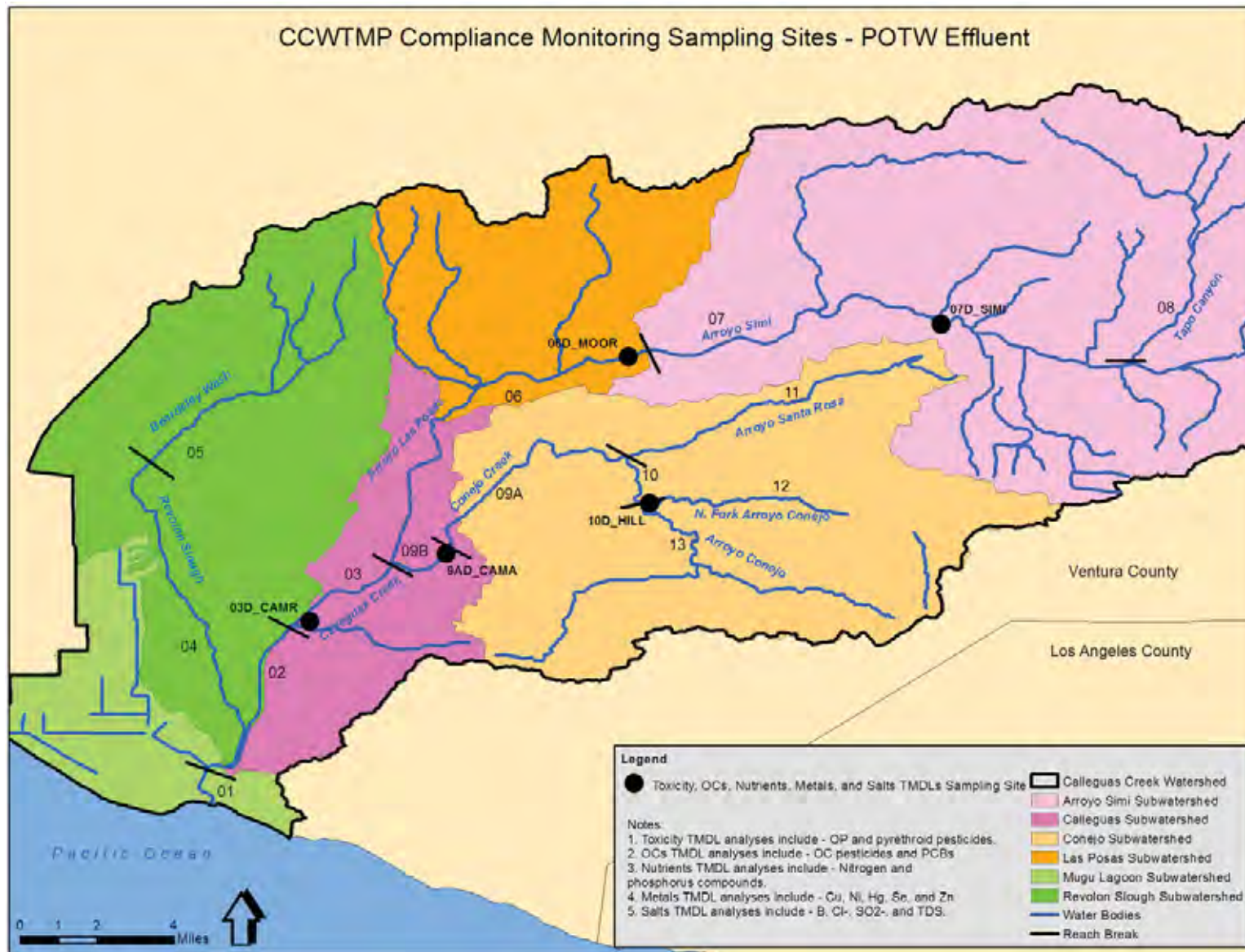


Figure 5. CCWTMP Compliance Monitoring Sampling Sites – POTW Effluent

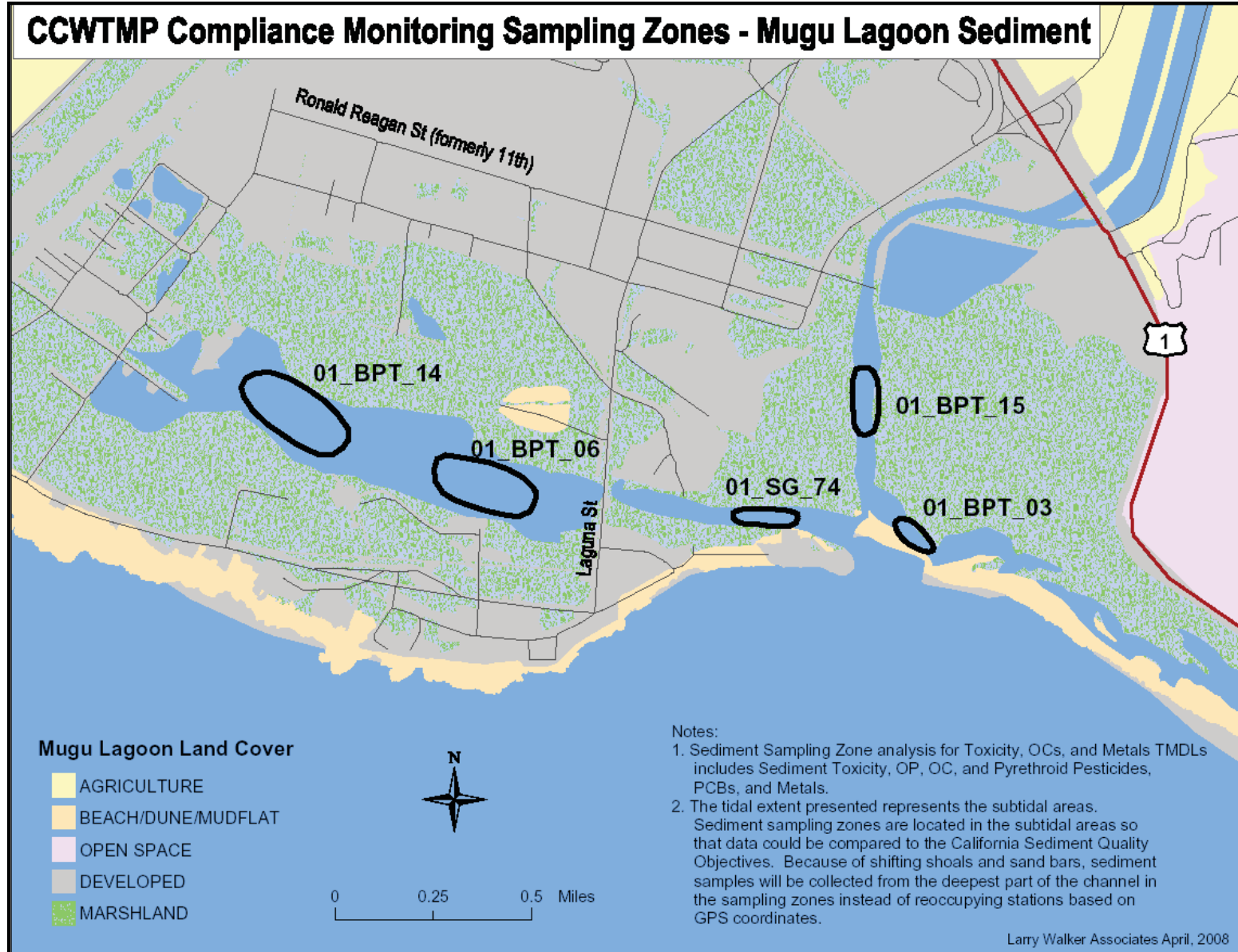


Figure 6. CCWTMP Compliance Monitoring Sampling Zones – Mugu Lagoon Sediment



Figure 7. CCWTMP Compliance Monitoring Sampling Zones – Mugu Lagoon Tissue

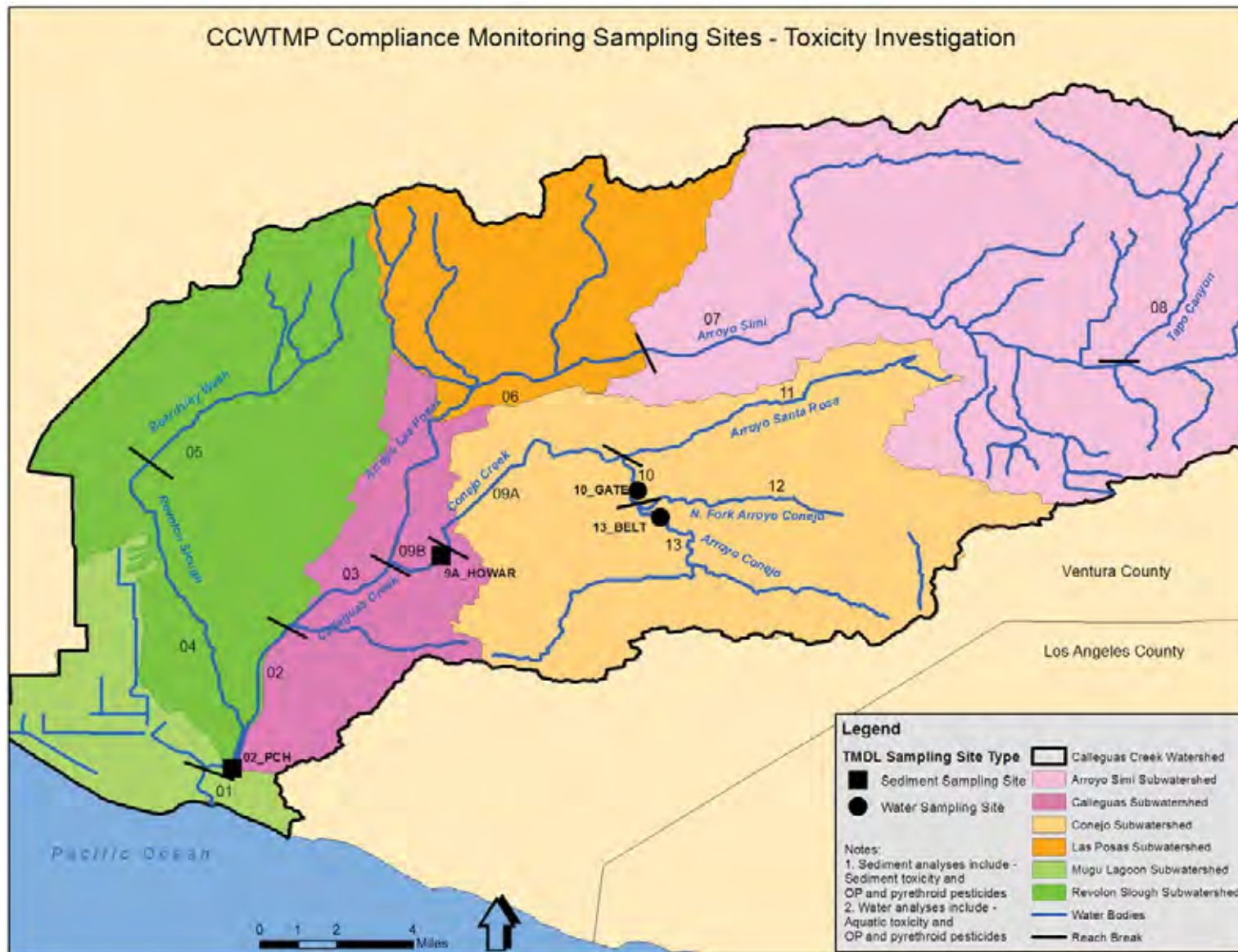


Figure 8. CCWTMP Toxicity Investigation Receiving Water Sampling Sites – Water and Sediment

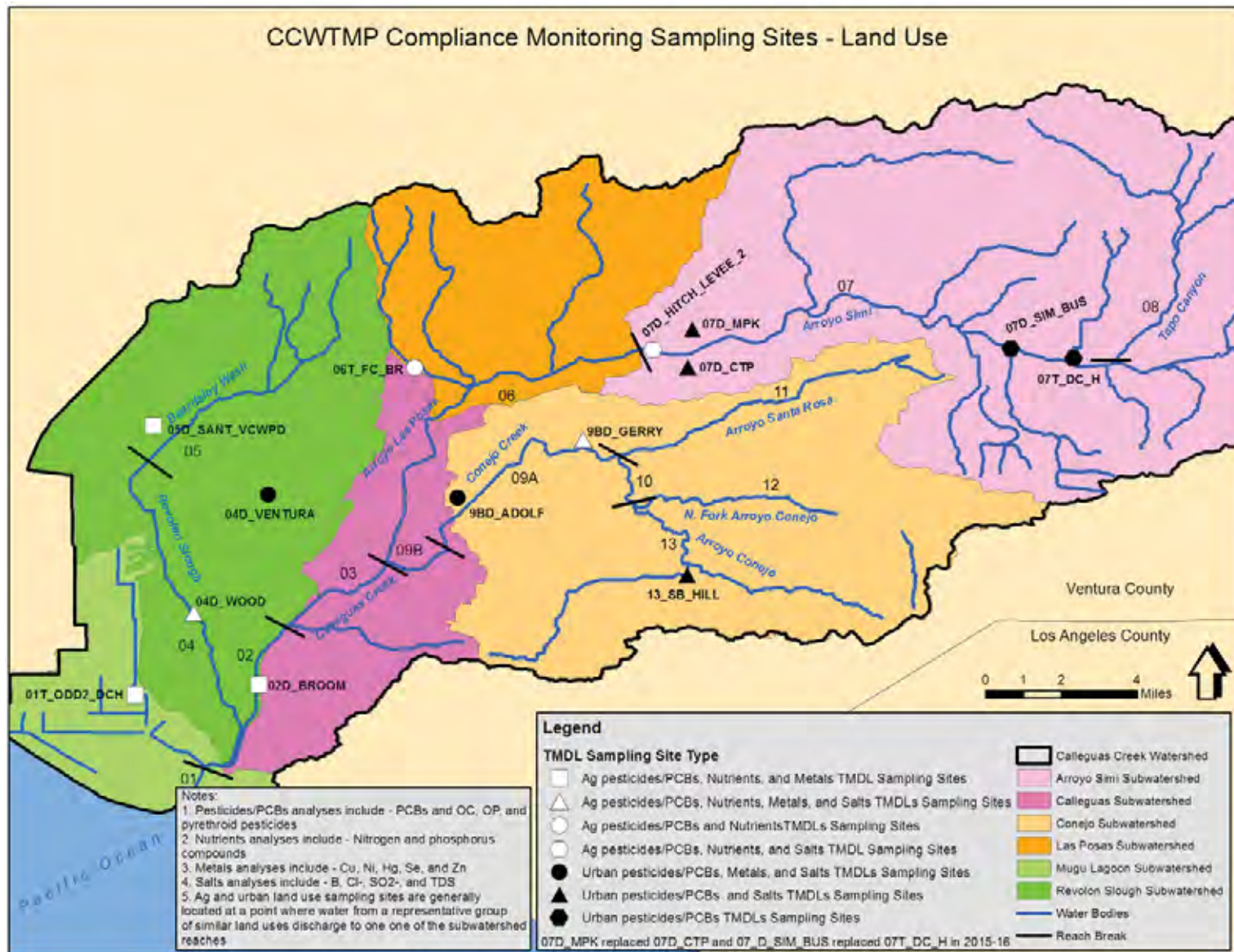


Figure 9. CCWTMP Land Use Sampling Sites

Monitoring Data Summary

To summarize the CCW TMDL monitoring data, box plots have been created for site and constituent combinations representing the data gathered over the entire monitoring program. The data presented includes all constituents with TMDL limits for water or sediment at the sites where the constituents were analyzed. Where TMDL limits are effective, those thresholds have been identified for the sites where they apply. As appropriate, data for constituents with specific dry or wet weather limits are presented separately. Data collected during year eight, which is the reporting period for this document, have been overlain on the box plots as circles. The box plots include all of the data collected during this program (2008-2016). This was done to allow for easy comparison between recent data and what have been collected overall. The eighth year data are presented in tabular form below each box plot. Each figure of box plots presents data from either receiving water sites or land use sites. The receiving water sites are color coded by subwatershed as shown in Table 7. Land use and POTW sites are displayed together and grouped by type as presented in Table 8.

Fish tissue data are not displayed as box plots. Fish tissue data are presented in tables due to the small number of samples and to preserve the species information associated with each sample.

Toxicity data and TIE results are summarized in Appendix D. Summaries of the 2015-16 monitoring events are included as Appendix A.

Some TMDL constituents were never, or rarely detected (less than 2 percent detection rate) and therefore, did not warrant a data summary. The constituents, which were never detected, include:

In Water:

- Endosulfan II
- Endrin

In Sediment:

- Endrin
- BHC, gamma

Rarely detected constituents in water are as follows:

- Aldrin (four detects, none this year)
- Dieldrin (eight detects, two this year)
- Endosulfan I (three detects, none this year)
- BHC, gamma (three detects, none this year)
- Total PCBs (five detects, three this year)

Rarely detected constituents in sediment are as follows:

- Dieldrin (one detect, none this year)

Table 7. Receiving Water Sites Color Coded by Subwatershed

Subwatershed	Reach	Site ID
Mugu Lagoon	Reach 1	01_BPT_14
		01_BPT_15
		01_BPT_3
		01_BPT_6
		01_RR_BR
		01_SG_74
Calleguas	Reach 2	02_PCH
	Reach 3	03_UNIV
	Reach 9B ¹	9A_HOWAR
Revolon Slough	Reach 4	04_WOOD
	Reach 5	05_CENTR
Las Posas	Reach 6 ²	06_SOMIS
Arroyo Simi	Reach 7	07_HITCH
		07_MADER
		07_TIERRA
Conejo	Reach 9A ¹	9B_ADOLF
	Reach 9A ¹	9B_BARON
	Reach 10	10_GATE
	Reach 12	12_PARK
	Reach 13	13_BELT

1. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.
2. In Year 8, sampling crews were denied access to the 06_SOMIS site for four out of six sampling events. The site has been moved downstream where crews can access the receiving water without needing private landowner permissions.

Table 8. Land Use and POTW Sites Color Coded by Type

Urban Land Use (MS4) Sites:	
Reach 4	04D_VENTURA
Reach 7	07D_CTP
Reach 7 ¹	07D_MPK ¹
Reach 7	07T_DC_H
Reach 7 ¹	07D_SIM_BUS ¹
Reach 9A ²	9BD_ADOLF ²
Reach 13	13_SB_HILL

Ag Land Use Sites:	
Reach 1	01T_ODD2_DCH
Reach 2	02D_BROOM
Reach 4	04D_WOOD
Reach 5	05D_SANT_VCWPD
Reach 6	06T_FC_BR
Reach 7	07D_HITCH_LEVEE_2
Reach 9A ²	9BD_GERRY ²

POTW Sites:	
Reach 7	07D_SIMI
Reach 9B ²	9AD_CAMA ²
Reach 10	10D_HILL

1. In the 2014 updates to the QAPP, the 07D_MPK replaced the 07D_CTP site to be consistent with the Moorpark MS4 monitoring site and the 07D_SIM_BUS site replaced the 07T_DC_H site to be consistent with the Simi Valley MS4 monitoring site. For this transition monitoring year, past data from the original sites and current data from the new sites are both provided in the plots within the following sections
2. In the 2012 updates to the Los Angeles Region Basin Plan, the reach designations for 9A and 9B were switched. For consistency with the TMDLs and historic site naming conventions, the site names in the annual monitoring reports maintain the original reach designations.

OC PESTICIDES TMDL DATA SUMMARY

The following figures present OC pesticides data in both water and sediment. Presently, only the POTWs have effective final limits in water, but data for all sites is provided since the TMDL specifies final targets for OC pesticides in water. Effective interim allocations for agriculture and waste load allocations for urban dischargers are provided in the appropriate OC pesticides in sediment figures. Data collected during year eight, which is the reporting period for this document, have been overlain on the box plots as circles. The box plots include all of the data collected during this program (2008-2016). This was done to allow for easy comparison between recent data and what have been collected overall. The eighth year data are presented in tabular form below each box plot. Bolded values in the tables within each figure indicate the concentration was above the applicable limits for that constituent. Italicized values in the tables

within each figure indicate the concentration was detected but not quantifiable (DNQ). Values in the tables within each figure with a “<” preceding it, indicate the constituent was not detected (ND) at MDL for that constituent. Values identified as “--” in the tables indicate no samples were collected at those sites for those events.

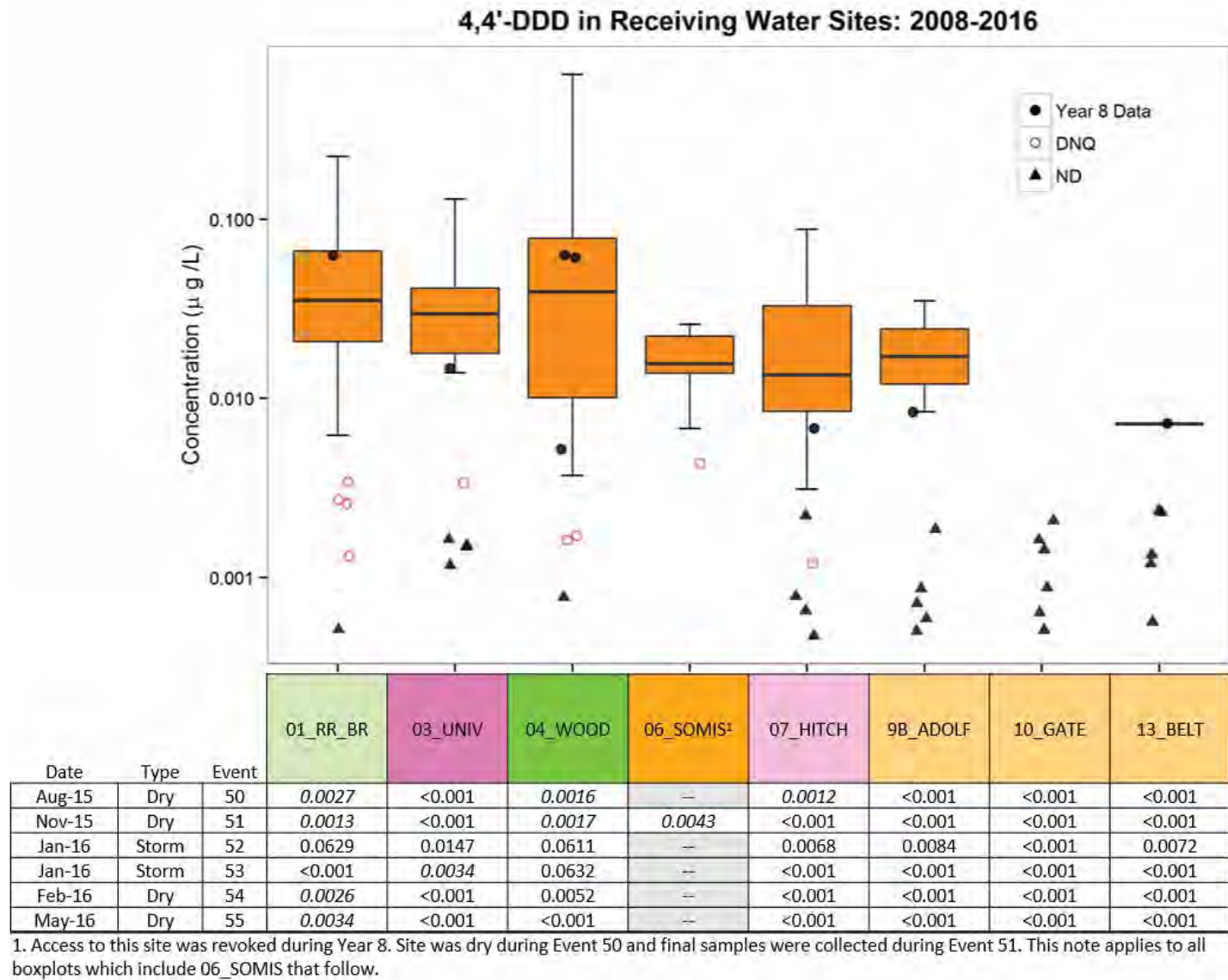


Figure 10. 4,4'-DDD Water Column Concentrations in Receiving Water Sites: 2008-2016

4,4'-DDD in Water from Urban, Ag, & POTW Sites: 2008-2016

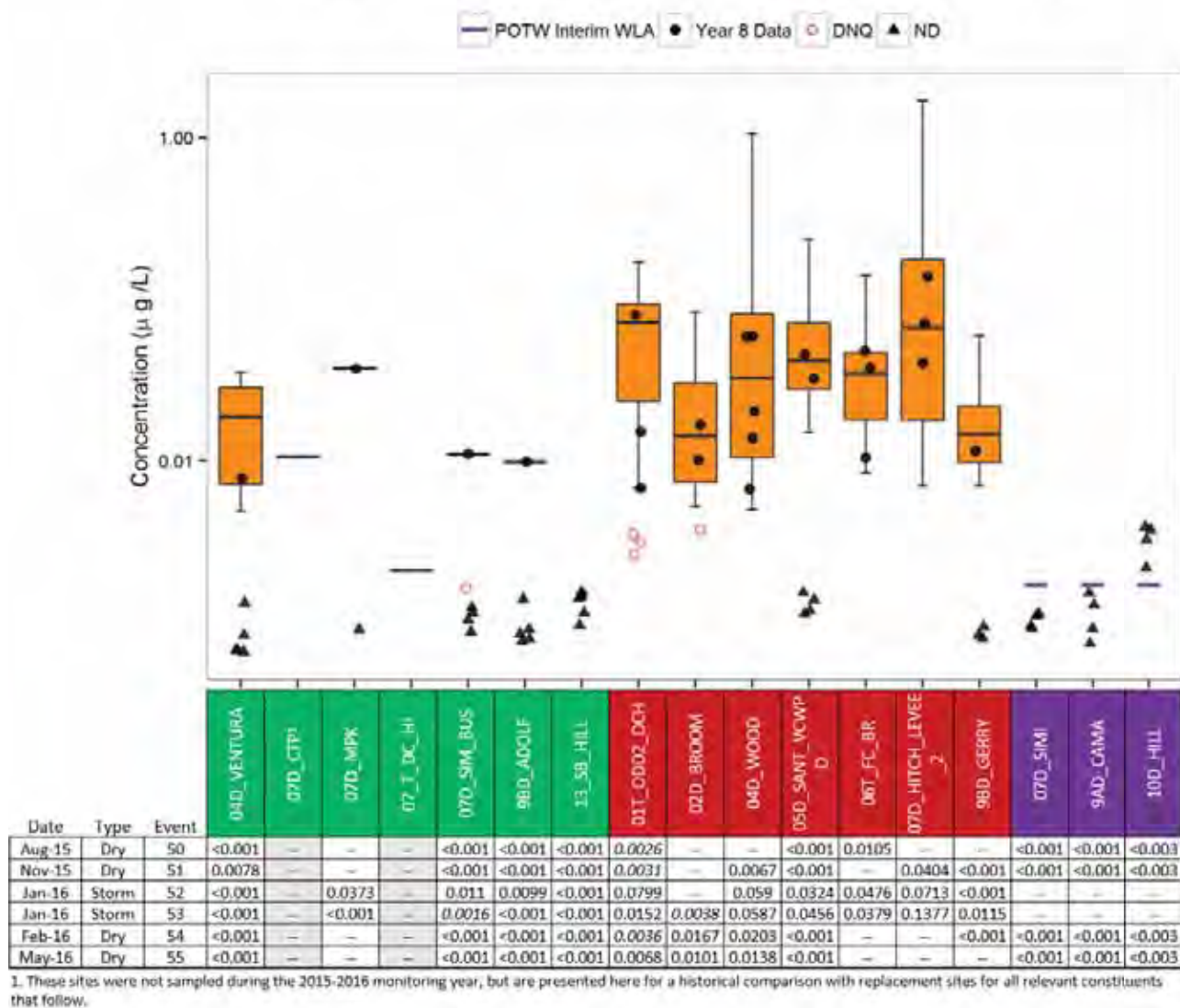


Figure 11. 4,4'-DDD Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2016

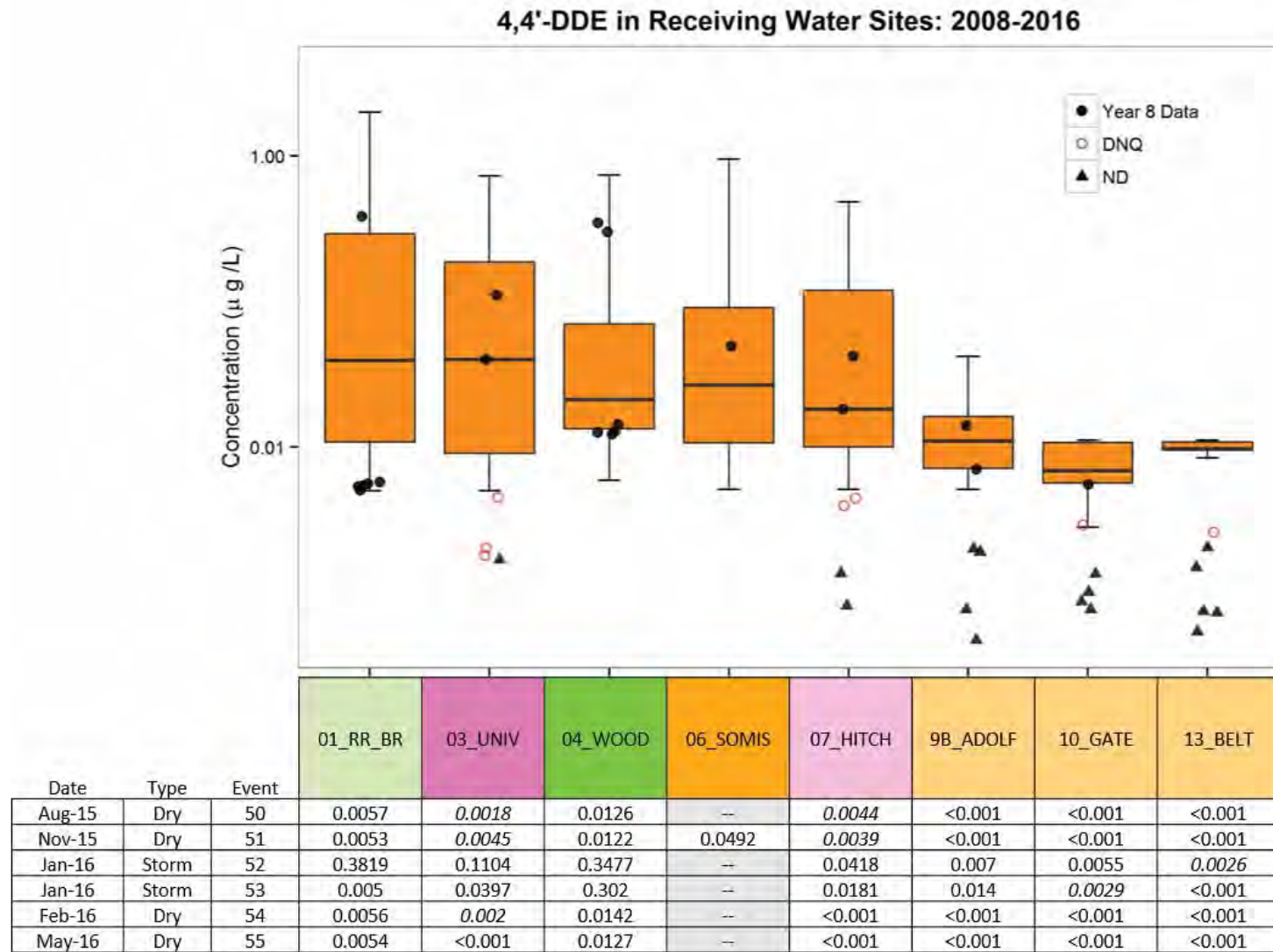


Figure 12. 4,4'-DDE Water Column Concentrations in Receiving Water Sites: 2008-2016

4,4'-DDE in Water from Urban, Ag, & POTW Sites: 2008-2016

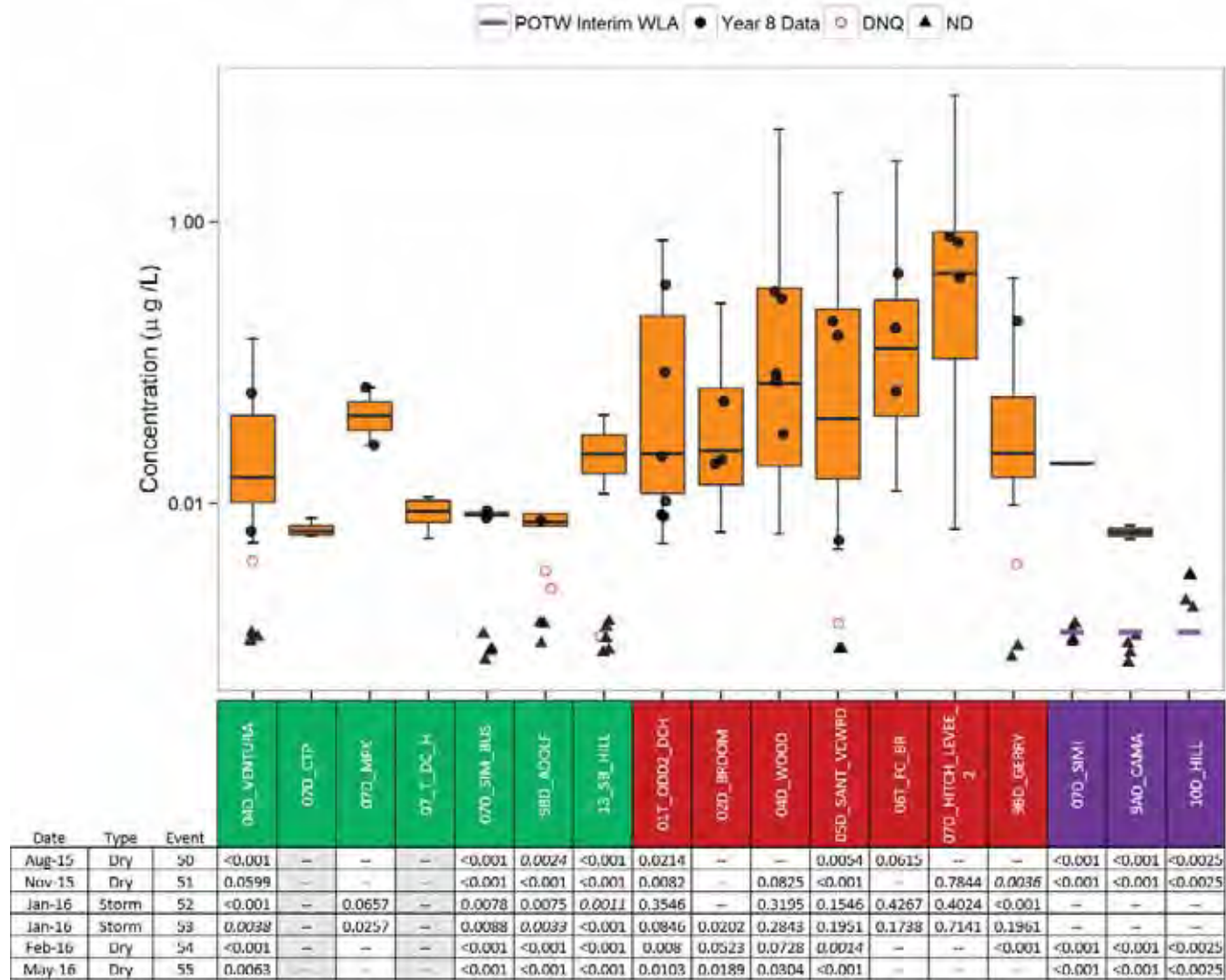


Figure 13. 4,4'-DDE Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2016

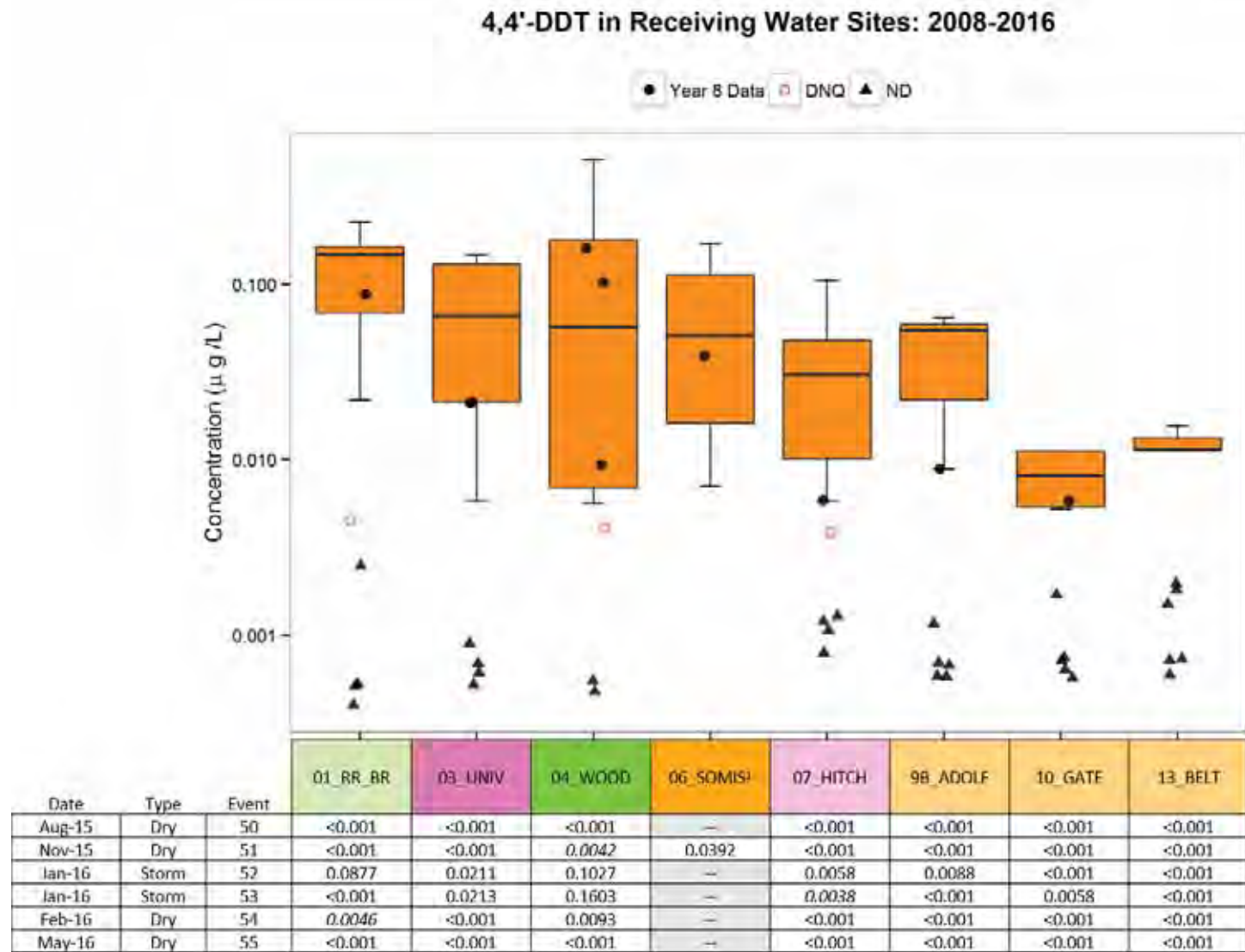


Figure 14. 4,4'-DDT Water Column Concentrations in Receiving Water Sites: 2008-2016

4,4'-DDT in Water from Urban, Ag, & POTW Sites: 2008-2016

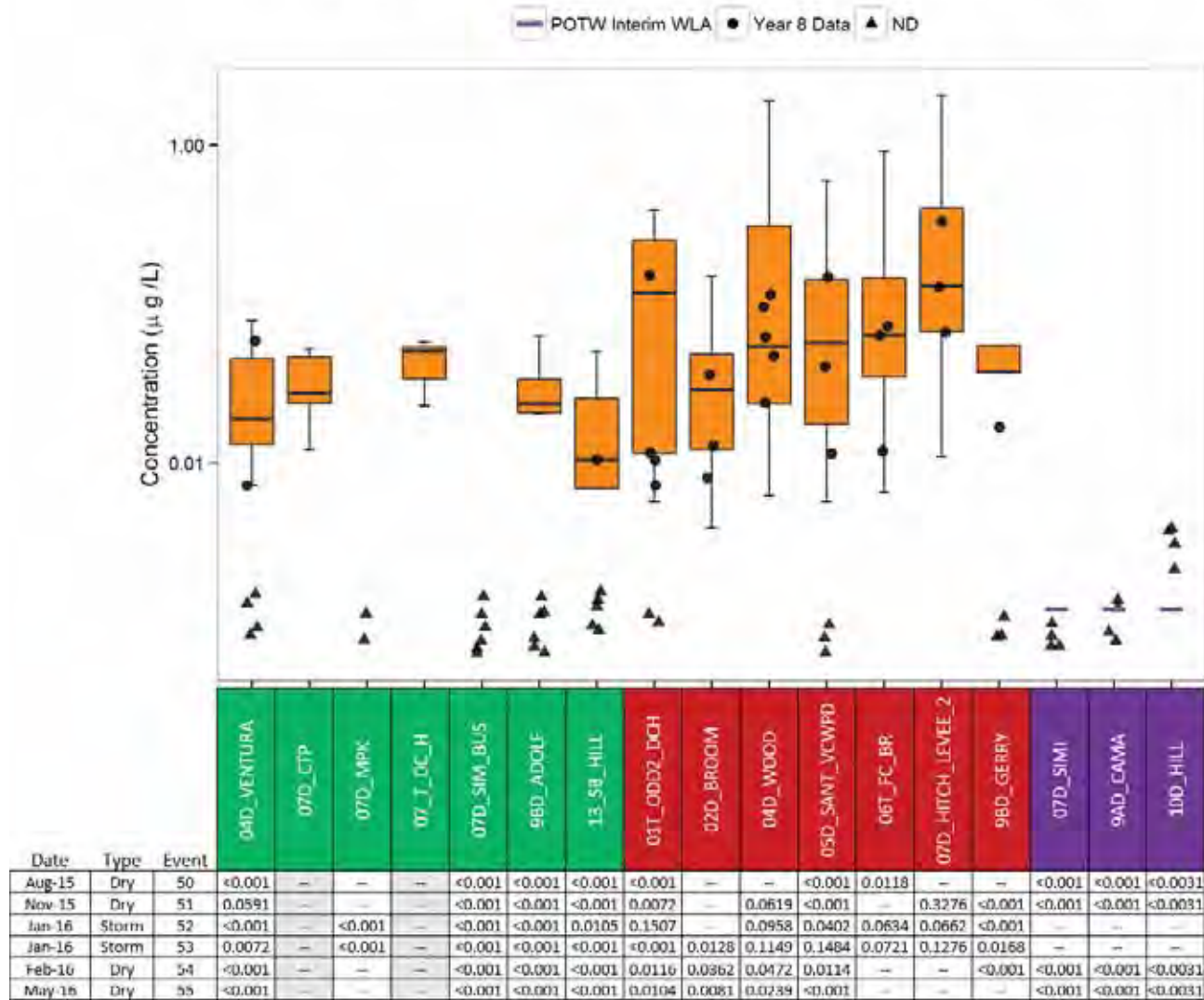


Figure 15. 4,4'-DDT Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2016

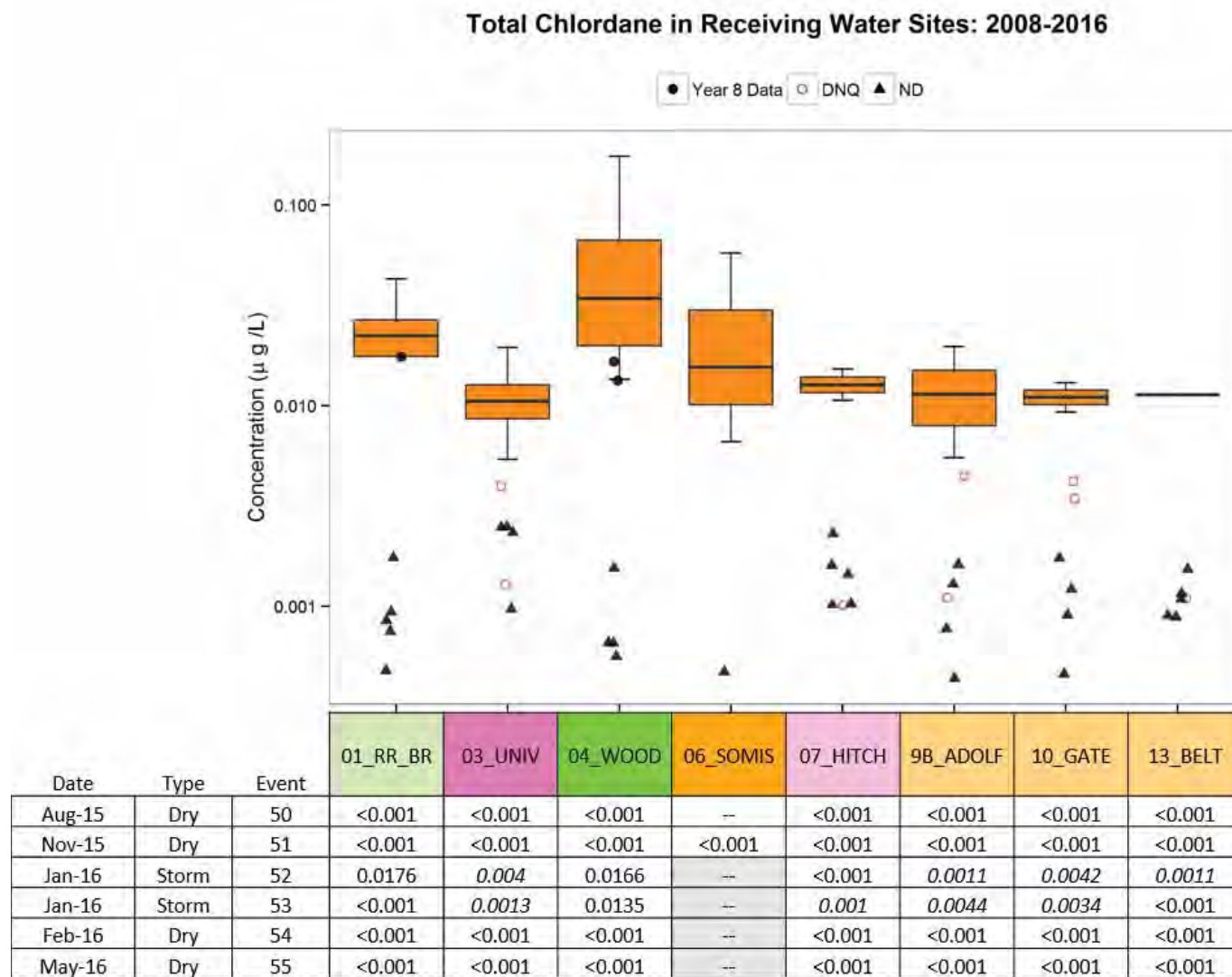


Figure 16. Total Chlordane Water Column Concentrations in Receiving Water Sites: 2008-2016

Total Chlordane in Water from Urban, Ag, & POTW Sites: 2008-2016

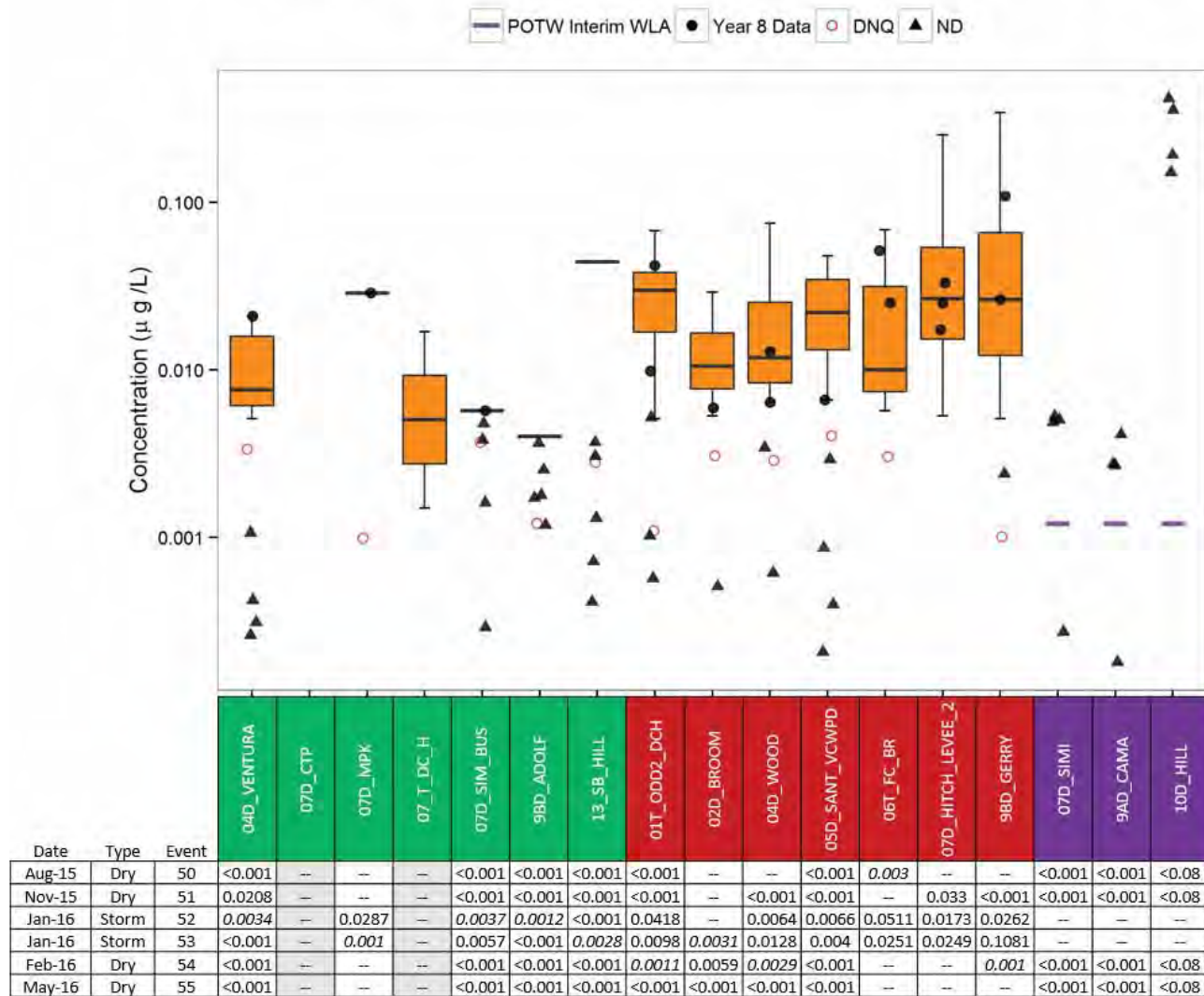


Figure 17. Total Chlordane Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2016

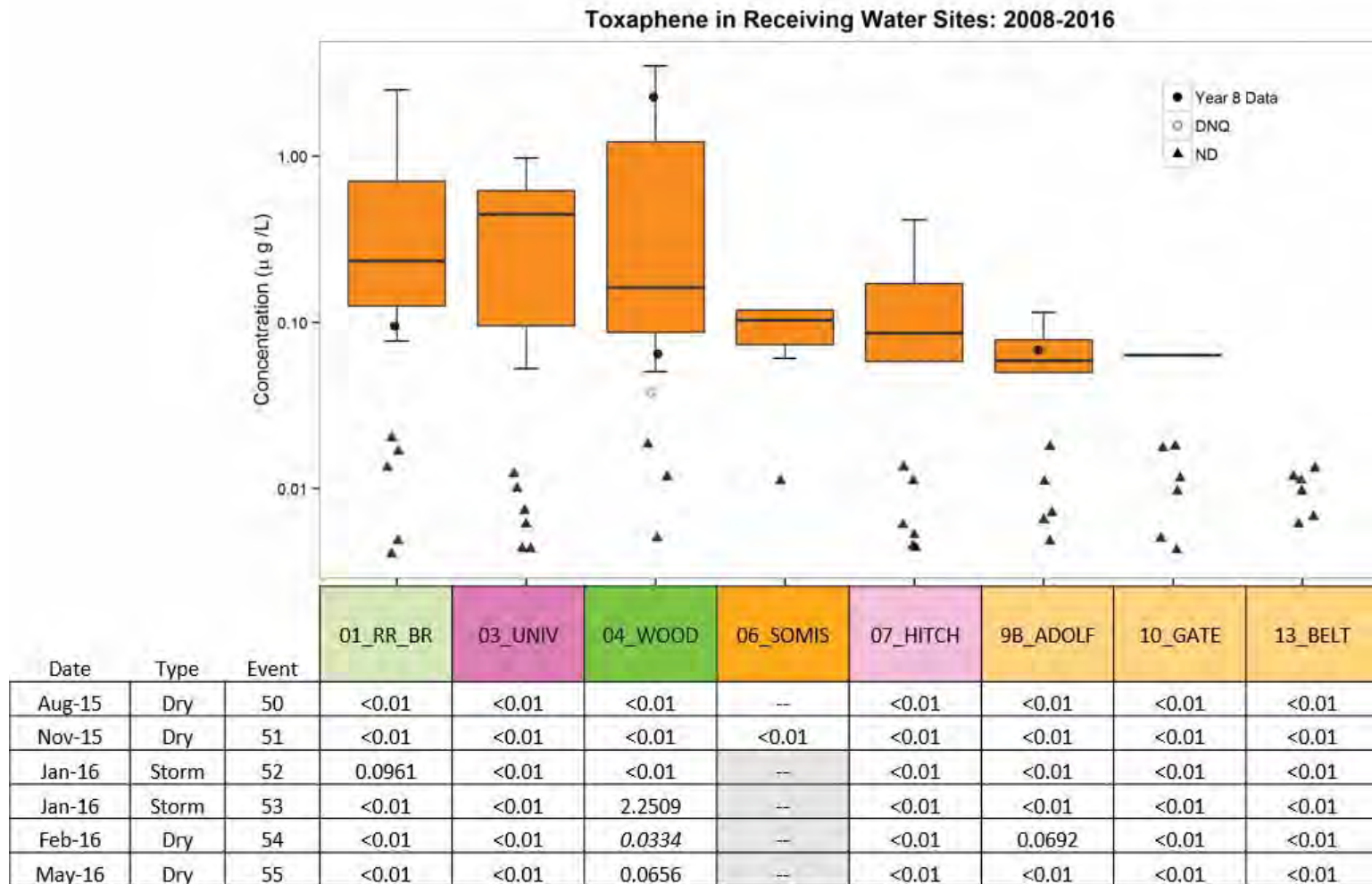


Figure 18. Toxaphene Water Column Concentrations in Receiving Water Sites: 2008-2016

Toxaphene in Water from Urban, Ag, & POTW Sites: 2008-2016

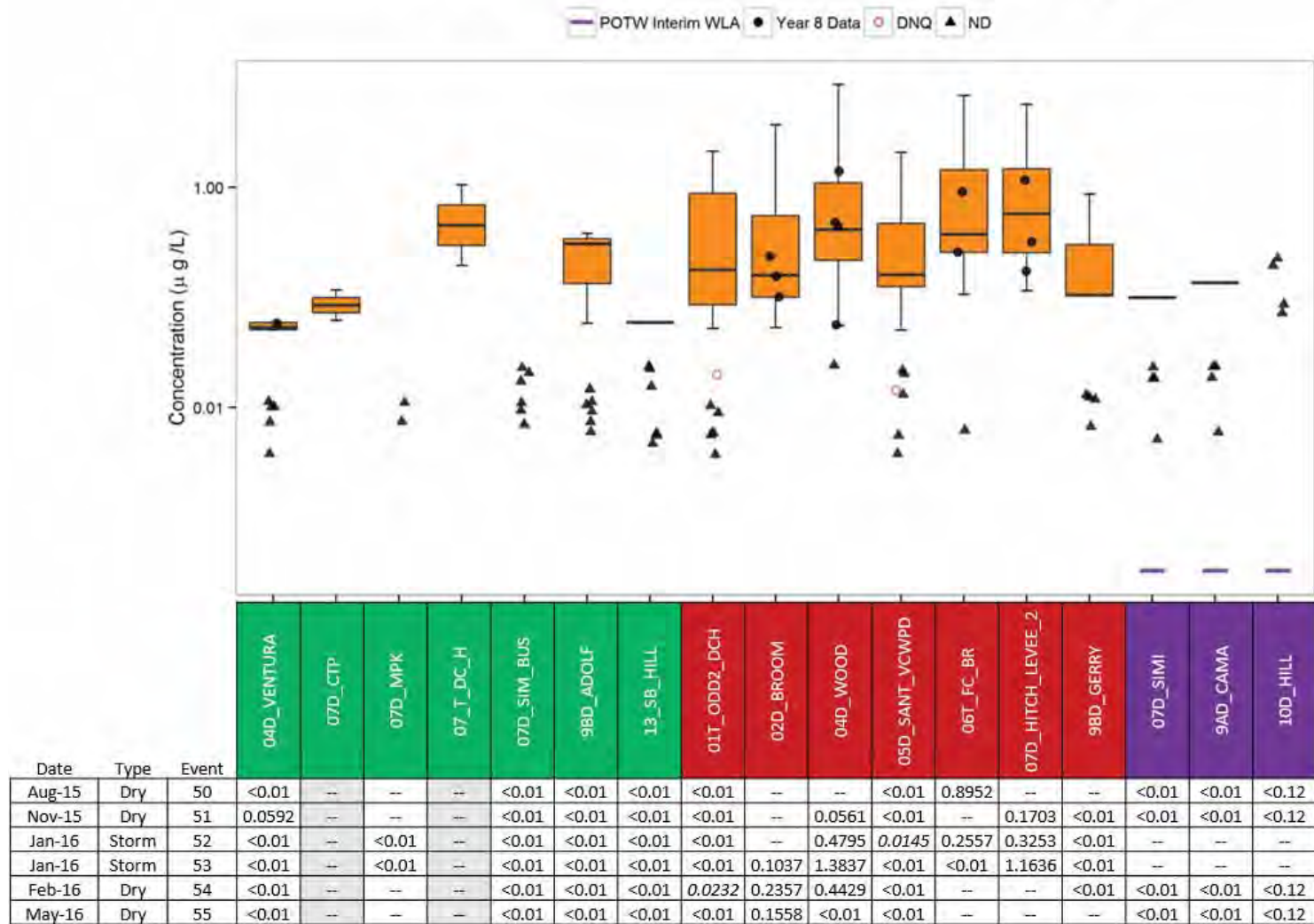


Figure 19. Toxaphene Water Column Concentrations in Urban, Ag, and POTW Sites: 2008-2016

4,4'-DDD in Sediment Sites: 2008-2016

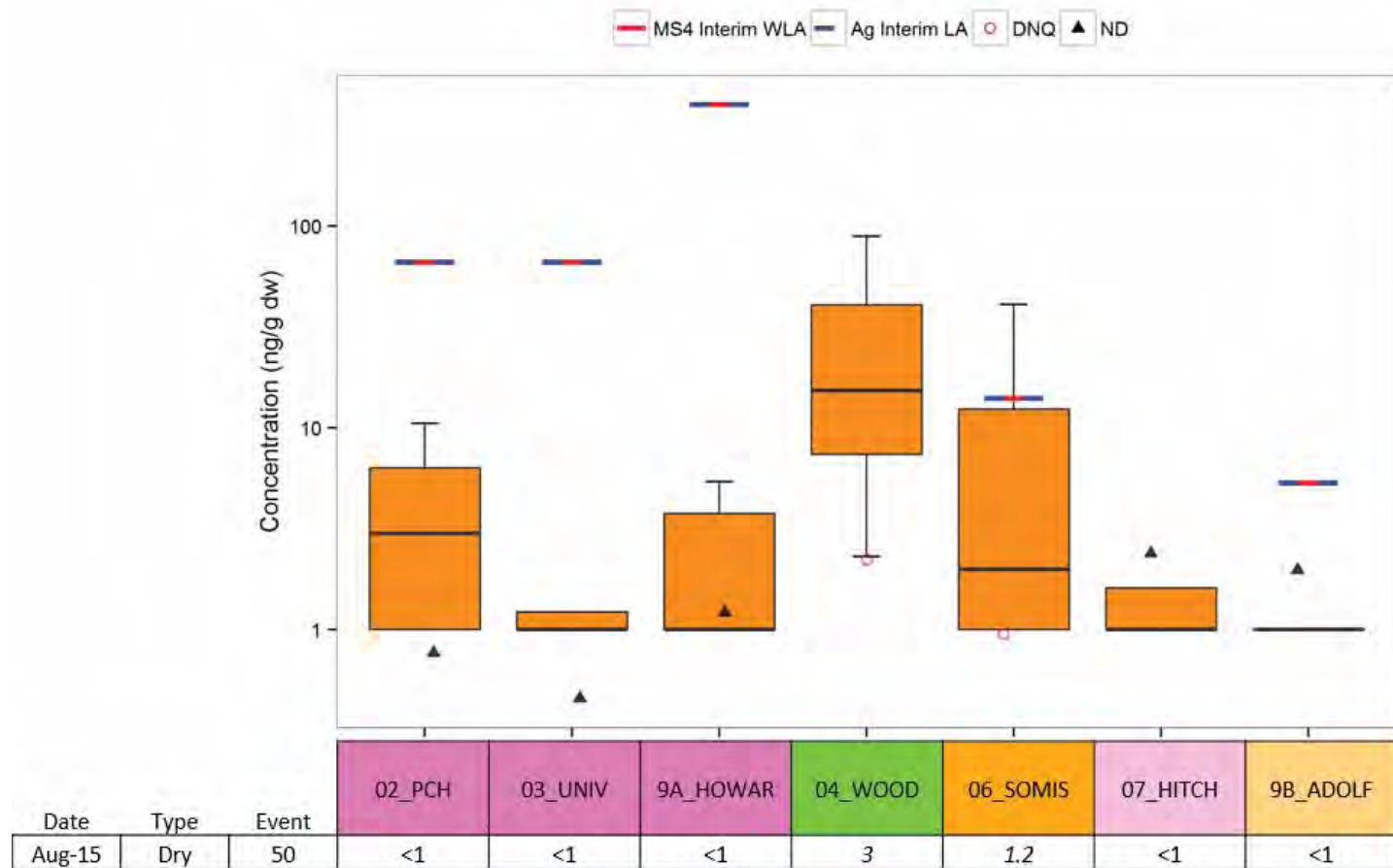


Figure 20. 4,4'-DDD Sediment Concentrations in Receiving Water Sites: 2008-2016

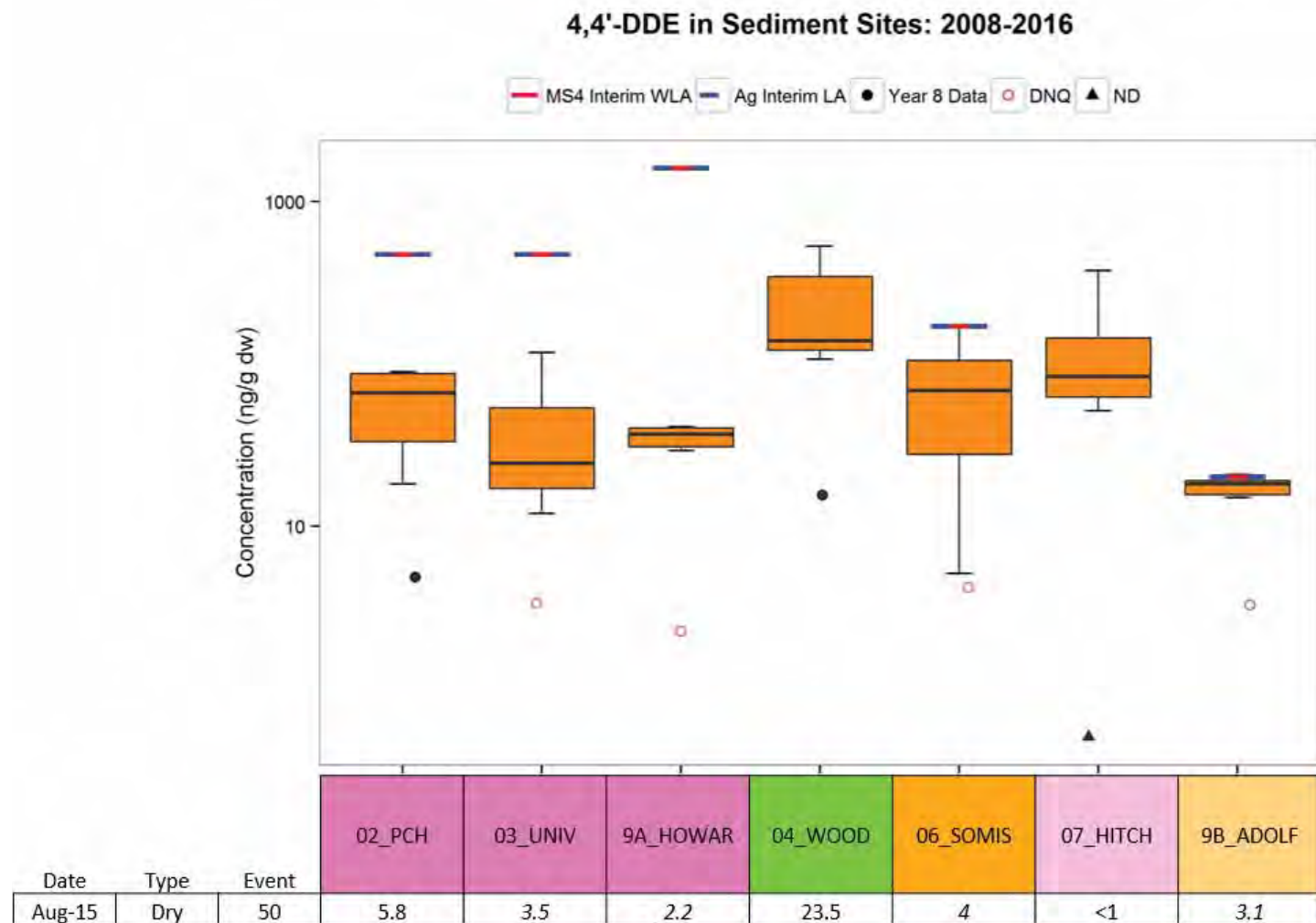


Figure 21. 4,4'-DDE Sediment Concentrations in Receiving Water Sites: 2008-2016

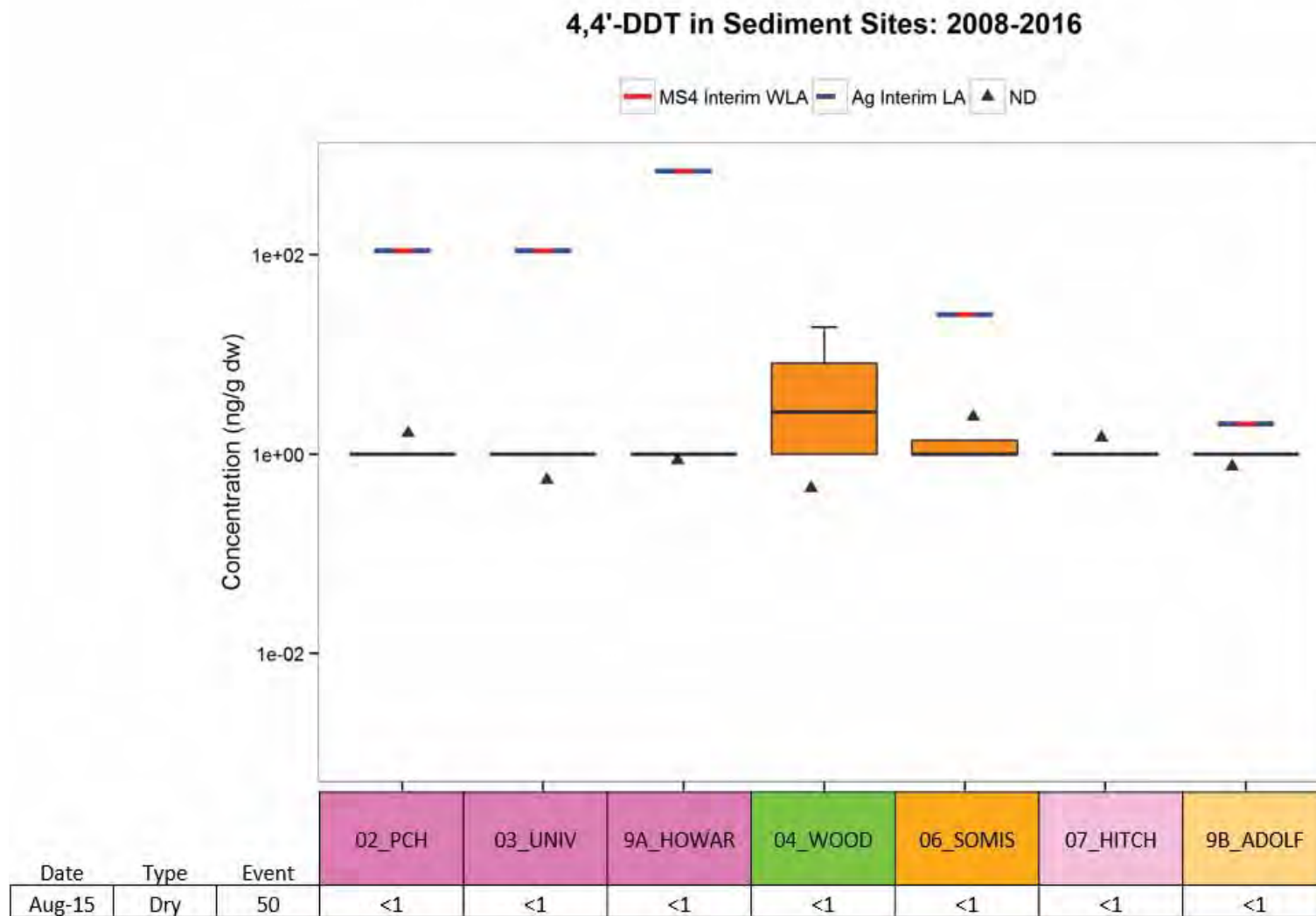


Figure 22. 4,4'-DDT Sediment Concentrations in Receiving Water Sites: 2008-2016

Total Chlordane in Sediment Sites: 2008-2016

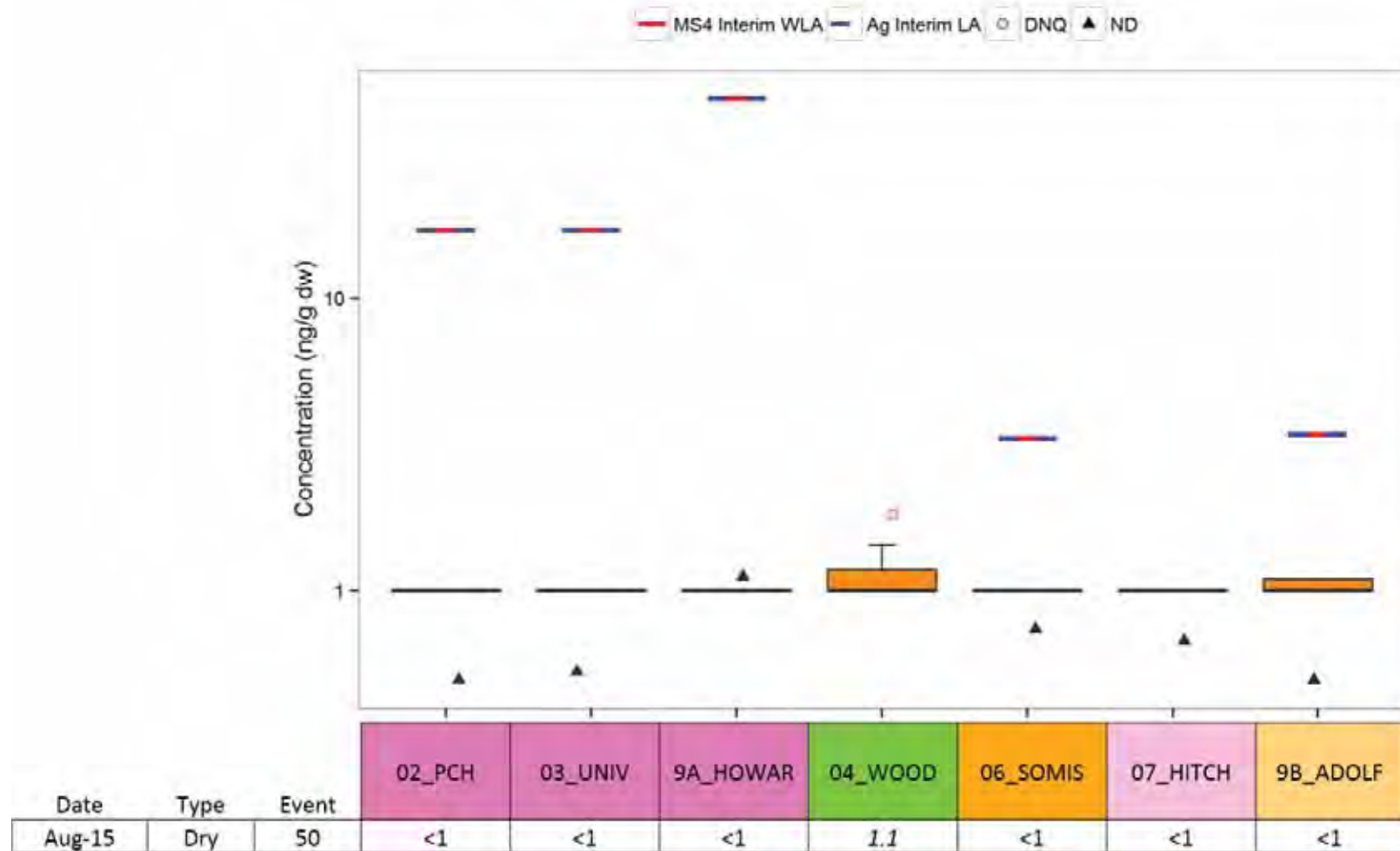


Figure 23. Total Chlordane Sediment Concentrations in Receiving Water Sites: 2008-2016

Toxaphene in Sediment Sites: 2008-2016

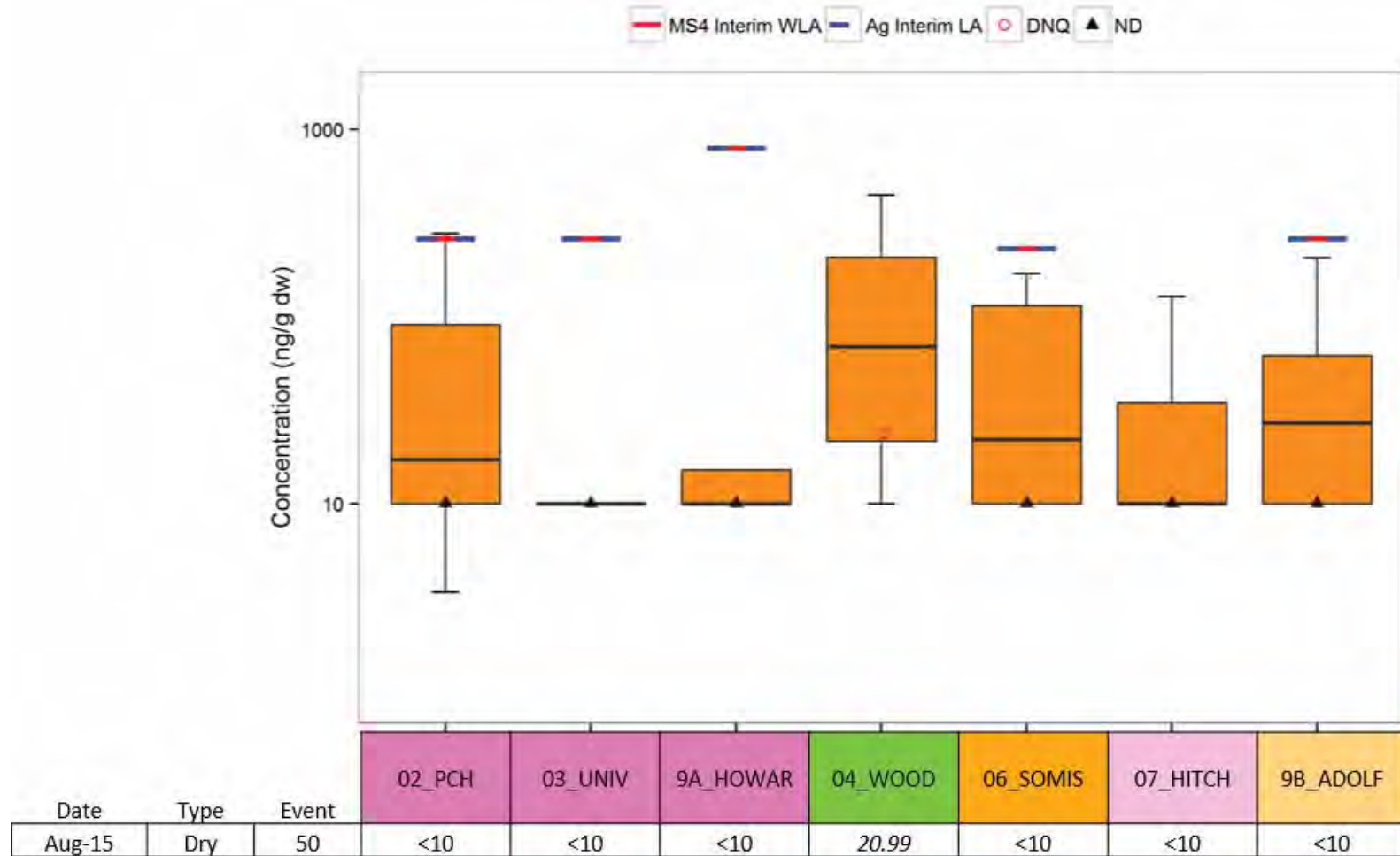


Figure 24. Toxaphene Sediment Concentrations in Receiving Water Sites: 2008-2016

METALS TMDL DATA SUMMARY

The following figures present metals water quality data from receiving water, agricultural, urban, and POTW monitoring sites. Currently effective total metals interim load allocations and waste load allocations differ for wet and dry weather, therefore the data for each of these conditions is provided separately. Interim POTW waste load allocations for total mercury are in load form and are therefore calculated and presented in the compliance section of the report. The Metals TMDL specifies final targets for both dissolved copper and zinc. Dissolved concentrations for these two metals have been plotted for reference. Data collected during year eight, which is the reporting period for this document, have been overlain on the box plots as circles. The box plots include all of the data collected during this program (2008-2016). This was done to allow for easy comparison between recent data and what have been collected overall. The eighth year data are presented in tabular form below each box plot. Bolded values in the tables within each figure indicate the concentration was above the applicable limits for that constituent. Italicized values in the tables within each figure indicate the concentration was DNQ. Values in the tables within each figure with a "<" preceding them, indicate the constituent was ND at the MDL for that constituent. Values identified as "--" in the tables indicate no samples were collected at those sites for those events.

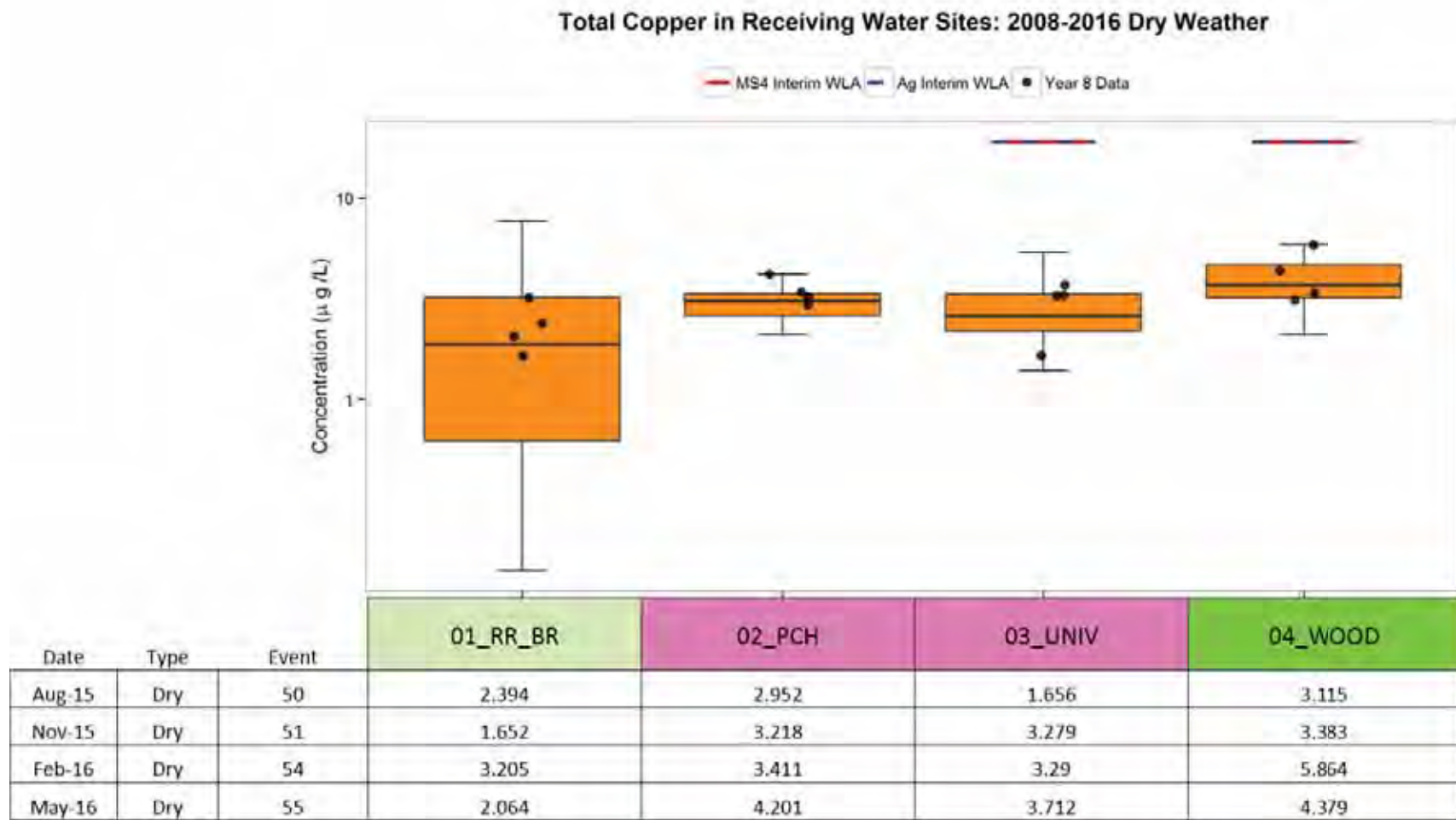


Figure 25. Total Copper Dry Weather Concentrations in Receiving Water Sites: 2008-2016

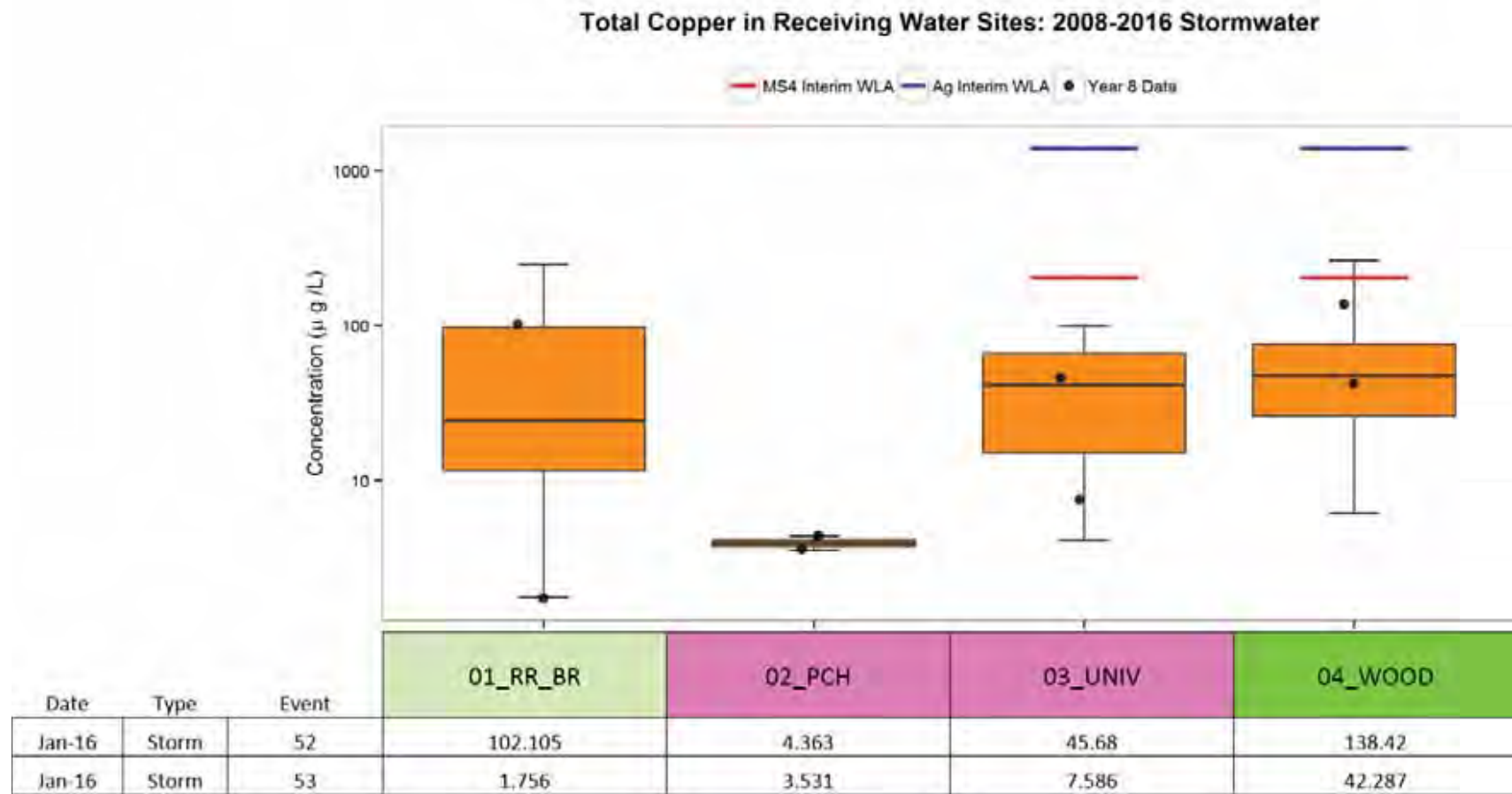


Figure 26. Total Copper Stormwater Concentrations in Receiving Water Sites: 2008-2016

Total Copper in Water from Urban, Ag, & POTW Sites: 2008-2016 Dry Weather

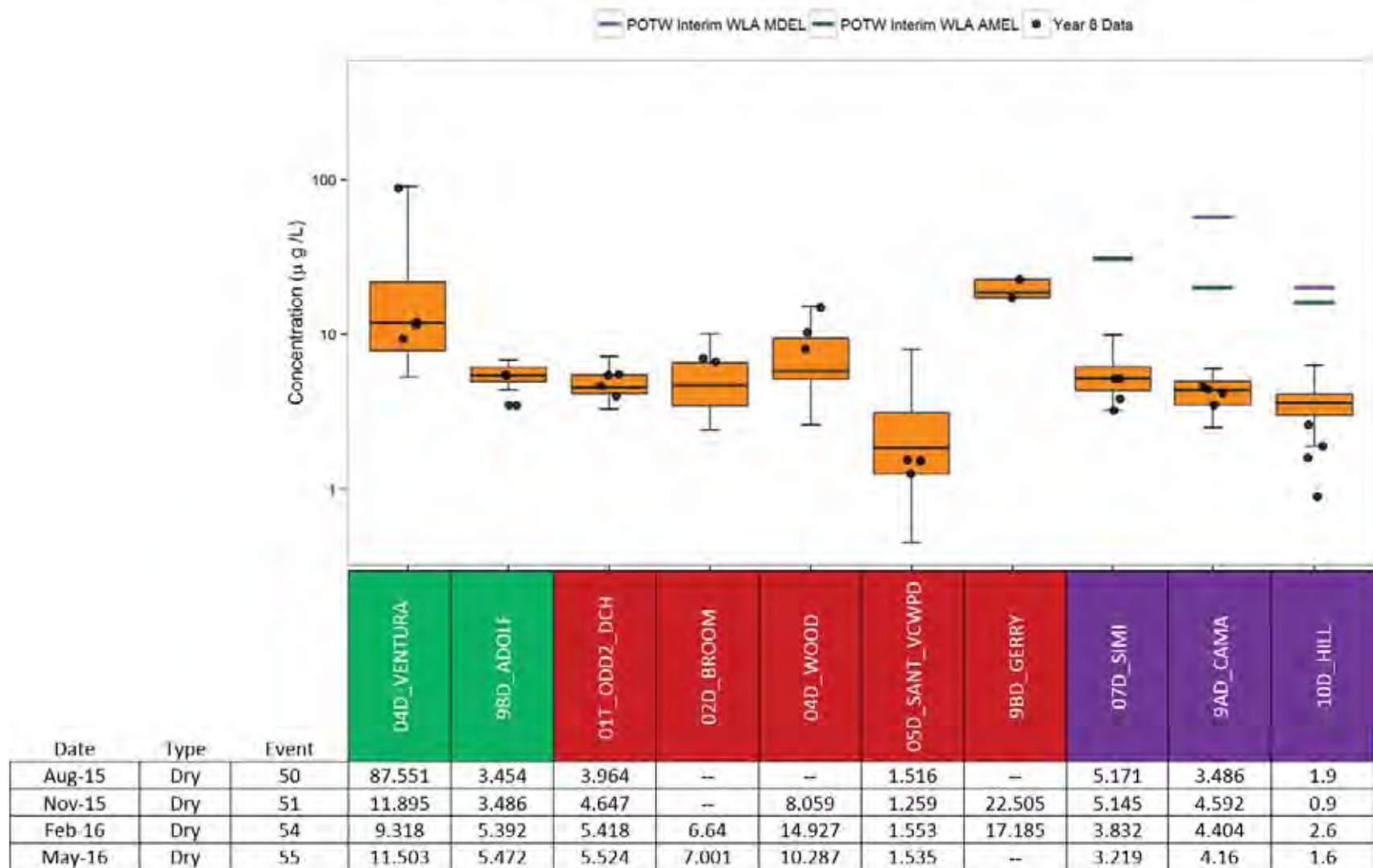


Figure 27. Total Copper Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2016

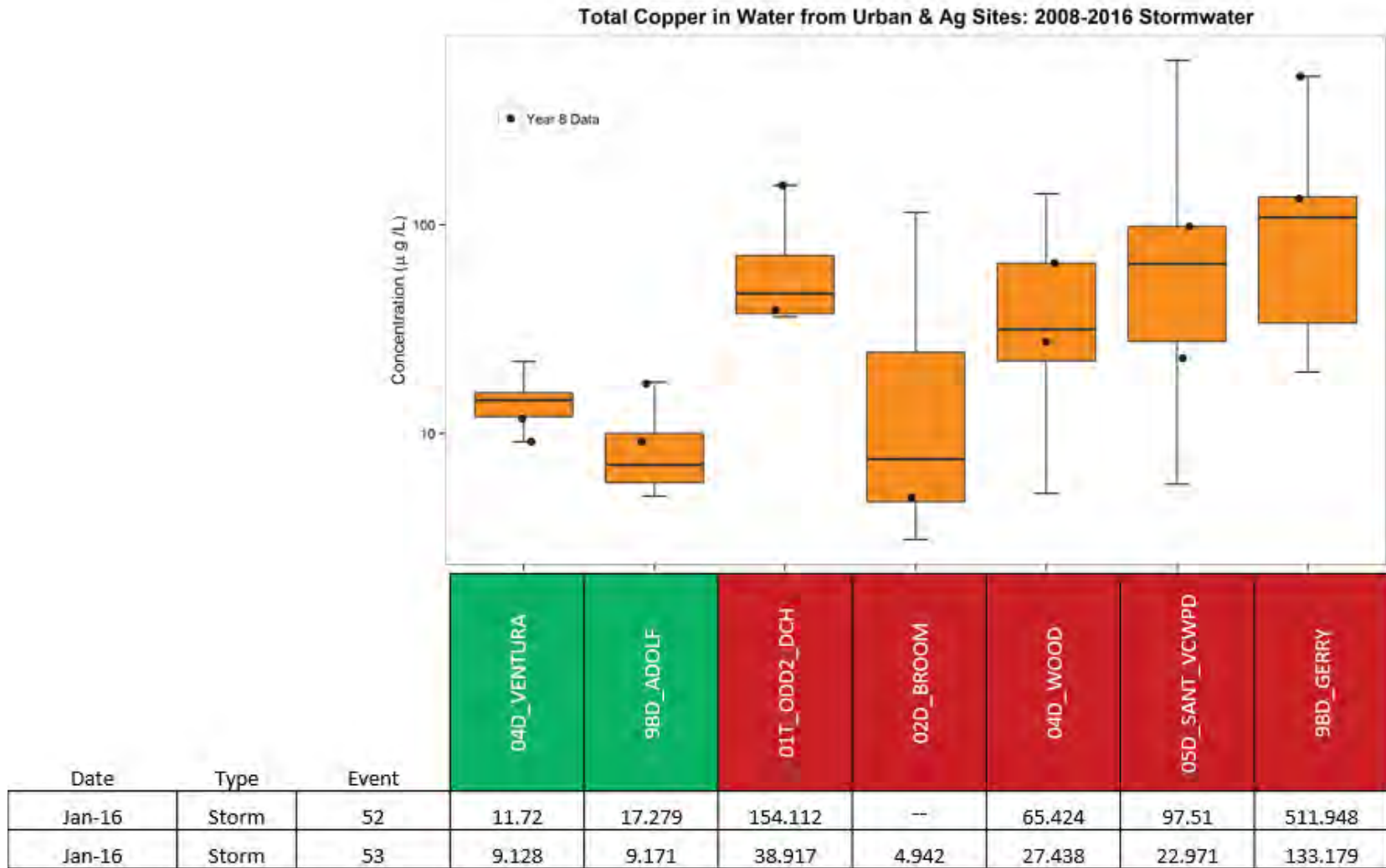


Figure 28. Total Copper Wet Weather Concentrations in Urban and Ag Sites: 2008-2016

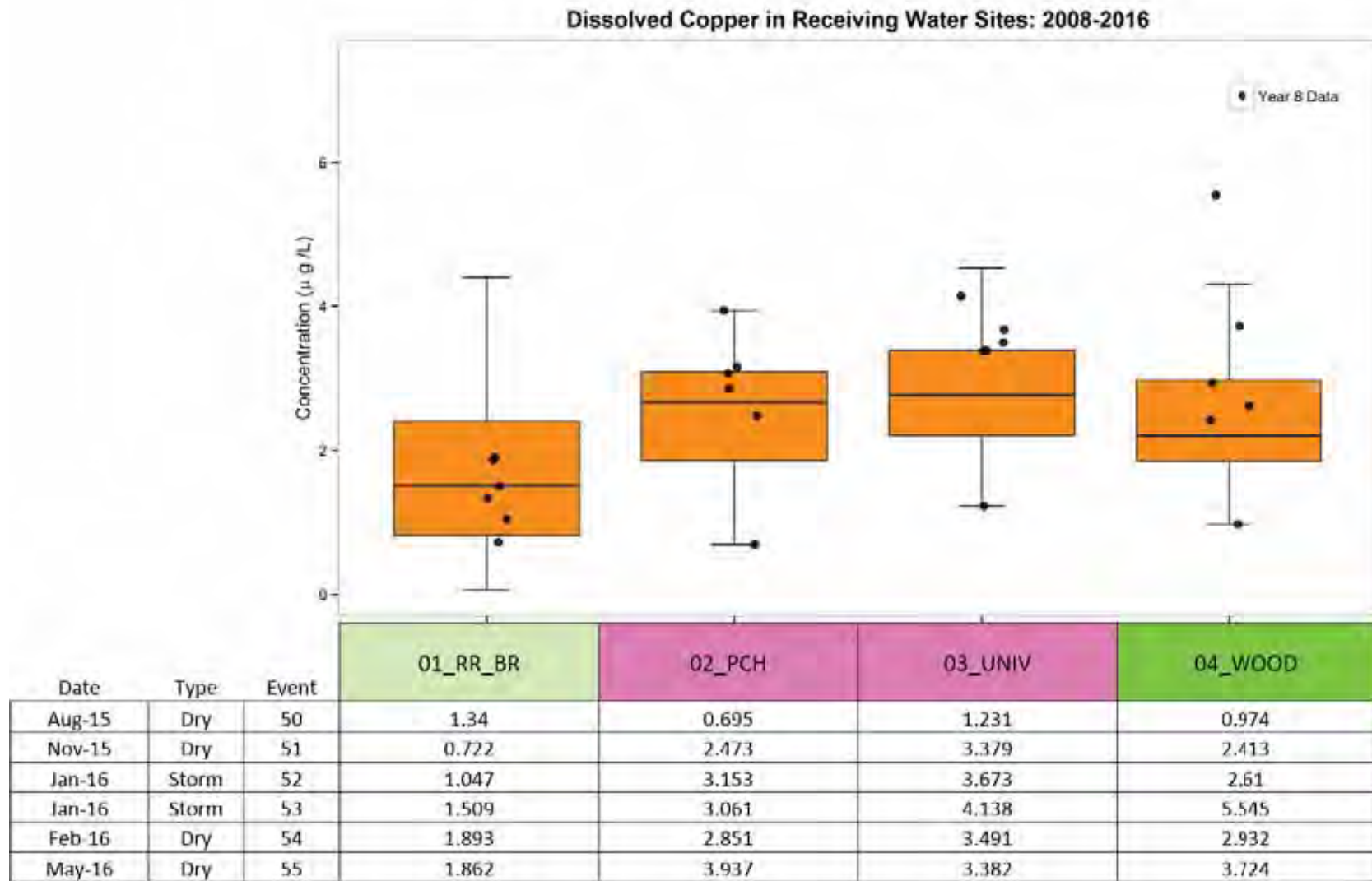


Figure 29. Dissolved Copper Concentrations in Receiving Water Sites: 2008-2016

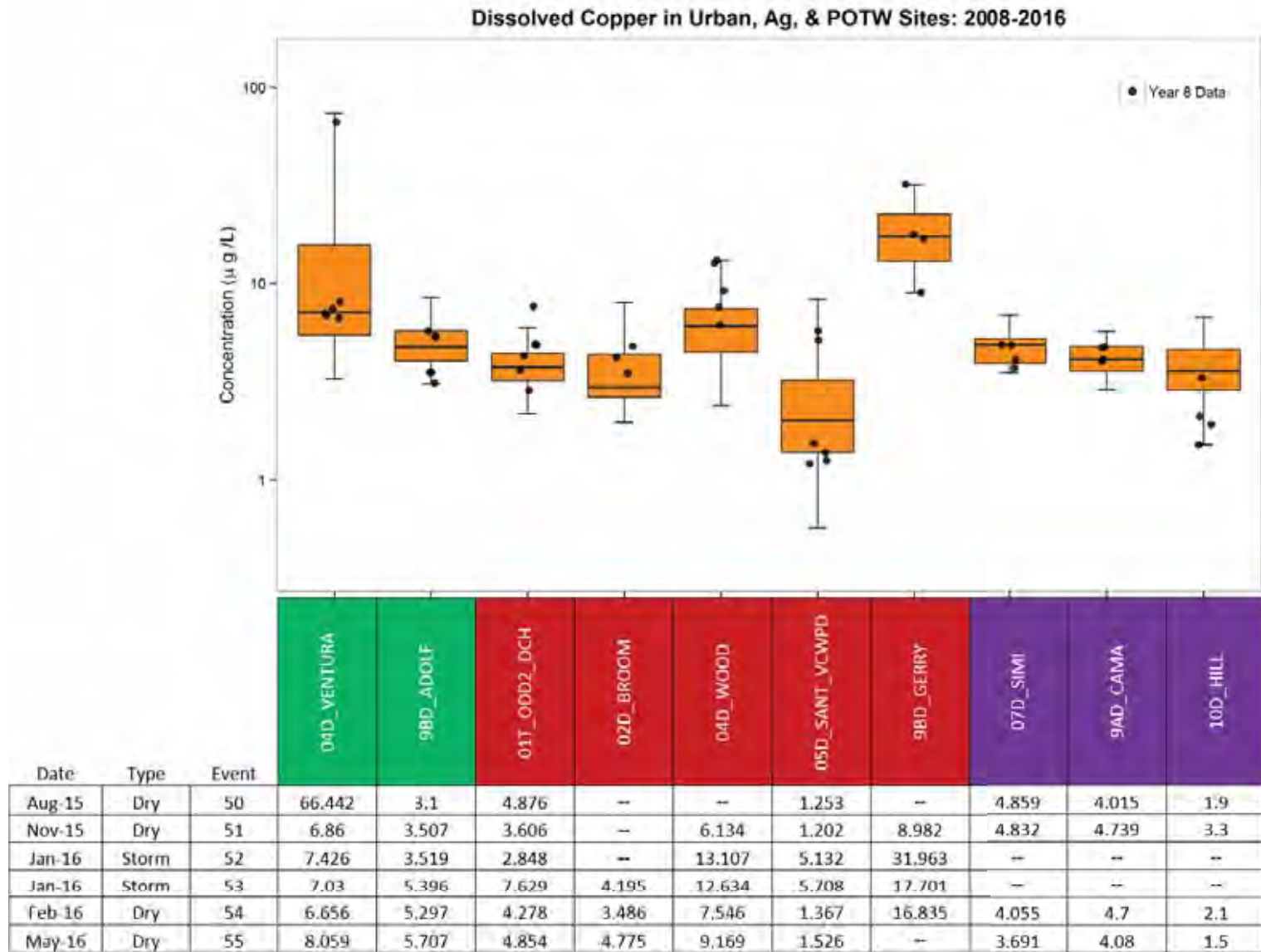


Figure 30. Dissolved Copper Concentrations in Urban, Ag, and POTW Sites: 2008-2016

Total Mercury in Receiving Water Sites: 2008-2016

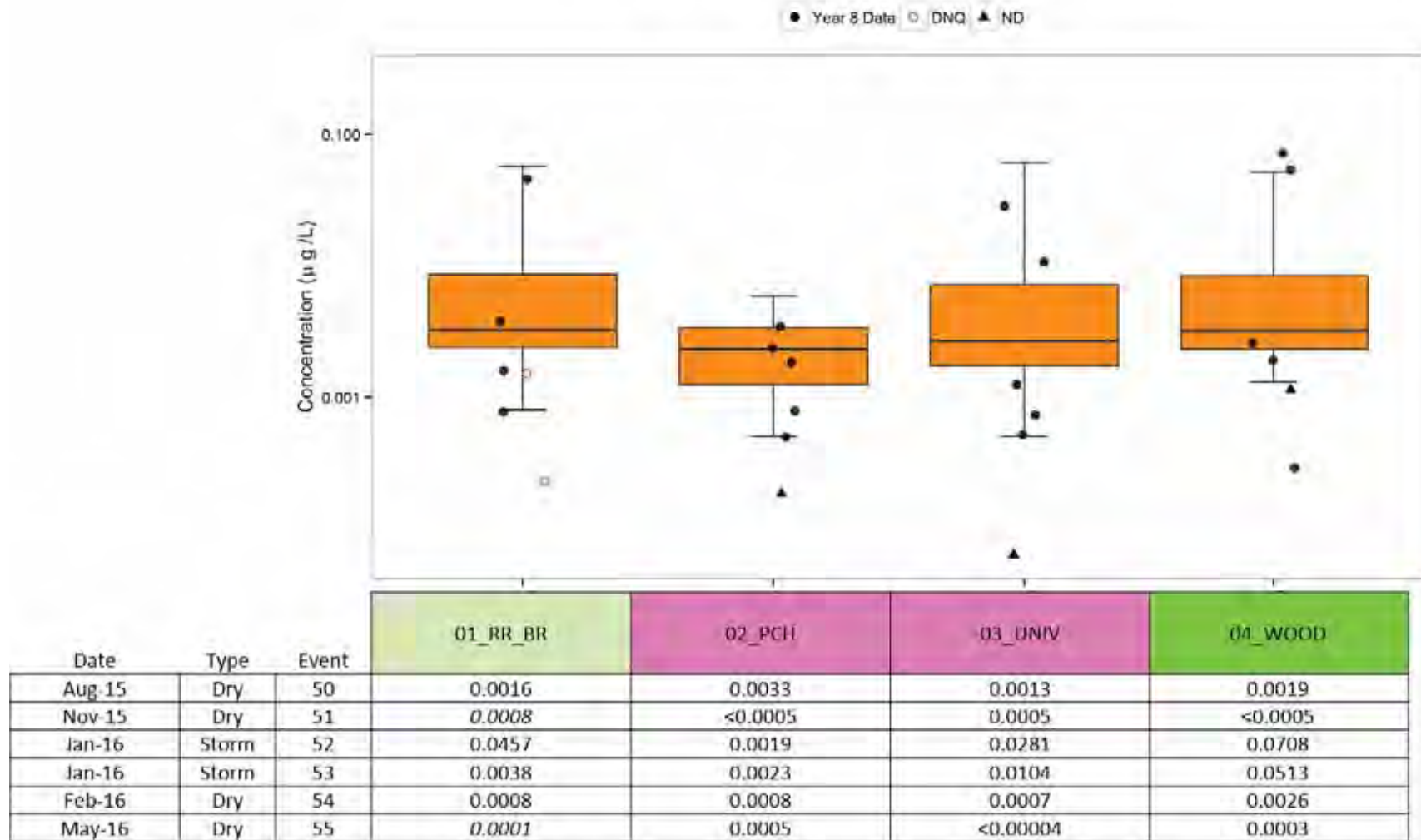


Figure 31. Total Mercury Concentrations in Receiving Water Sites: 2008-2016

Total Mercury in Urban, Ag, & POTW Sites: 2008-2016

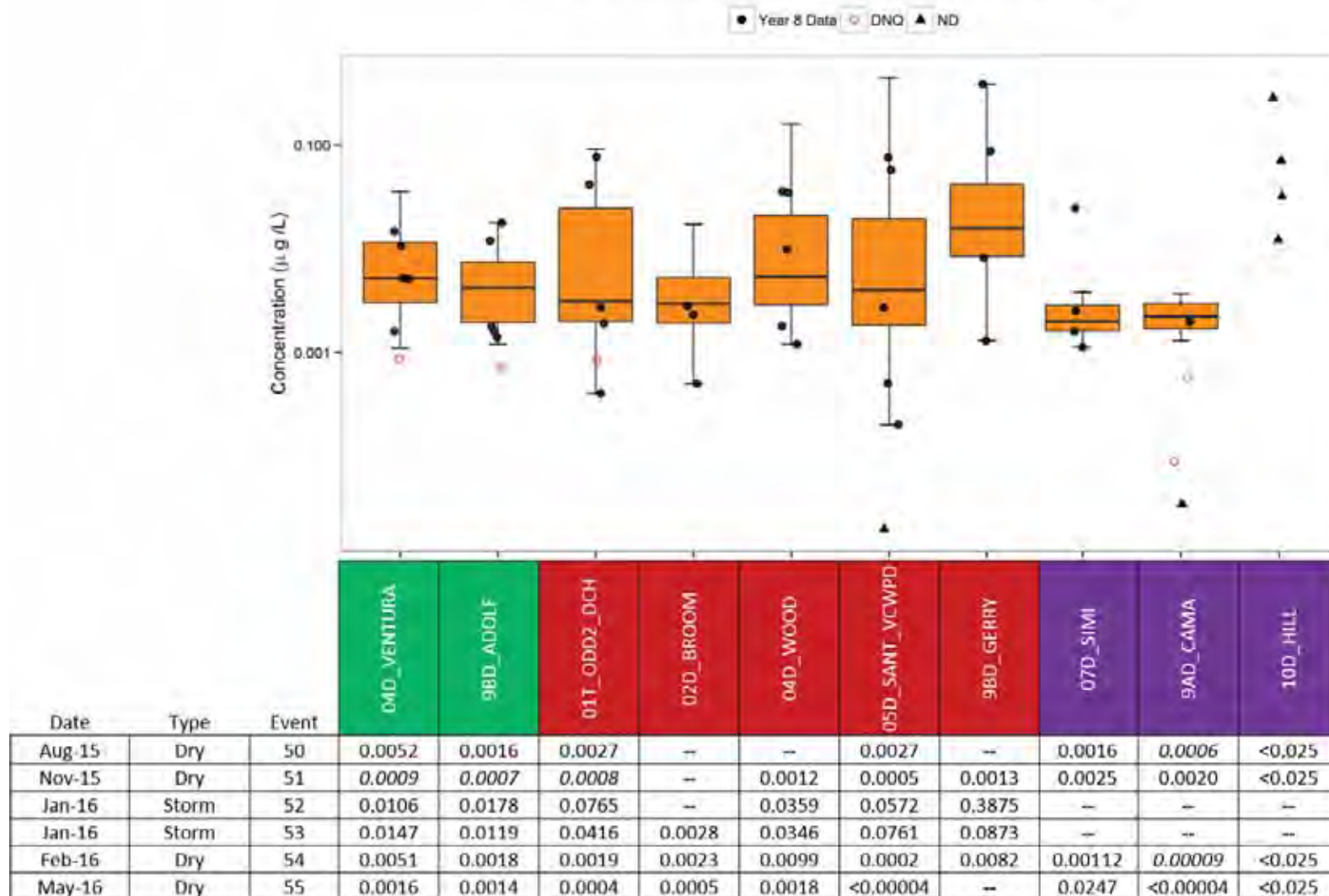


Figure 32. Total Mercury Concentrations in Urban and Ag Sites: 2008-2016

Total Nickel in Receiving Water Sites: 2008-2016 Dry Weather

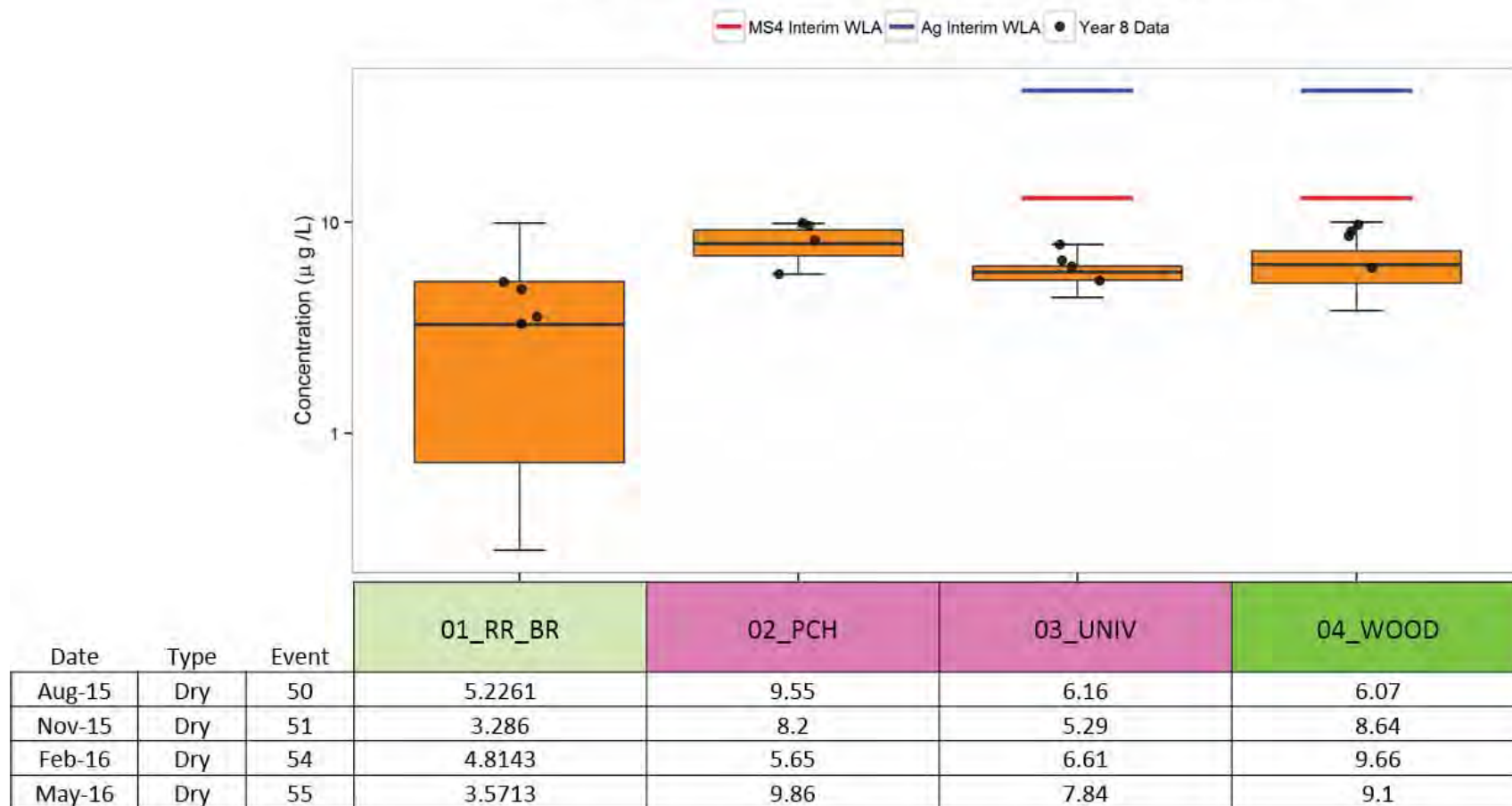


Figure 33. Total Nickel Dry Weather Concentrations in Receiving Water Sites: 2008-2016

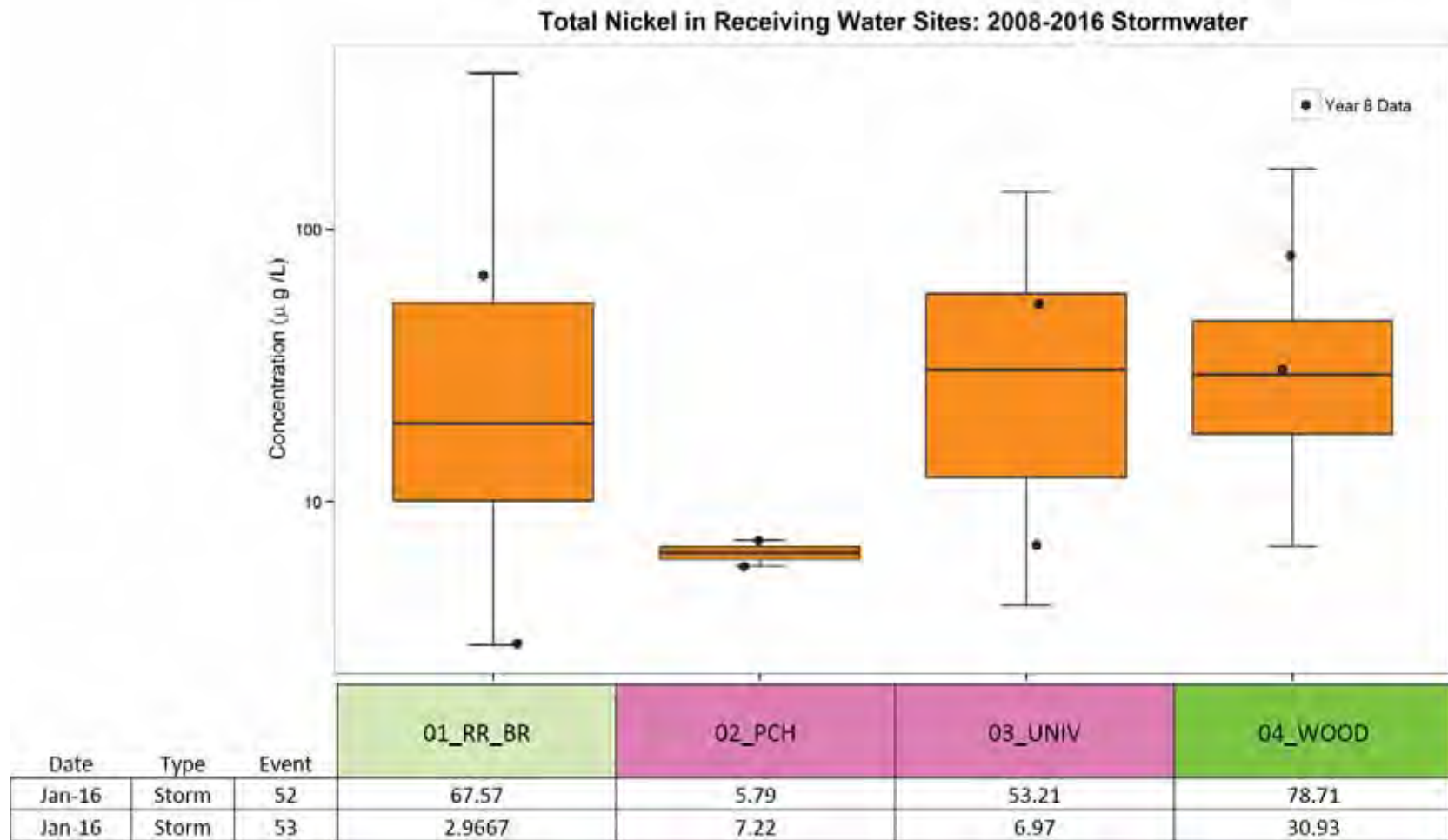


Figure 34. Total Nickel Stormwater Concentrations in Receiving Water Sites: 2008-2016

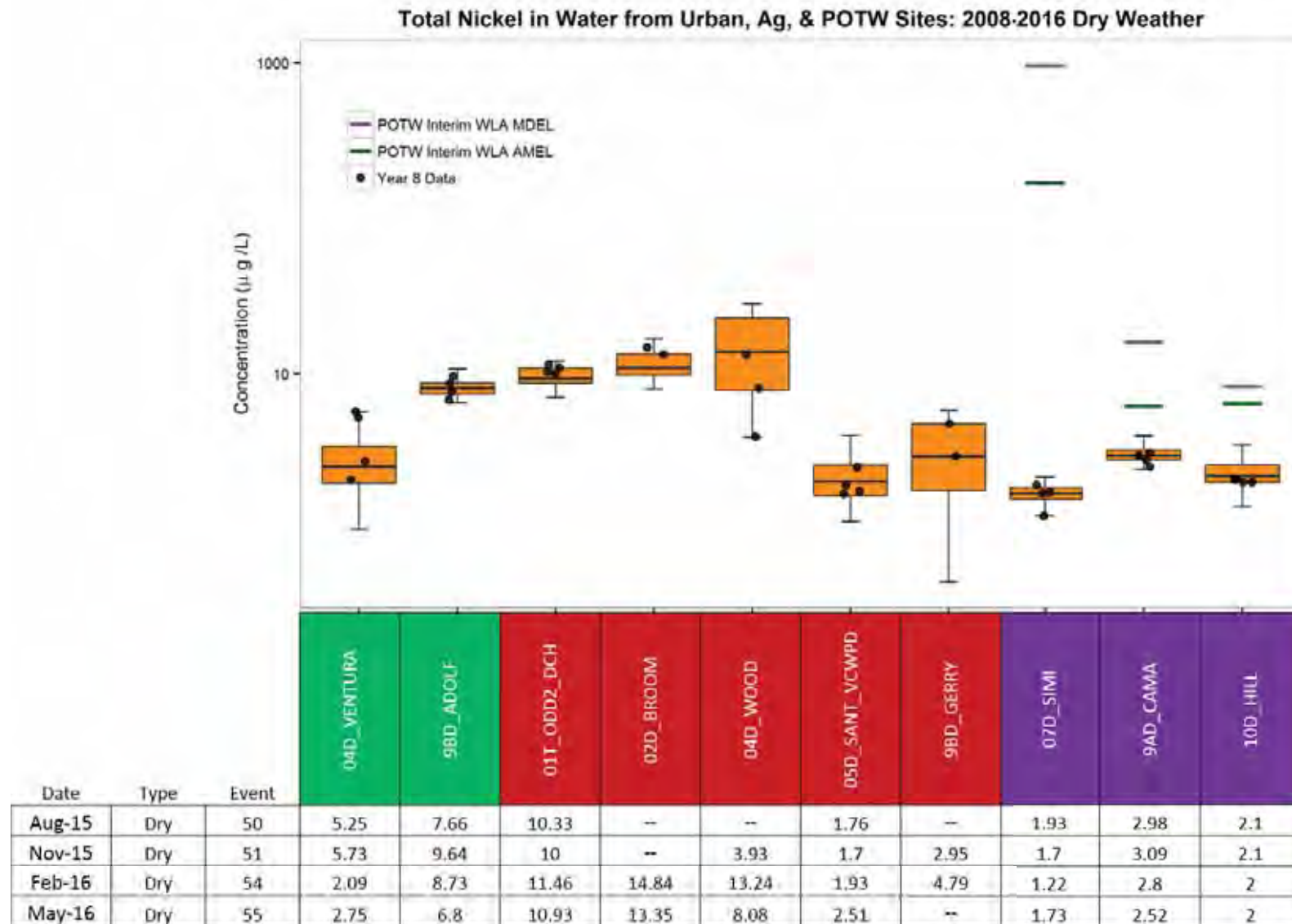


Figure 35. Total Nickel Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2016

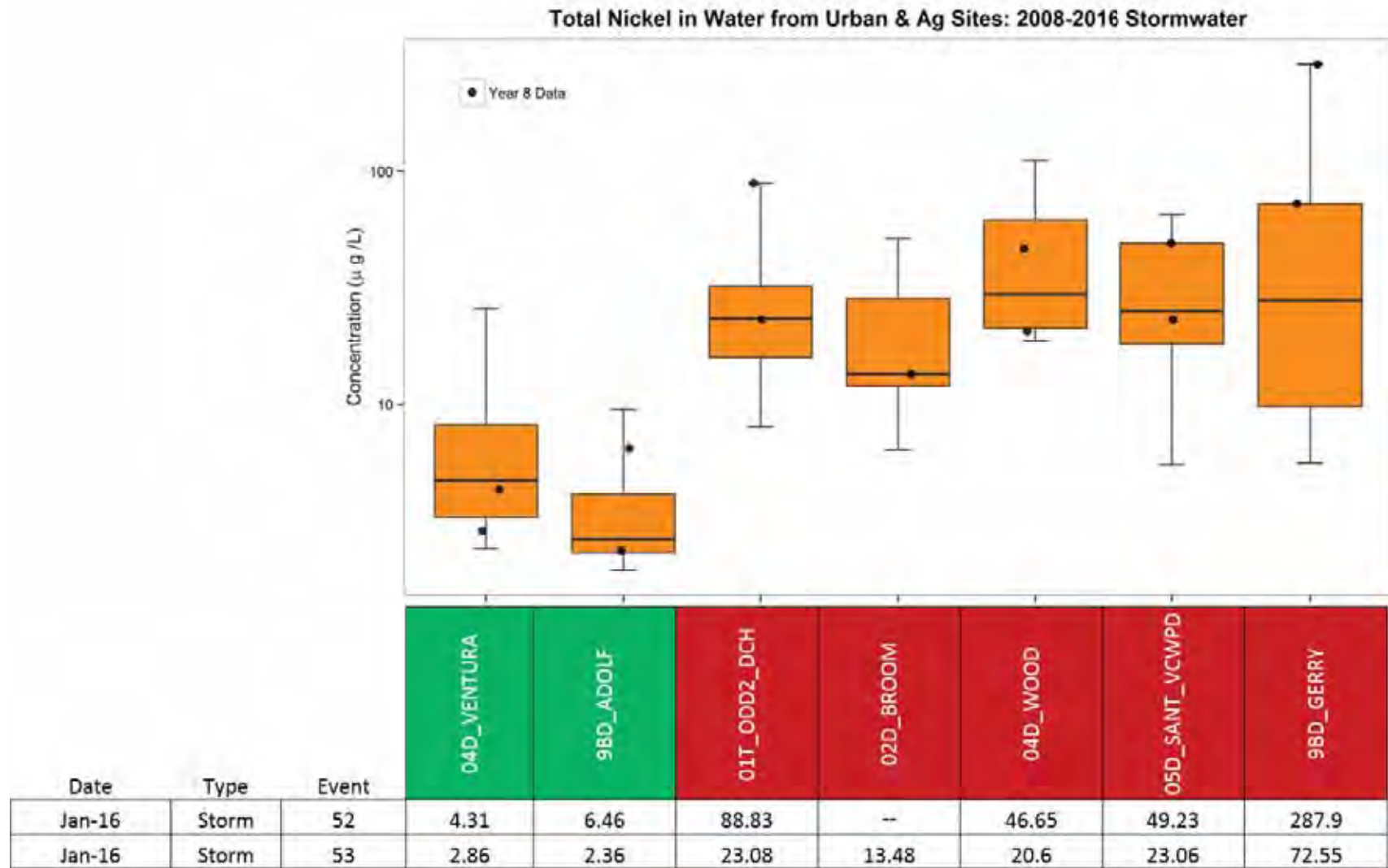


Figure 36. Total Nickel Stormwater Concentrations in Urban and Ag Sites: 2008-2016

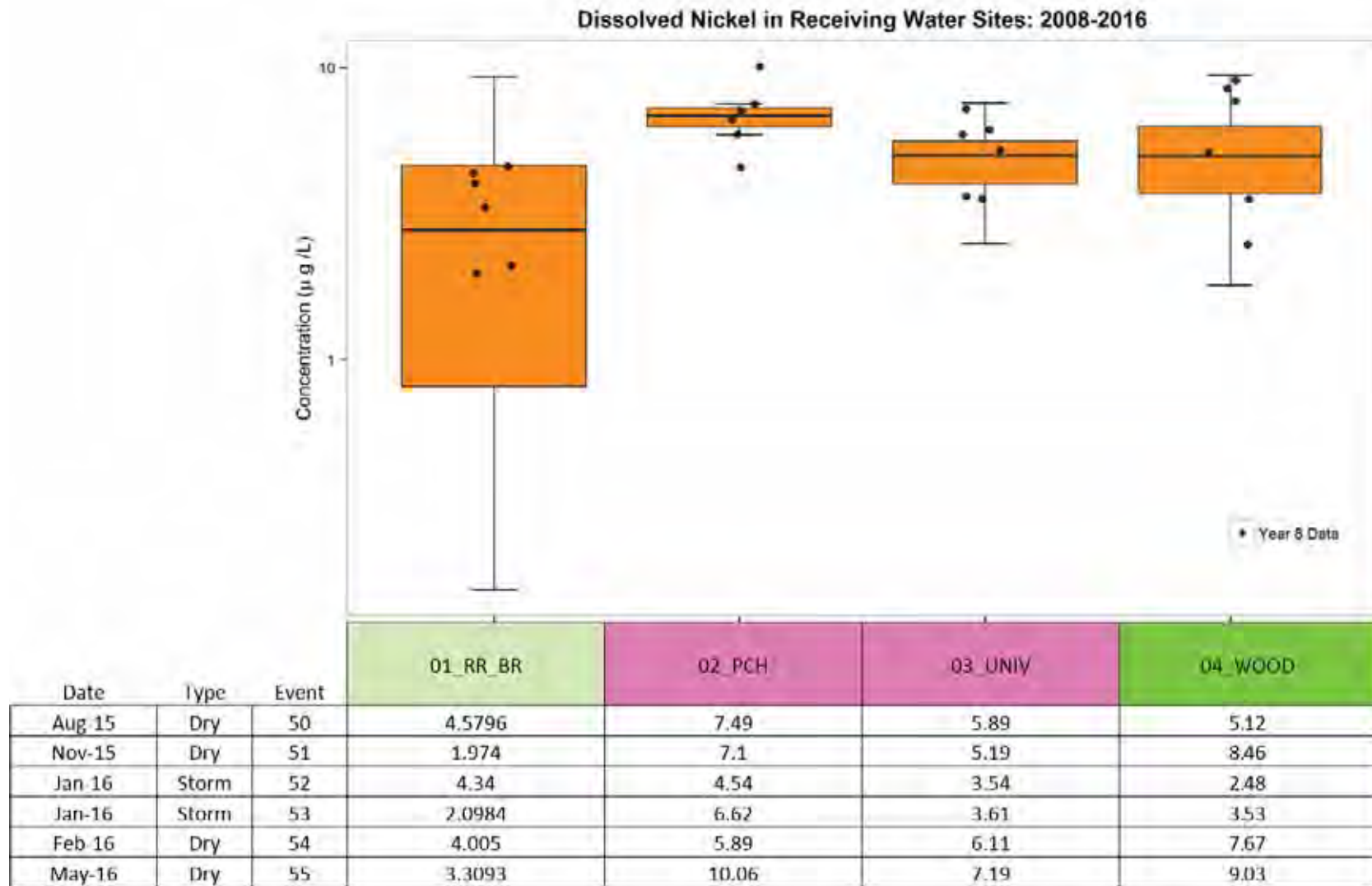


Figure 37. Dissolved Nickel Concentrations in Receiving Water Sites: 2008-2016

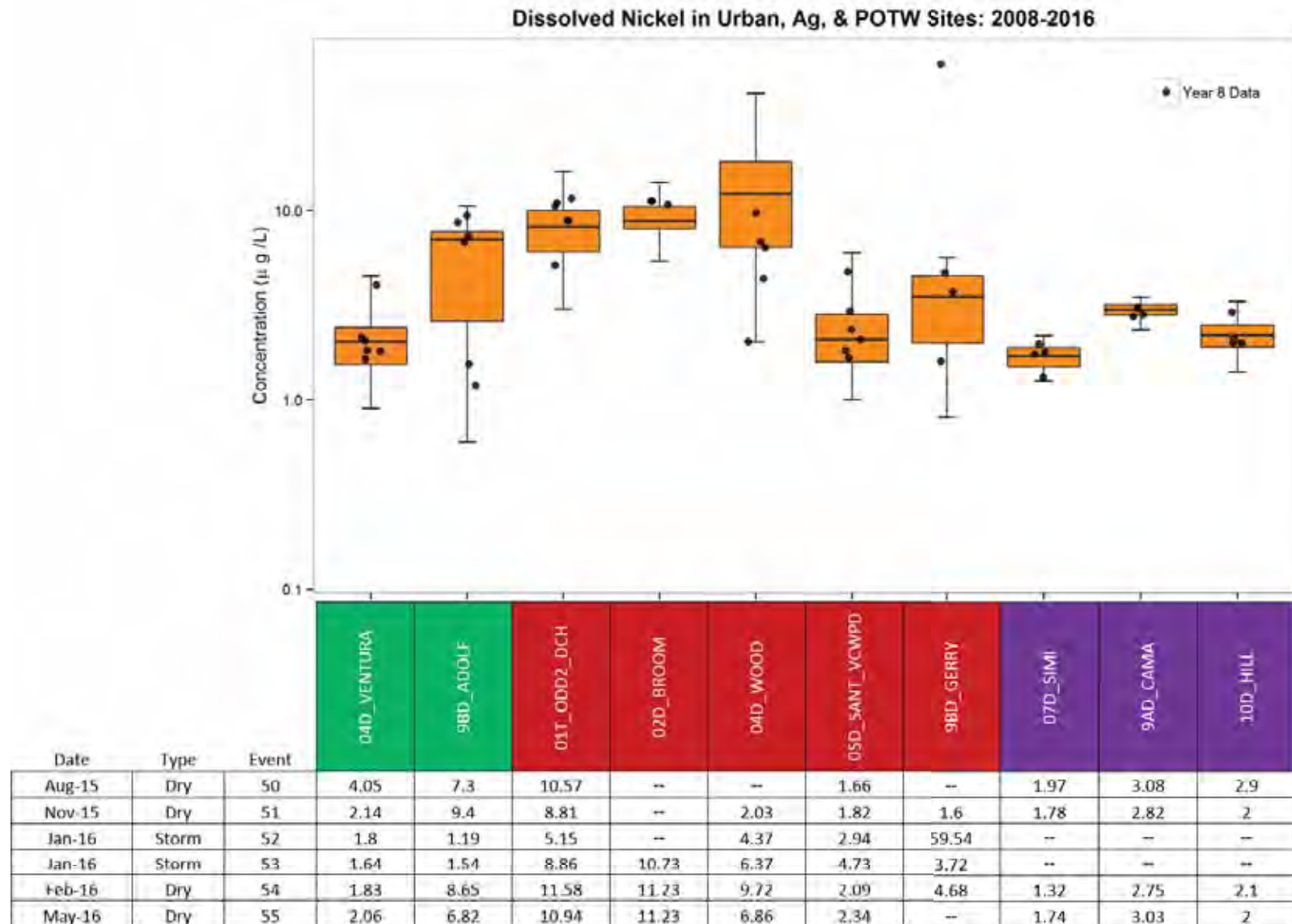


Figure 38. Dissolved Nickel Concentrations in Urban, Ag, and POTW Sites: 2008-2016

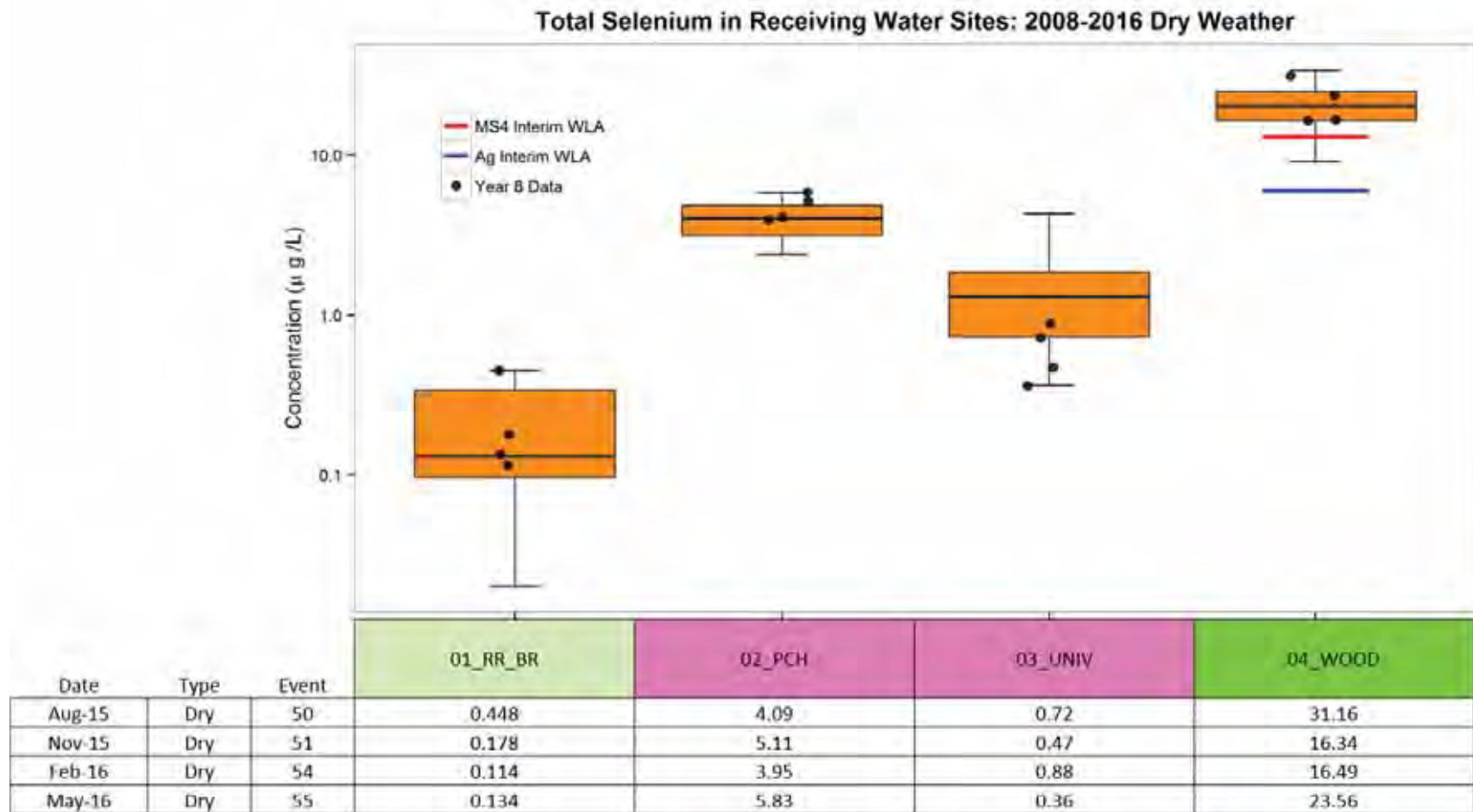


Figure 39. Total Selenium Dry Weather Concentrations in Receiving Water Sites: 2008-2016

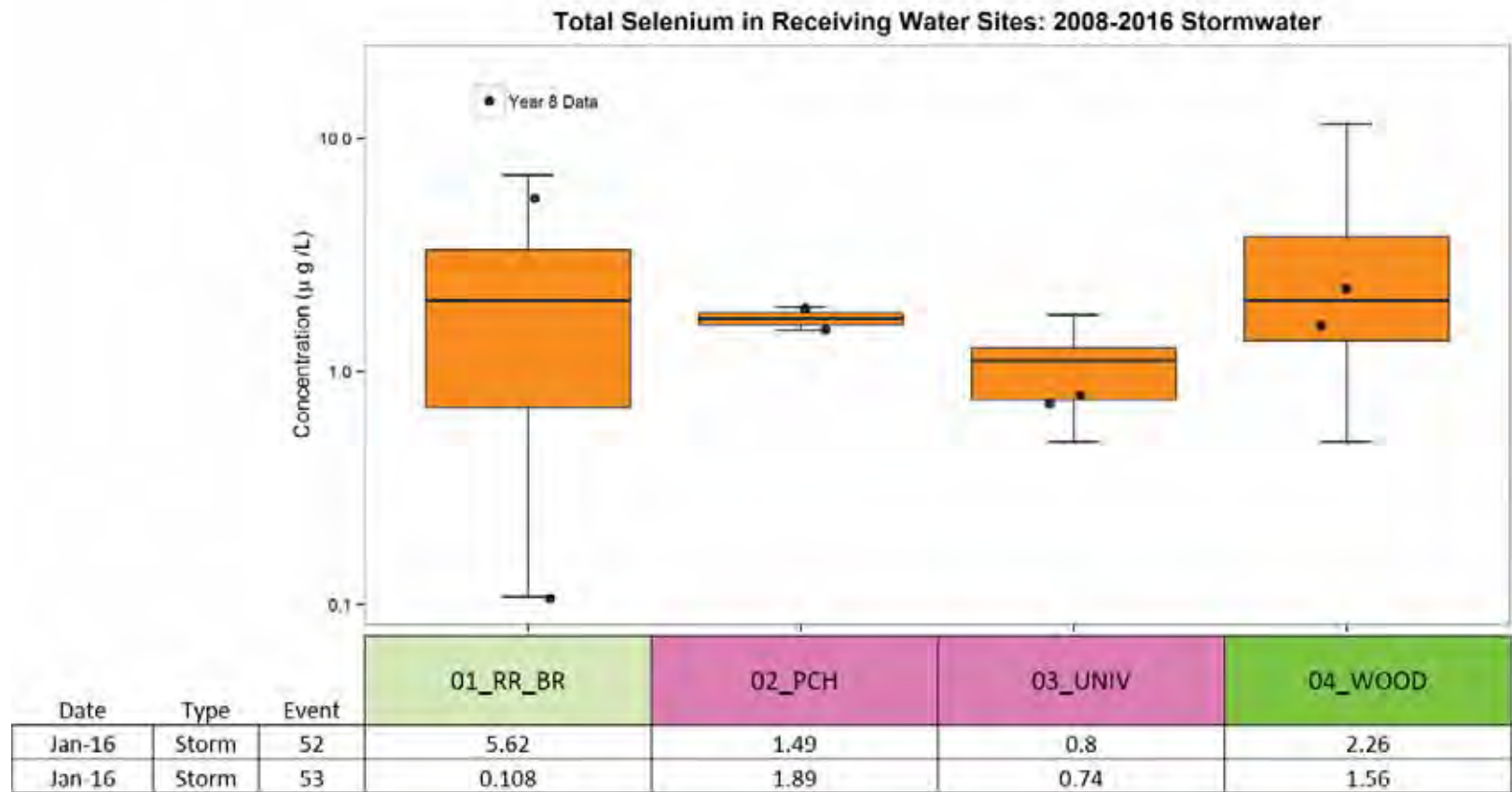


Figure 40. Total Selenium Stormwater Concentration in Receiving Water Sites: 2008-2016

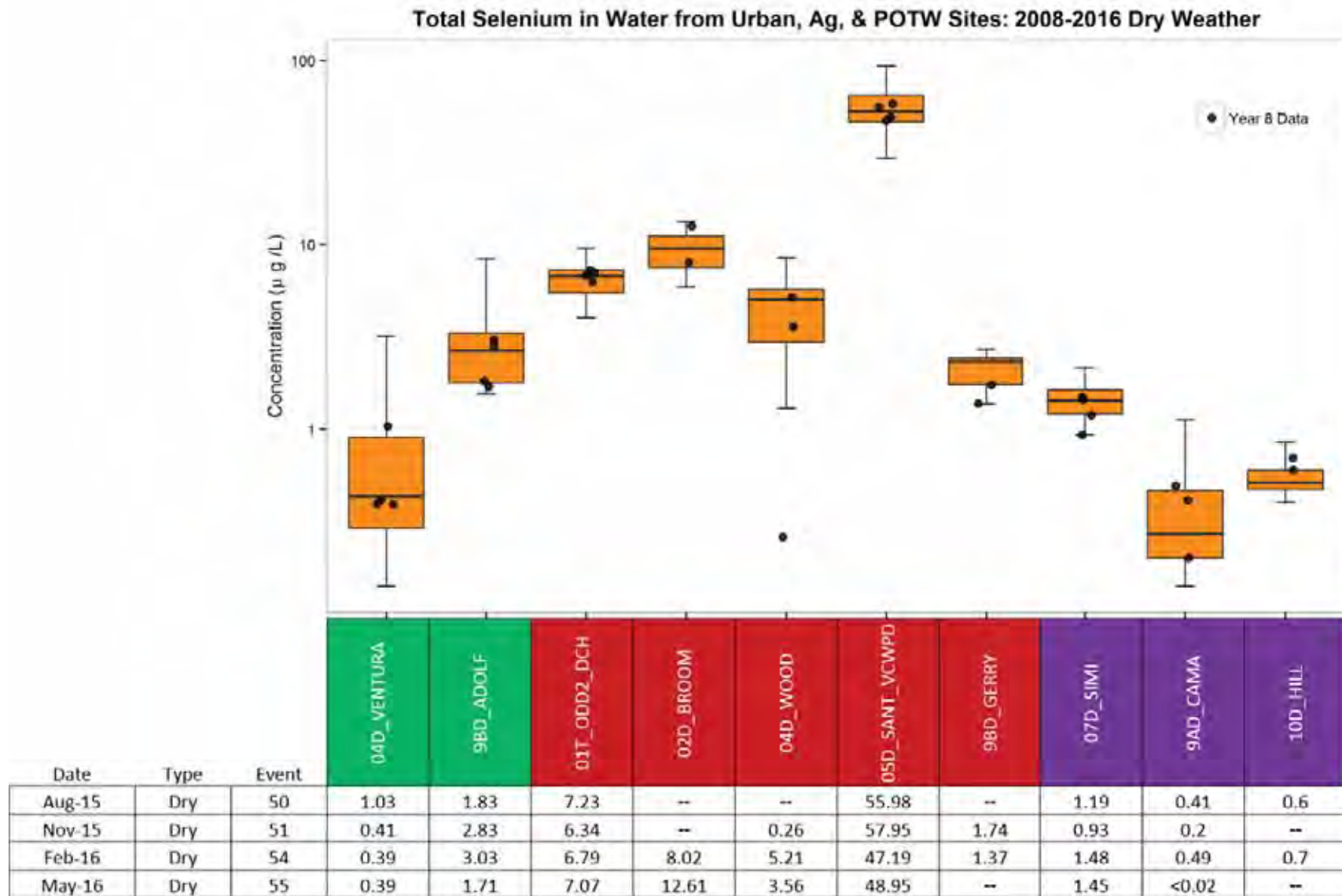


Figure 41. Total Selenium Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2016

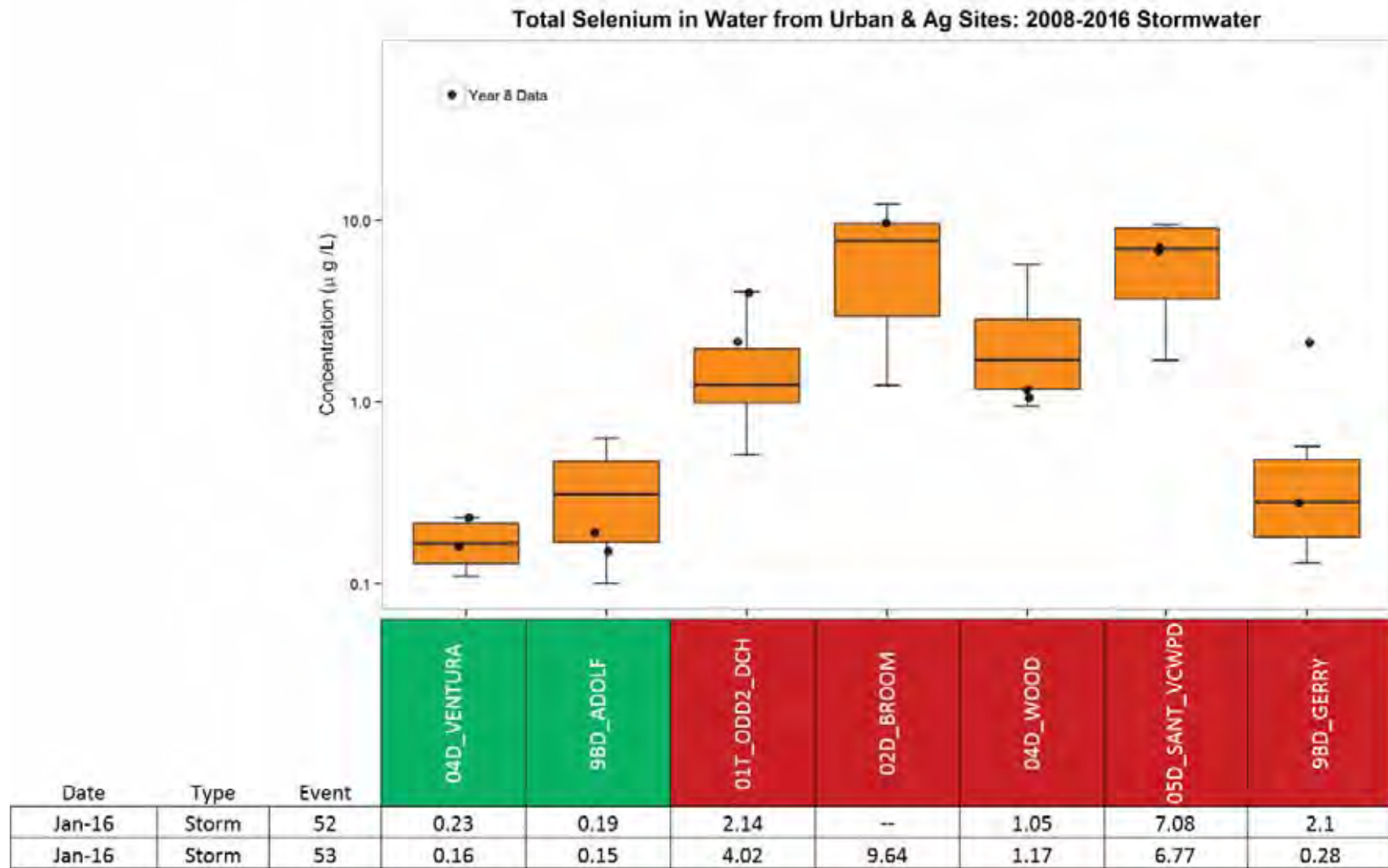


Figure 42. Total Selenium Stormwater Concentrations in Urban and Ag Sites: 2008-2016

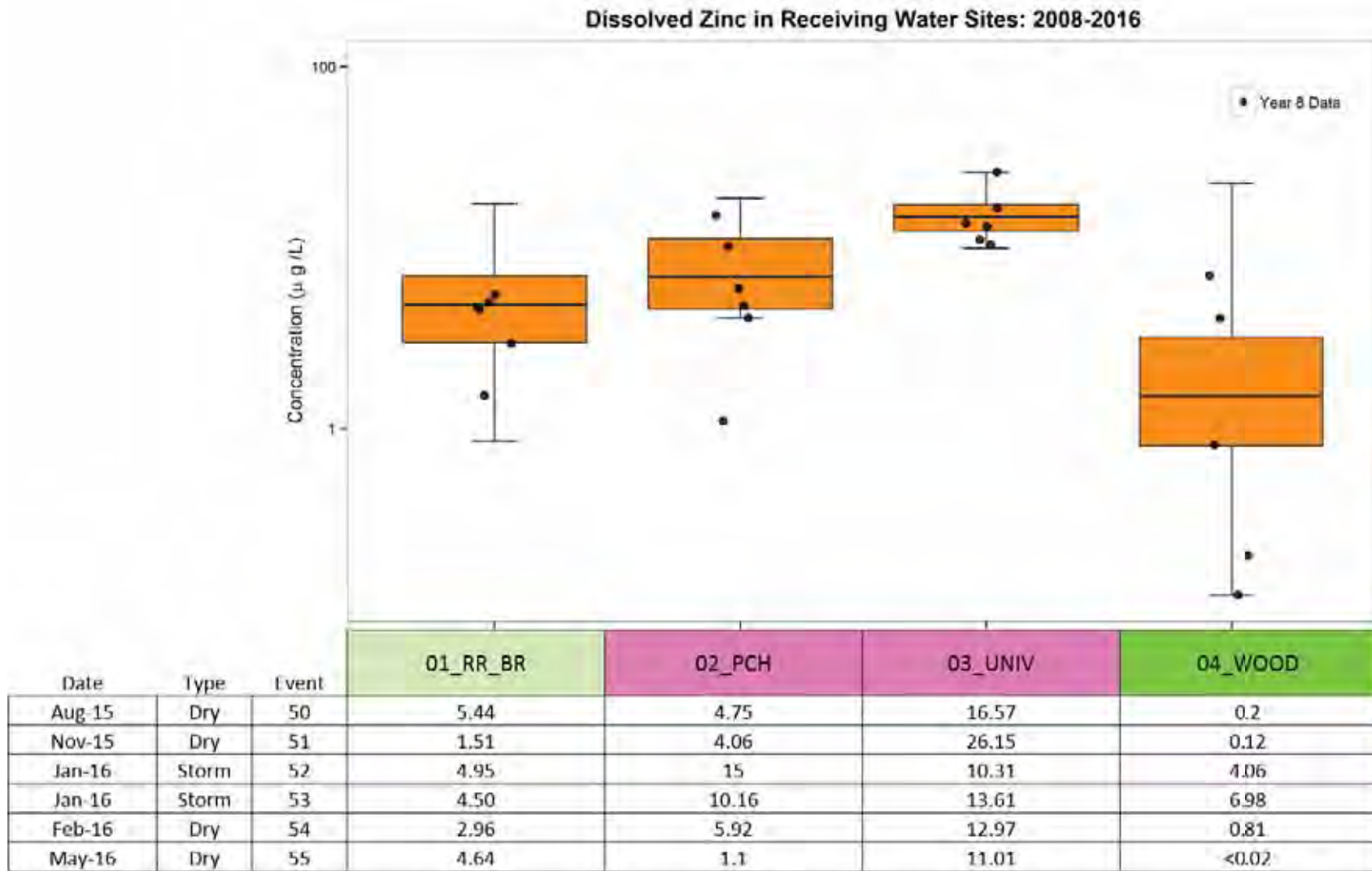


Figure 43. Dissolved Zinc Concentrations in Receiving Water Sites: 2008-2016

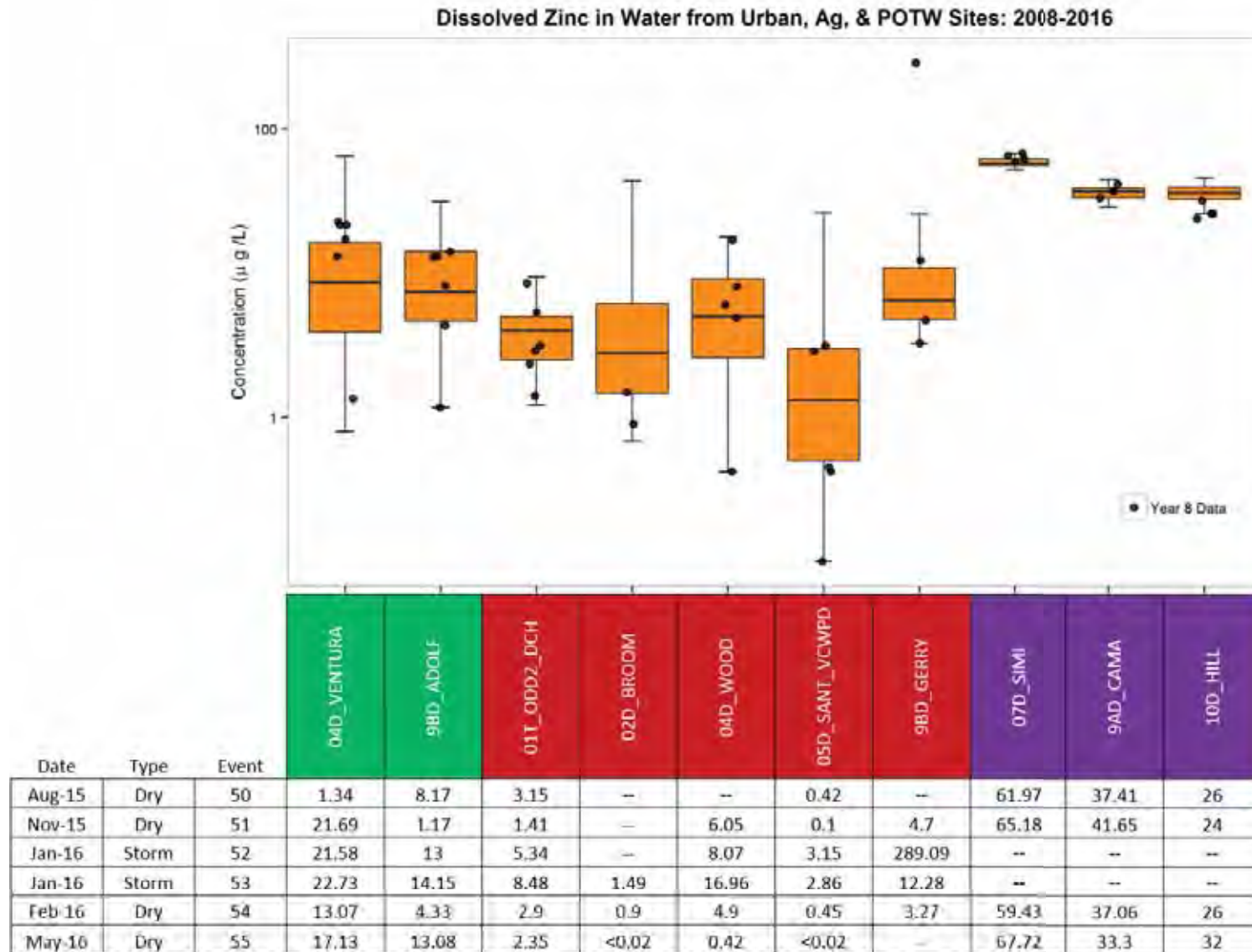
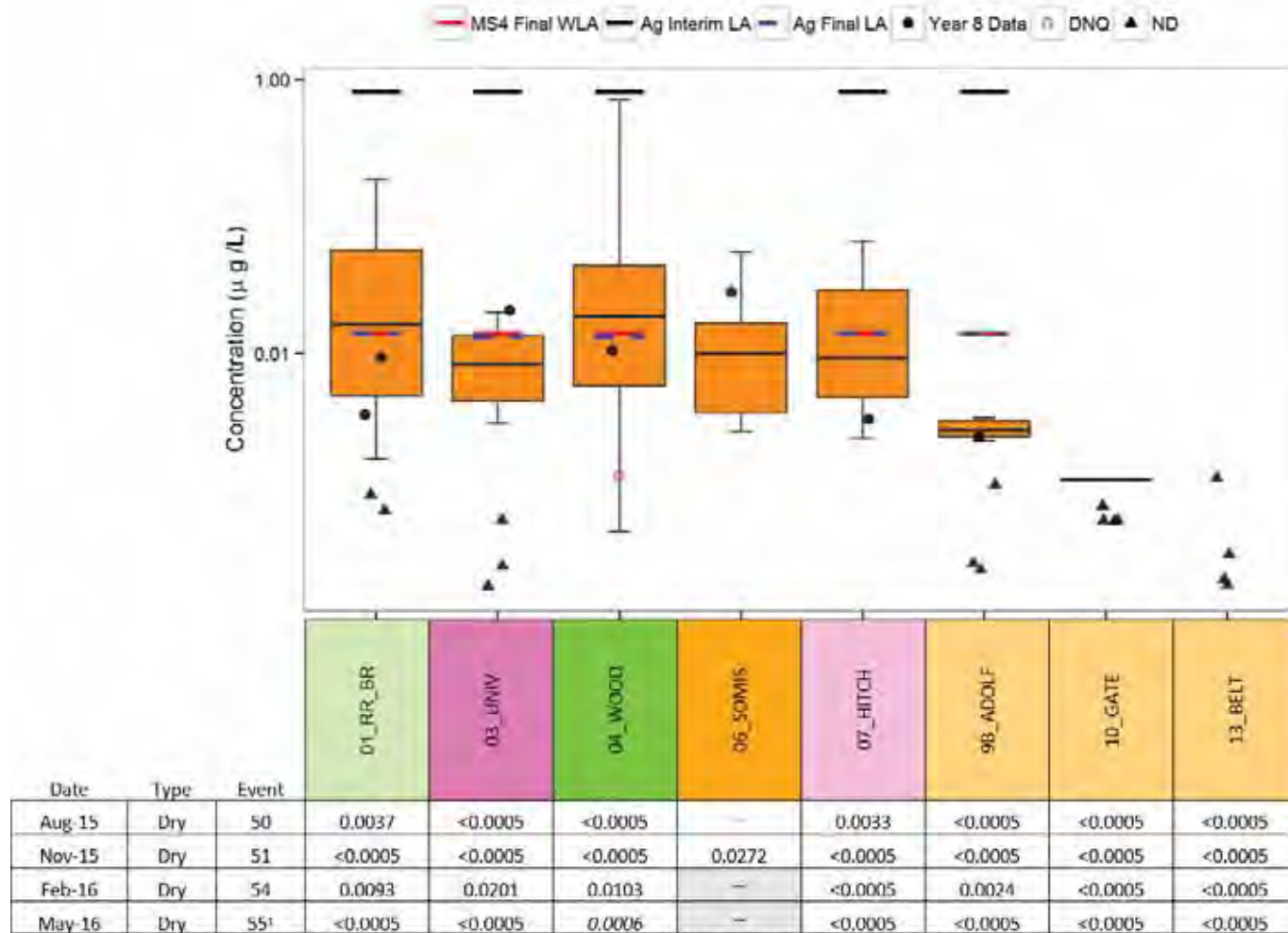


Figure 44. Dissolved Zinc Concentrations in Urban, Ag, and POTW Sites: 2008-2016

TOXICITY TMDL

For the Toxicity TMDL, urban dischargers' and POTWs' final wasteload allocations are effective. For agricultural dischargers, interim load allocations were in effect until March 24, 2016, at which point final allocations became effective. The compliance points for these allocations are in the receiving waters at the base of the subwatersheds and are shown on the box plots for the appropriate site locations. Data for chlorpyrifos and diazinon has been separated into dry weather and stormwater since the allocations differ for the two conditions. Data collected during year eight, which is the reporting period for this document, have been overlain on the box plots as circles. The box plots include all of the data collected during this program (2008-2016). This was done to allow for easy comparison between recent data and what have been collected overall. The eighth year data are presented in tabular form below each box plot. Bolded values in the tables within each figure indicate the concentration was above the applicable limits for that constituent. Italicized values in the tables within each figure indicate the concentration was DNQ. Values in the tables within each figure with a "<" preceding them, indicate the constituent was ND at the MDL for that constituent. Values identified as "--" in the tables indicate no samples were collected at those sites for those events.

Chlorpyrifos in Receiving Water Sites: 2008-2016 Dry Weather



1. Final allocations for agricultural dischargers became effective after March 24, 2016, and apply to Event 55, the final event of the year. This note applies to all Toxicity TMDL boxplots with Final LAs for agricultural dischargers.

Figure 45. Chlorpyrifos Dry Weather Concentrations in Receiving Water Sites: 2008-2016

Chlorpyrifos in Receiving Water Sites: 2008-2016 Stormwater

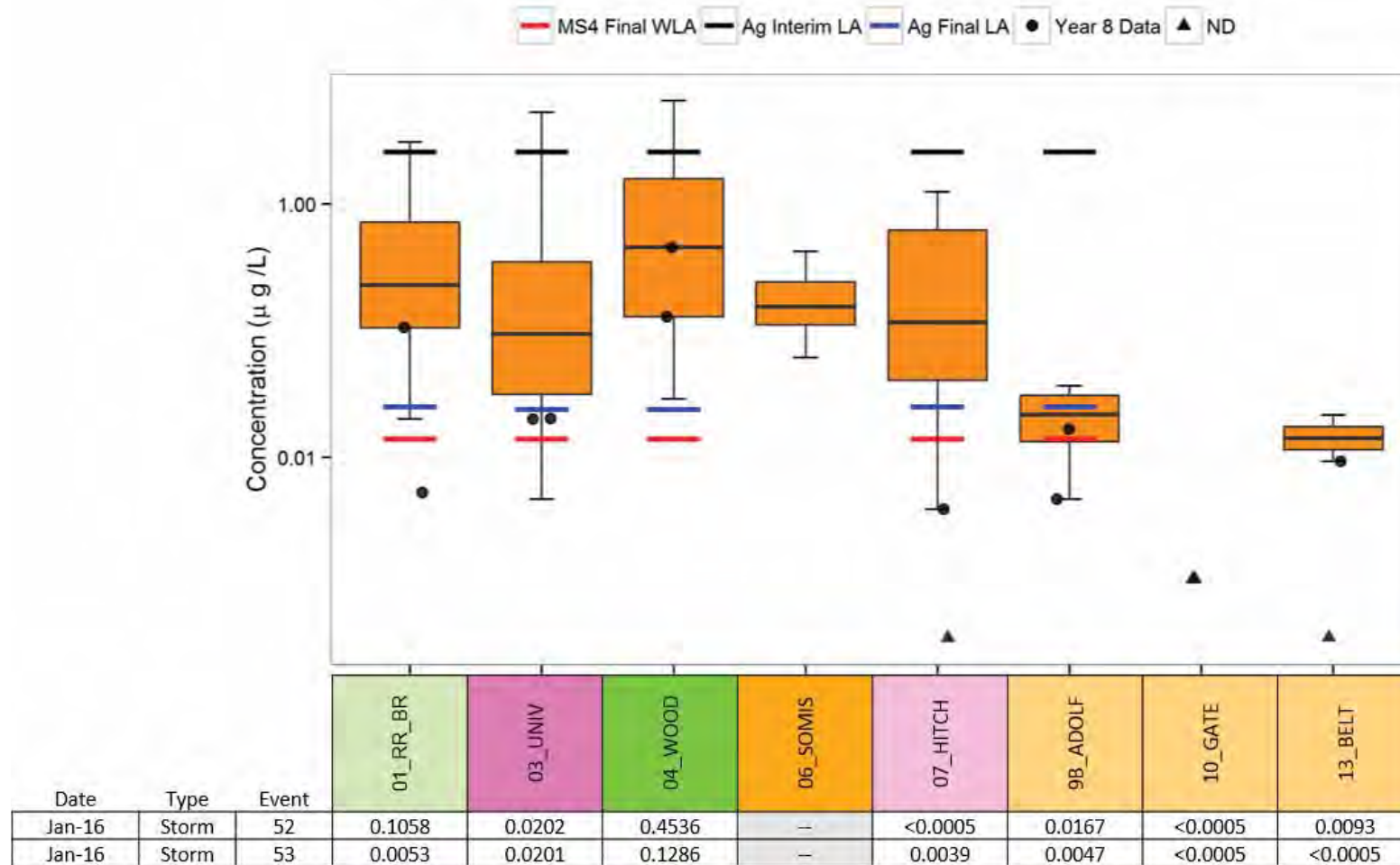


Figure 46. Chlorpyrifos Stormwater Concentrations in Receiving Water Sites: 2008-2016

Chlorpyrifos in Water from Urban, Ag, & POTW Sites: 2008-2016 Dry Weather

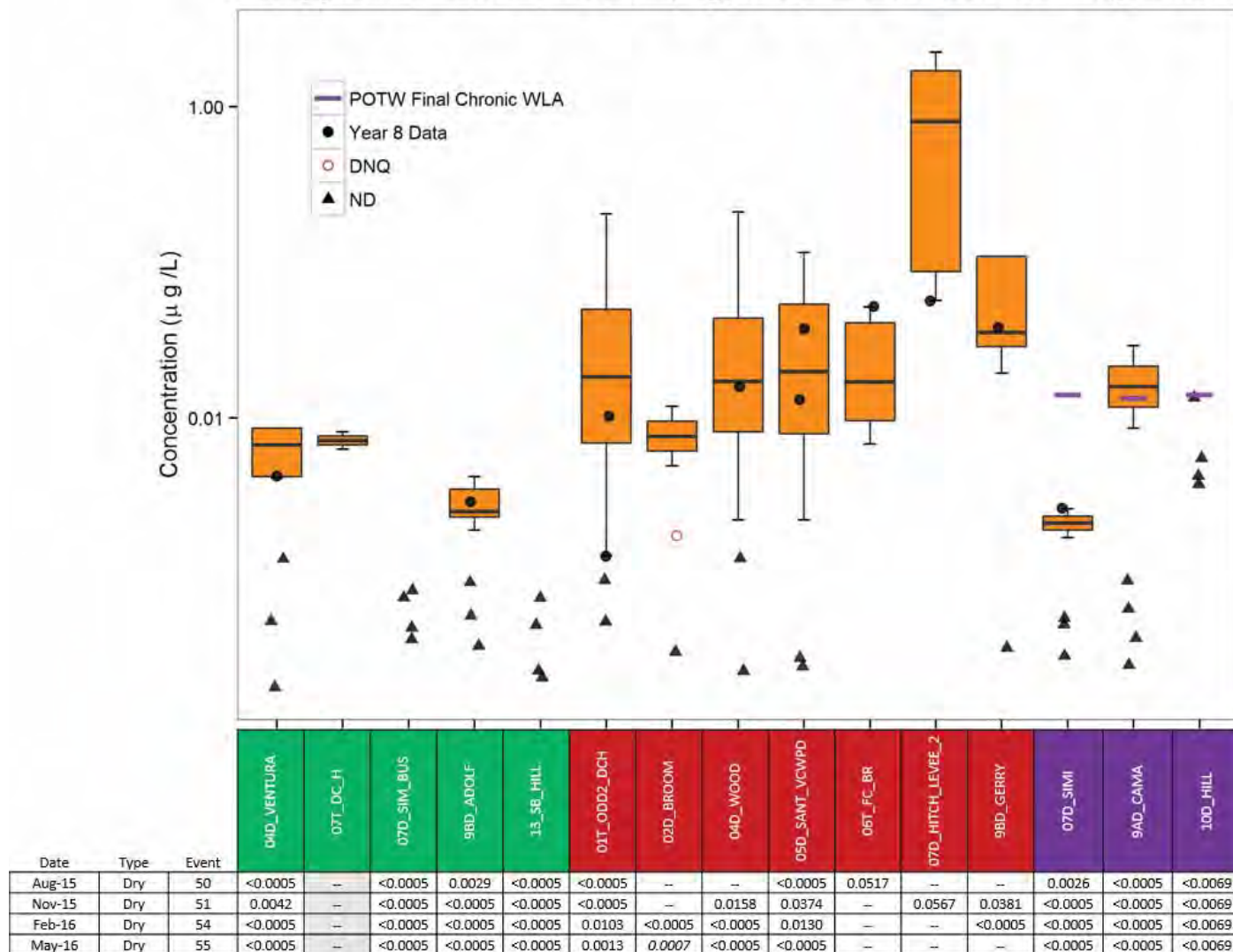


Figure 47. Chlorpyrifos Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2016

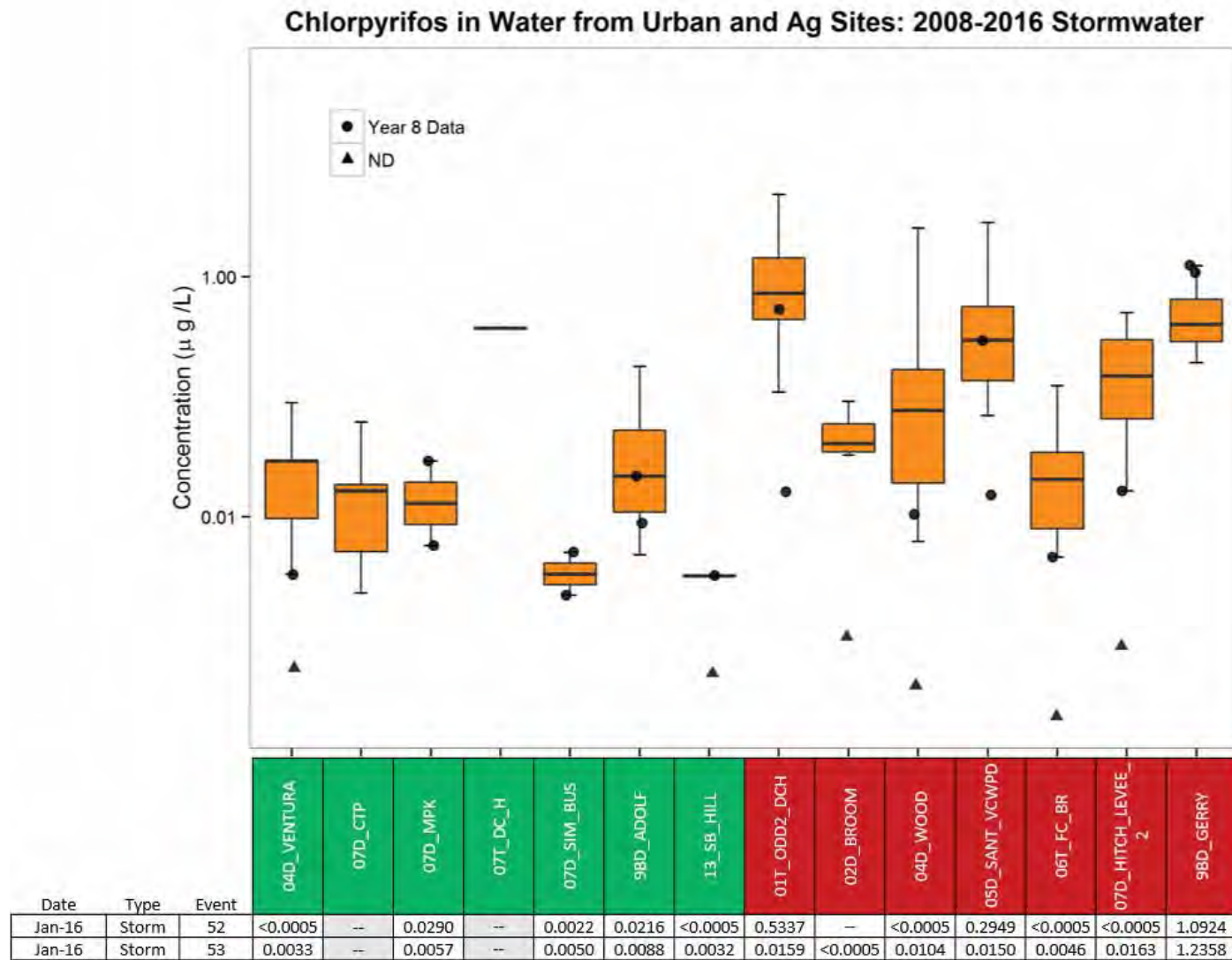


Figure 48. Chlorpyrifos Stormwater Concentrations in Urban and Ag Sites: 2008-2015

Diazinon in Receiving Water Sites: 2008-2016 Dry Weather

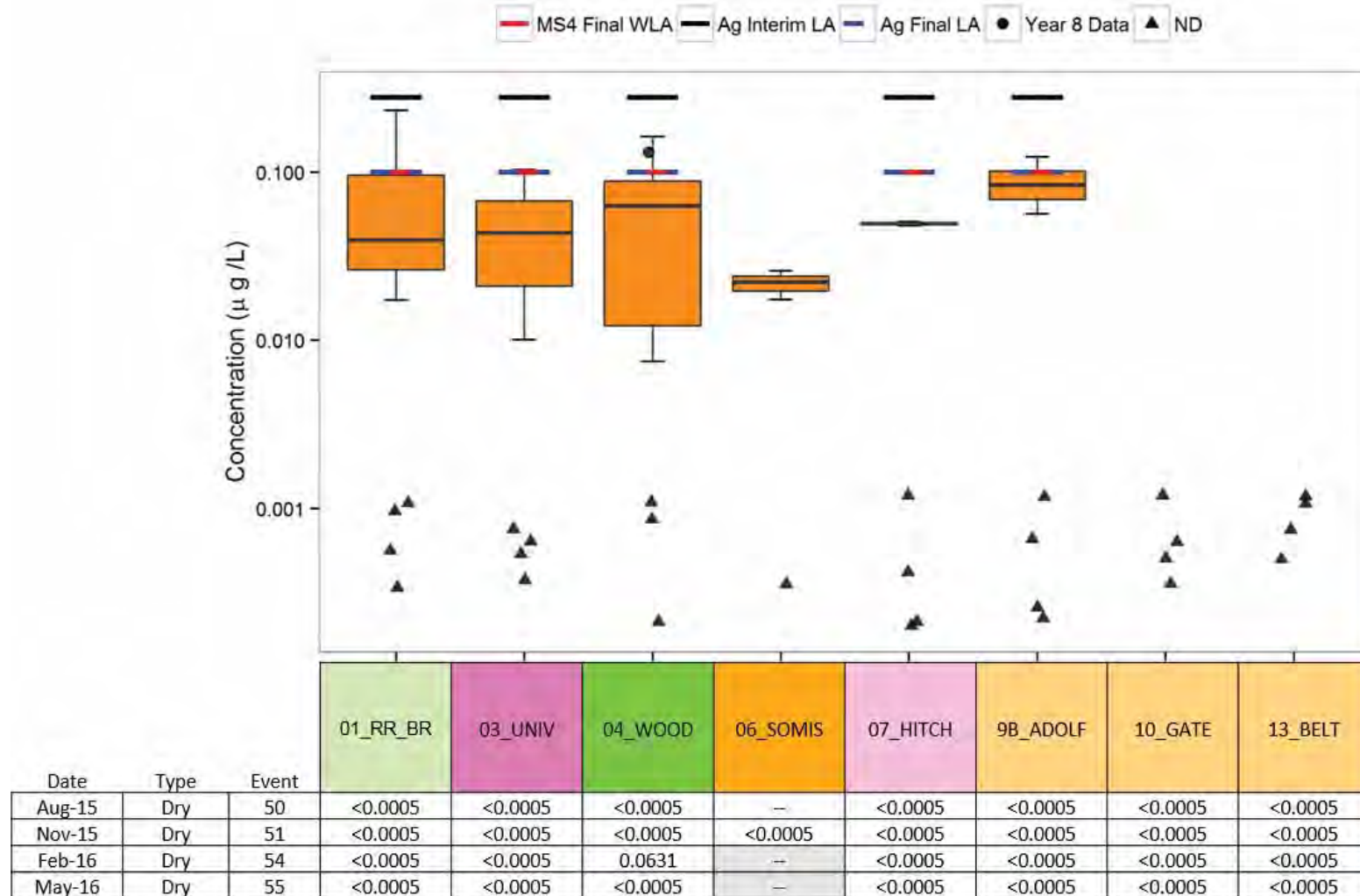


Figure 49. Diazinon Dry Weather Concentrations in Receiving Water Sites: 2008-2016

Diazinon in Receiving Water Sites: 2008-2016 Stormwater

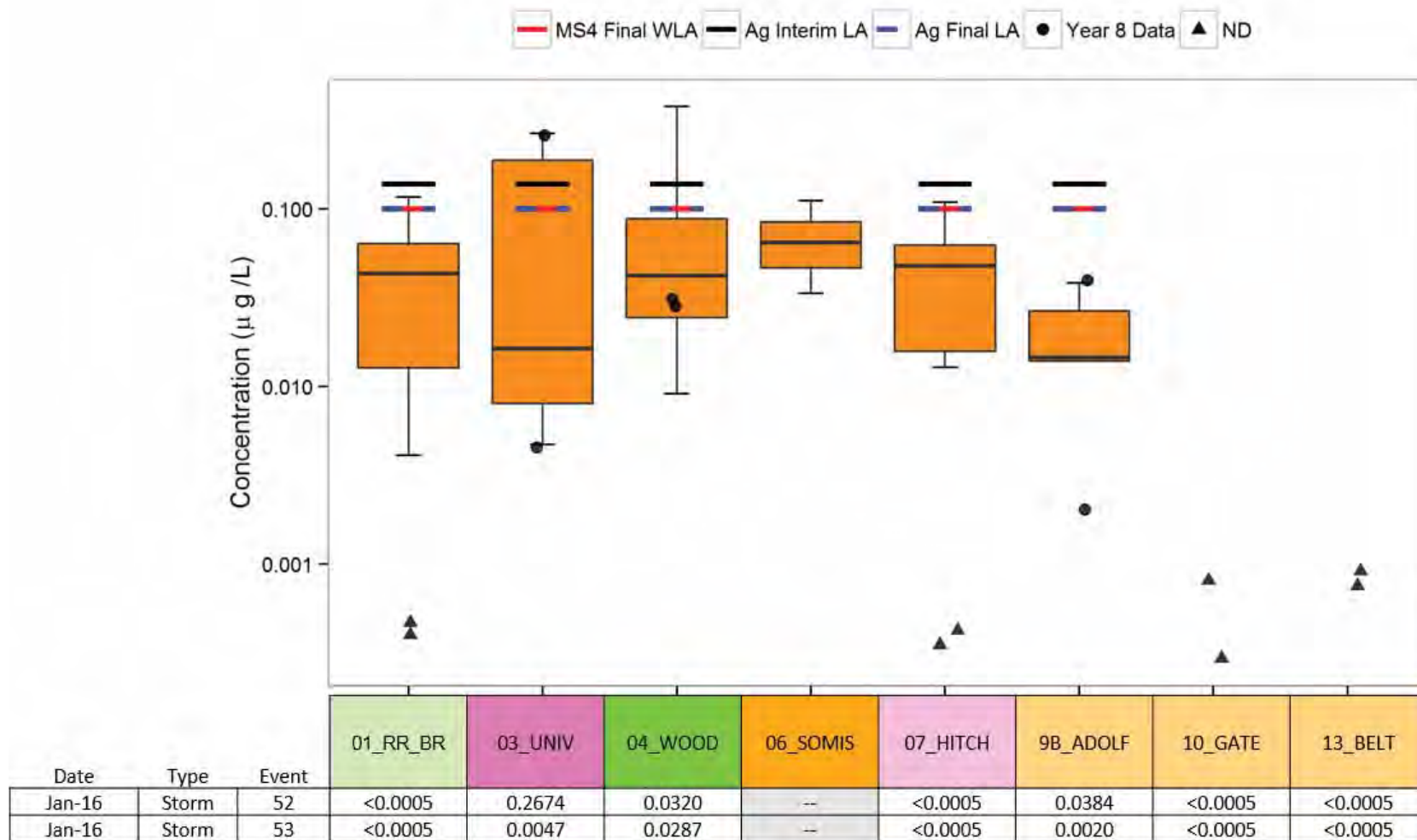


Figure 50. Diazinon Stormwater Concentrations in Receiving Water Sites: 2008-2016

Diazinon in Water from Urban, Ag, & POTW Sites: 2008-2016 Dry Weather

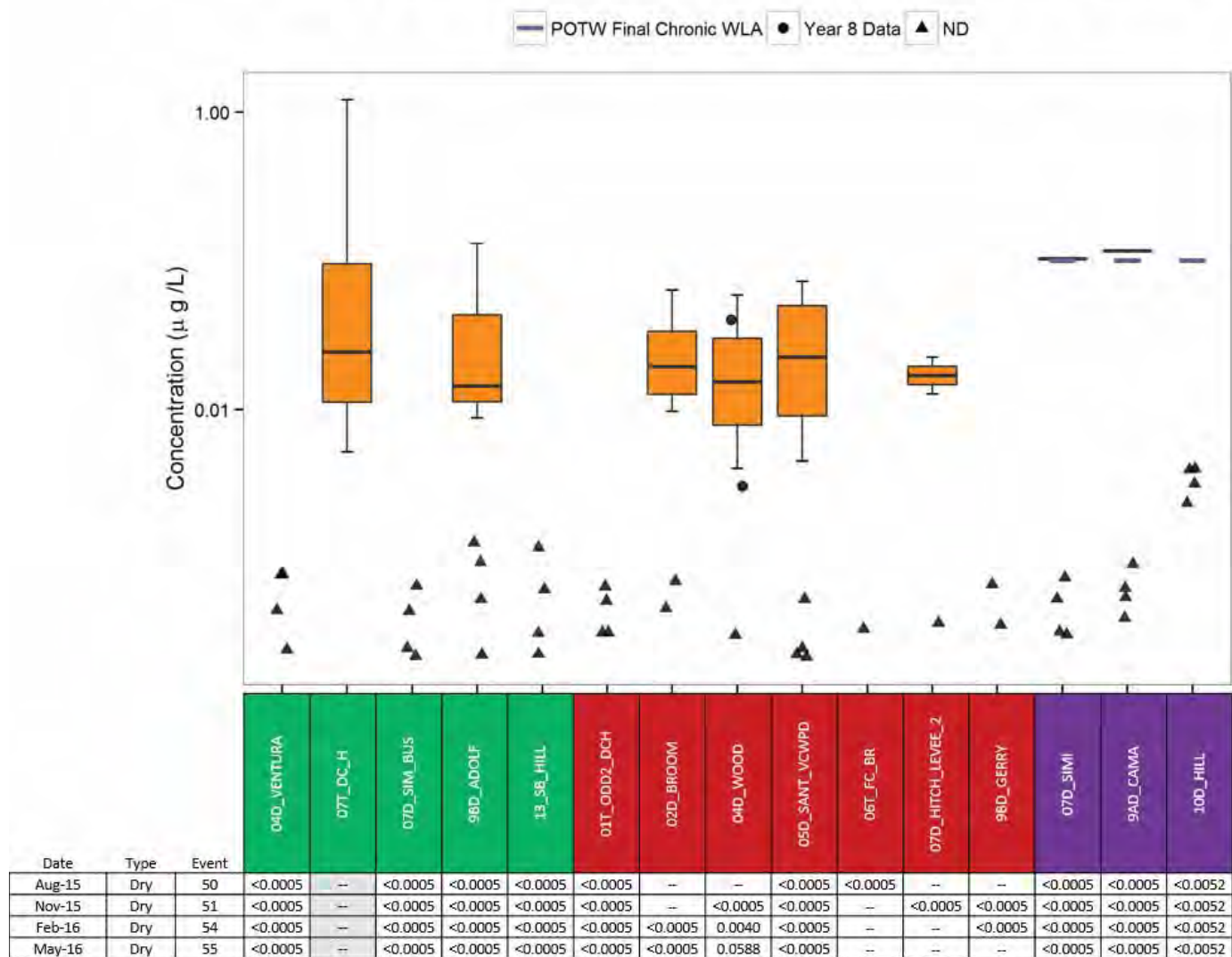


Figure 51. Diazinon Dry Weather Concentrations in Urban, Ag, and POTW Sites: 2008-2016

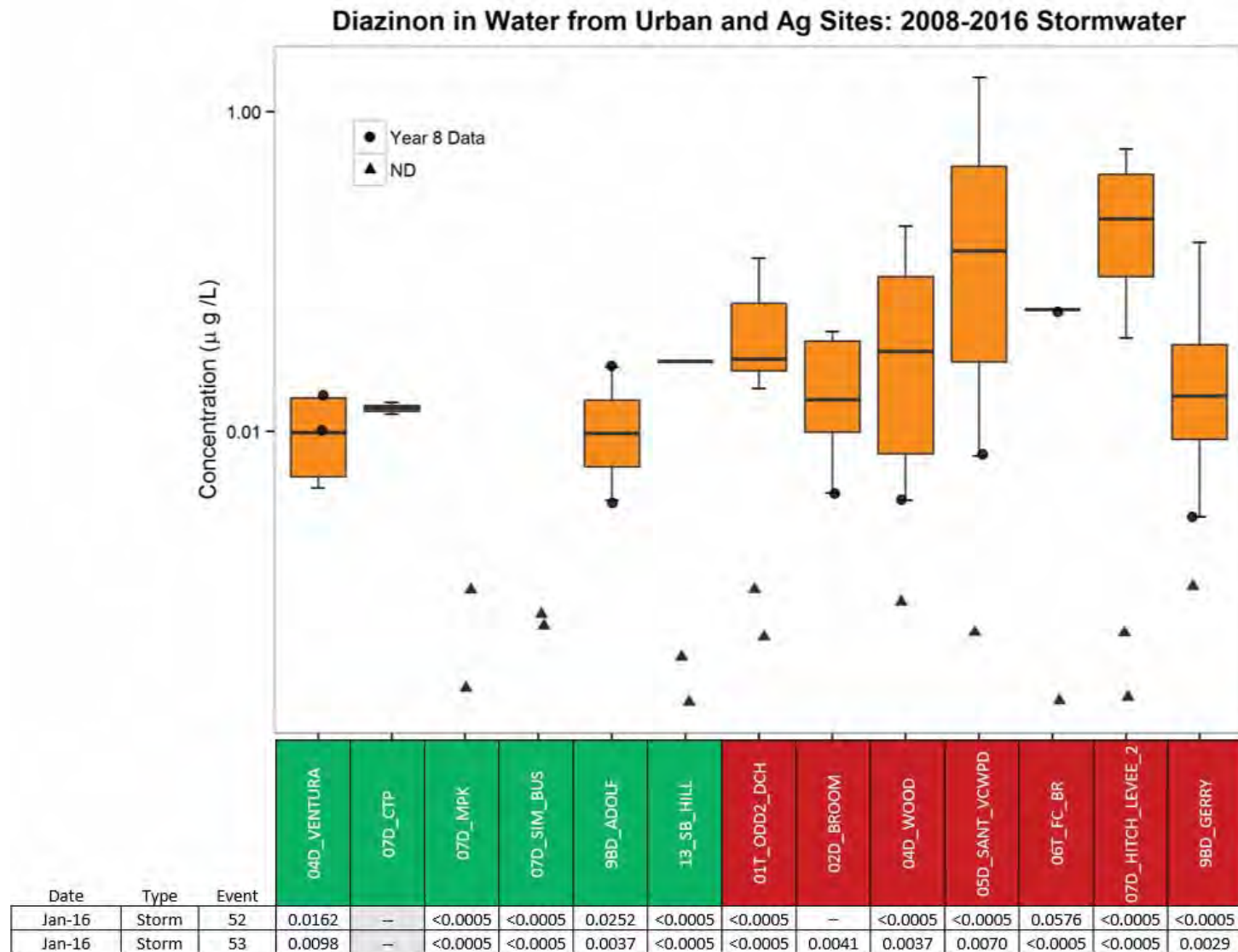


Figure 52. Diazinon Stormwater Concentrations in Urban and Ag Sites: 2008-2016

NUTRIENTS TMDL

Final targets and allocations are effective for the Nutrients TMDL. The applicable targets for each monitoring site are presented in the figures below. Data collected during year eight, which is the reporting period for this document, have been overlain on the box plots as circles. The box plots include all of the data collected during this program (2008-2016). This was done to allow for easy comparison between recent data and what have been collected overall. The eighth year data are presented in tabular form below each box plot. Bolded values in the tables within each figure indicate the concentration was above the applicable limits for that constituent. Italicized values in the tables within each figure indicate the concentration was DNQ. Values in the tables within each figure with a “<” preceding them, indicate the constituent was ND at the MDL for that constituent. Values identified as “--” in the tables indicate no samples were collected at those sites for those events.

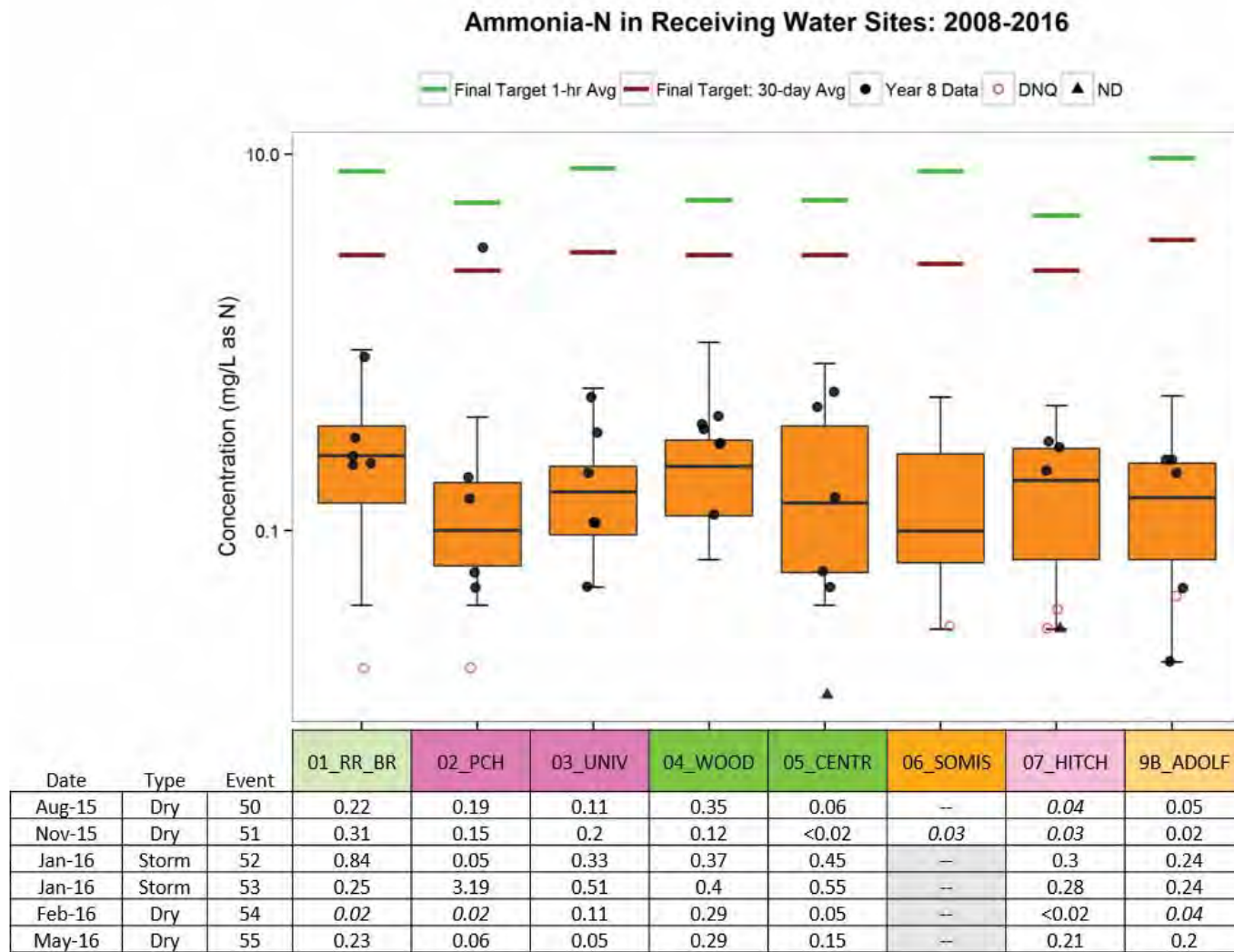


Figure 53. Ammonia-N Concentrations in Receiving Water Sites: 2008-2016

Ammonia-N in Water from Ag & POTW Sites: 2008-2016

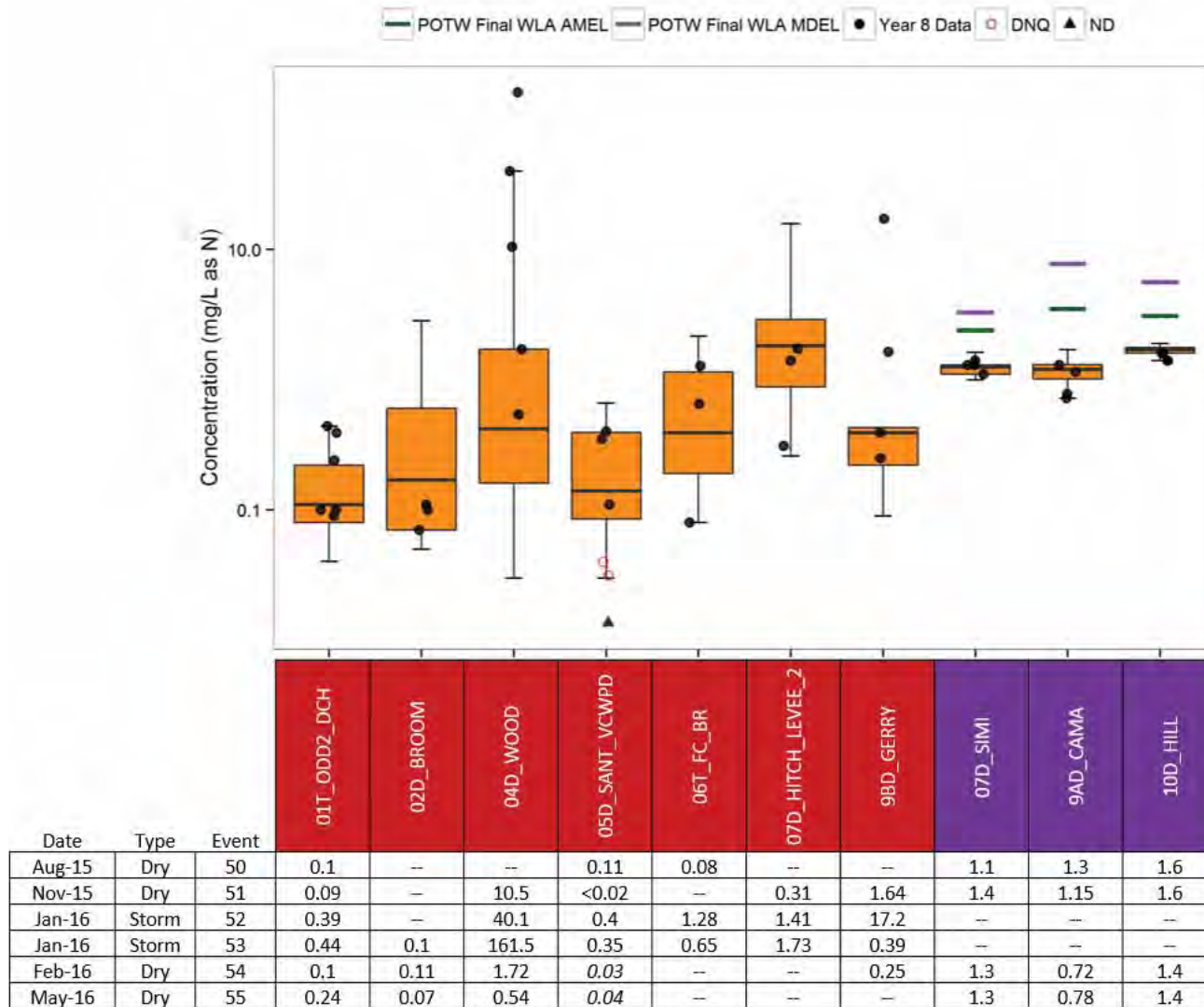


Figure 54. Ammonia-N Concentrations in Ag and POTW Sites: 2008-2016

Nitrate-N in Receiving Water Sites: 2008-2016

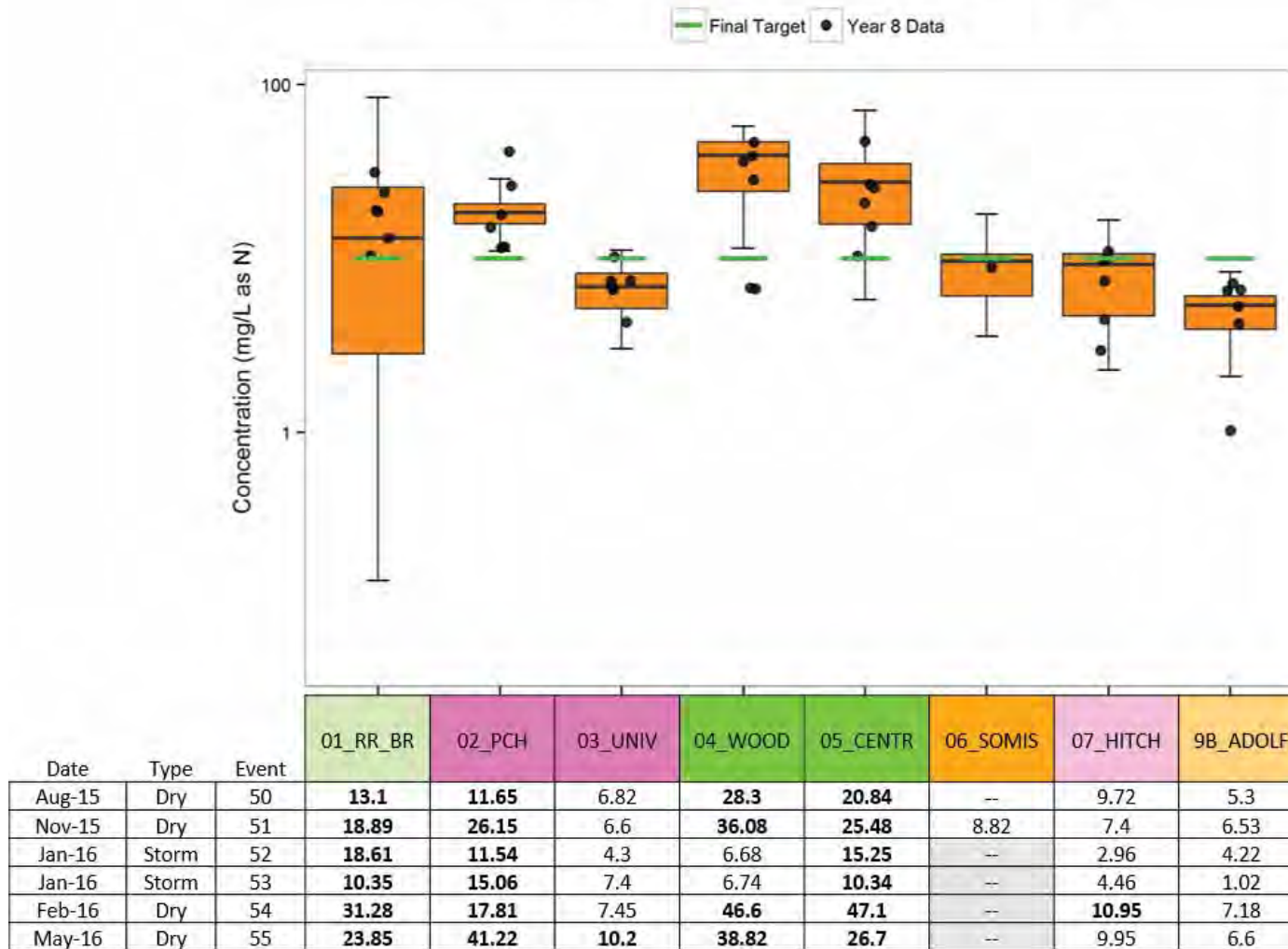


Figure 55. Nitrate-N Concentrations in Receiving Water Sites: 2008-2016

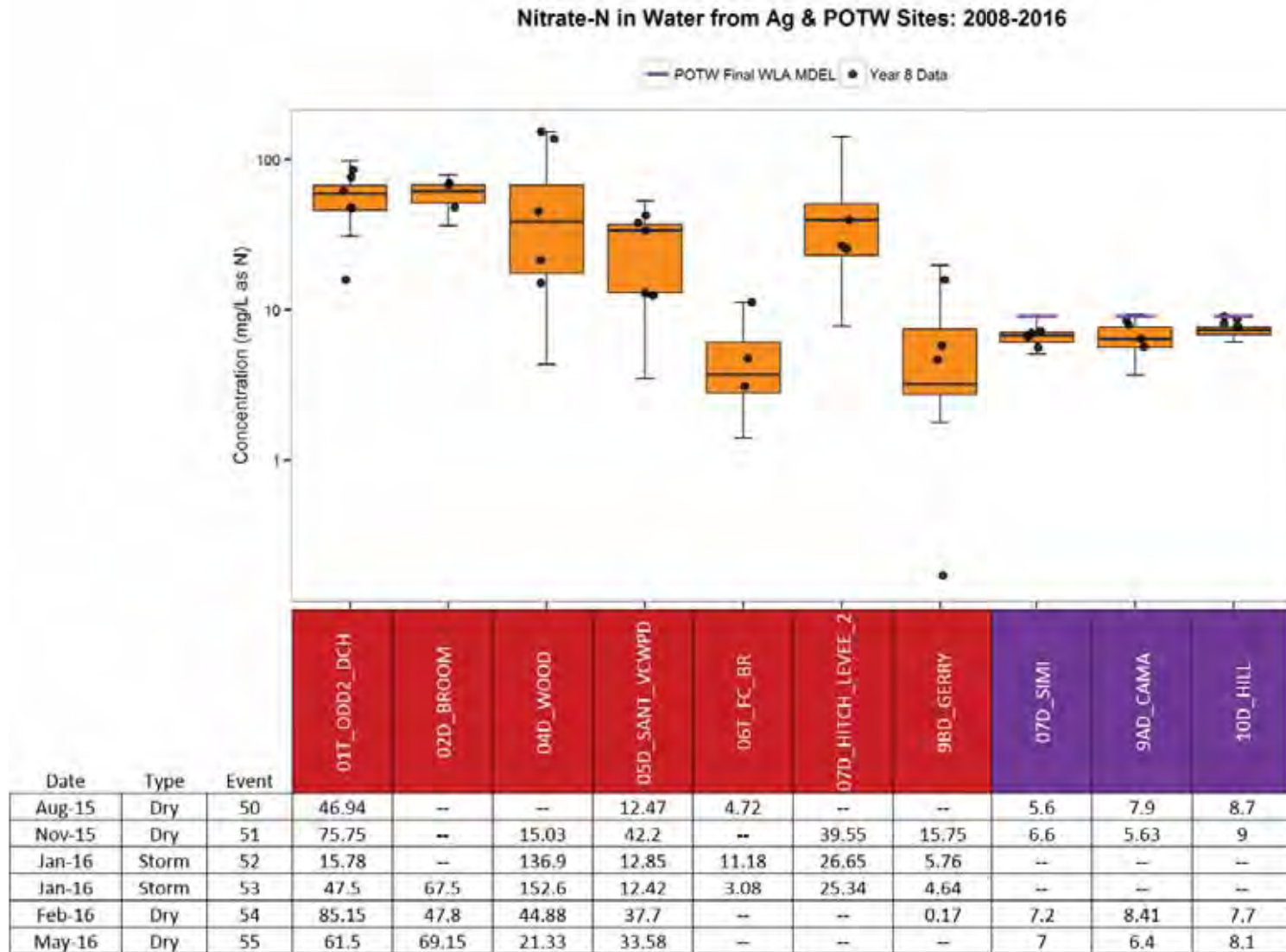


Figure 56. Nitrate-N Concentrations in Ag and POTW Sites: 2008-2016

Nitrite-N in Receiving Water Sites: 2008-2016

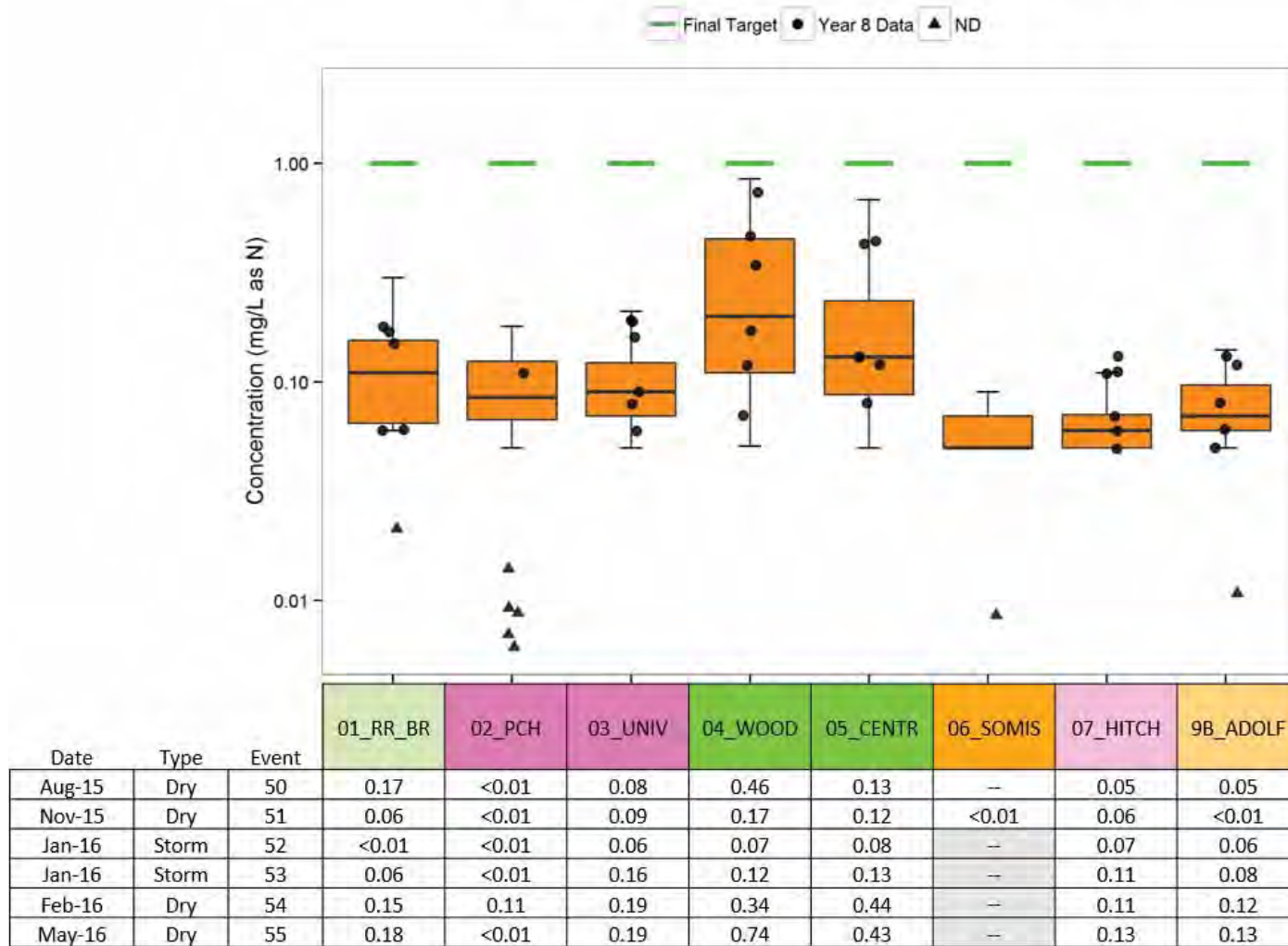


Figure 57. Nitrite-N Concentrations in Receiving Water Sites: 2008-2016

Nitrite-N in Water from Ag & POTW Sites: 2008-2016

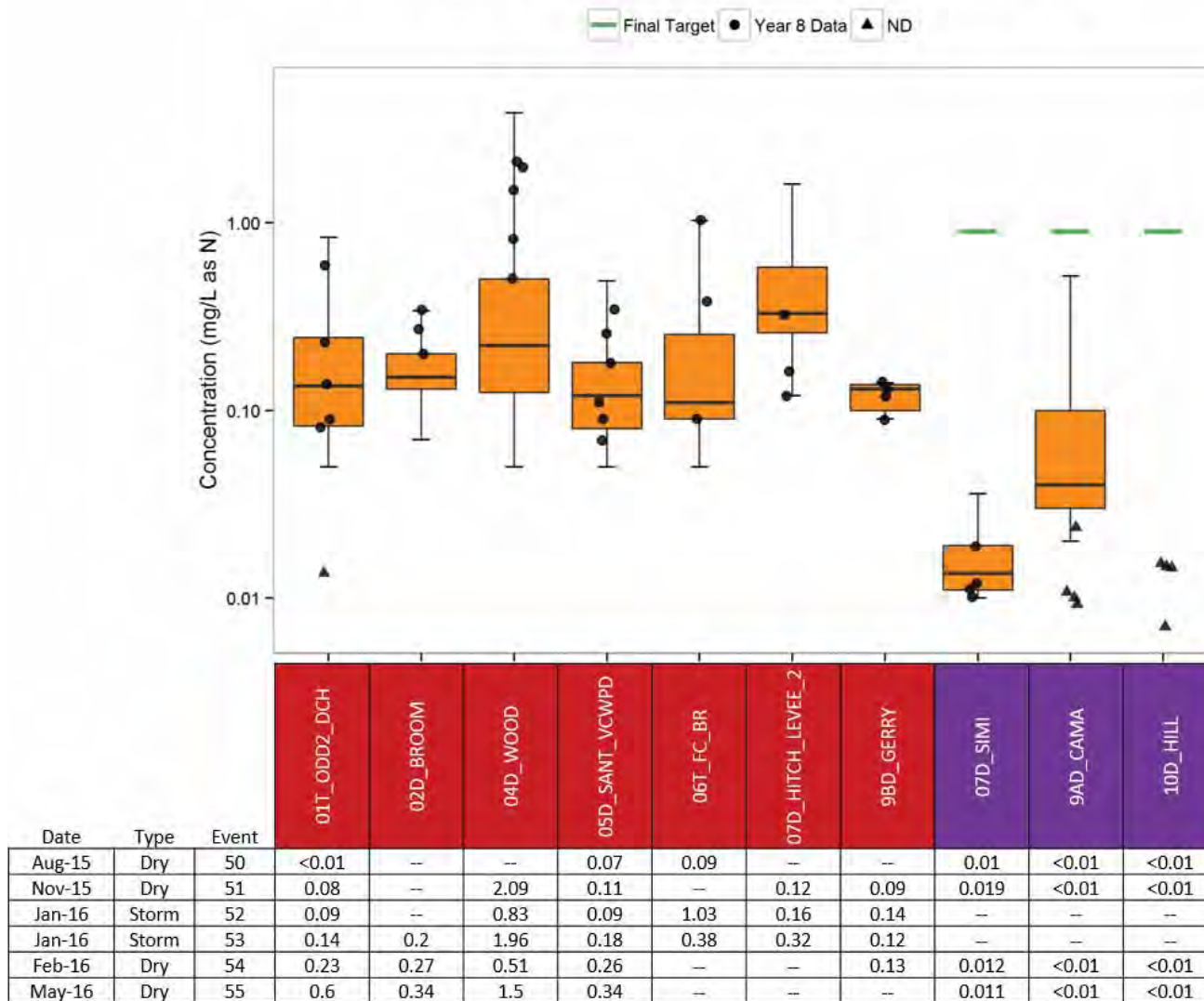


Figure 58. Nitrite-N Concentrations in Ag and POTW Sites: 2008-2016

Nitrate-N + Nitrite-N in Receiving Water Sites: 2008-2016

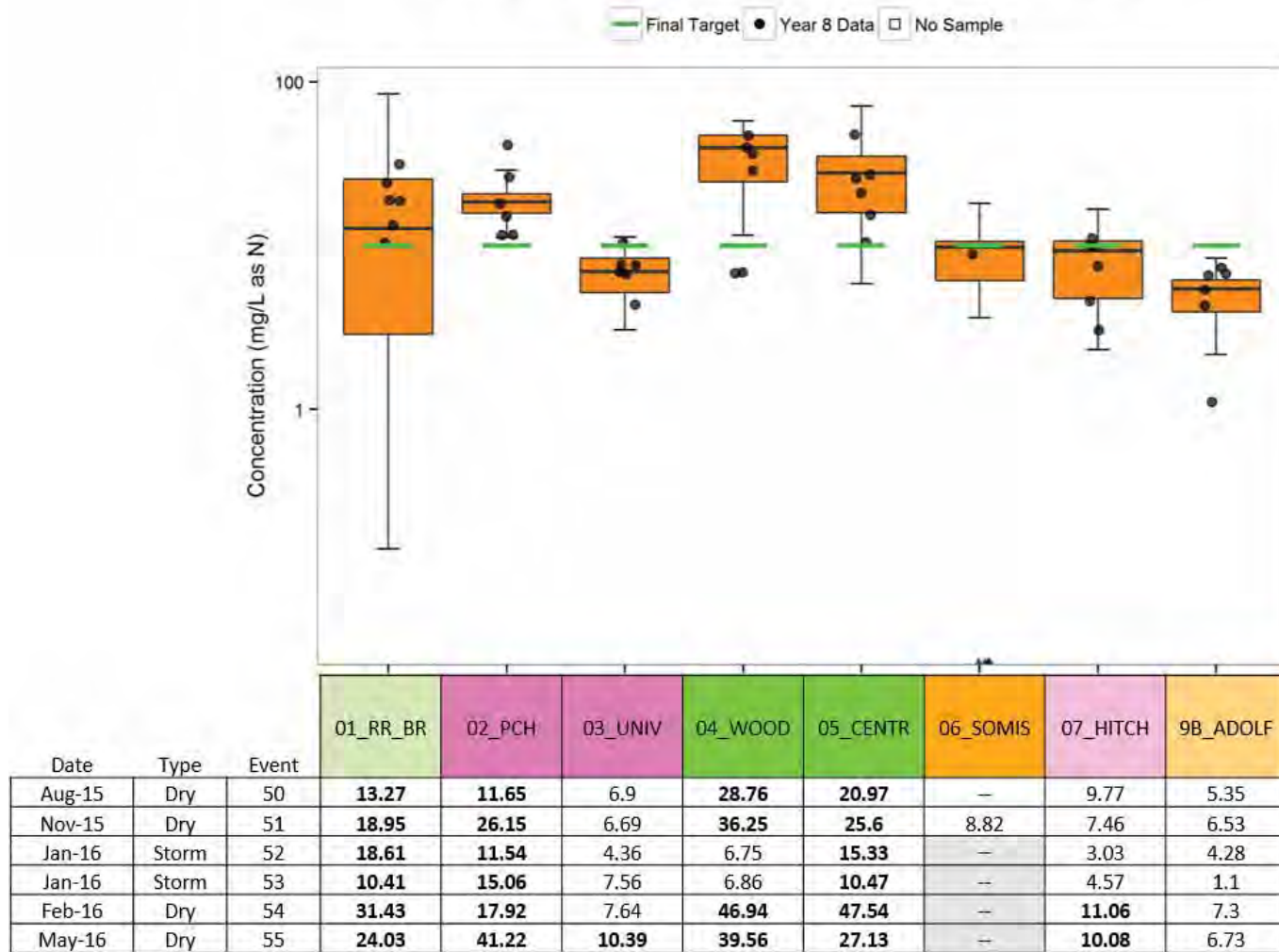


Figure 59. Nitrate-N + Nitrite-N Concentrations in Receiving Water Sites: 2008-2016

Nitrate-N + Nitrite-N in Water from Ag & POTW Sites: 2008-2016

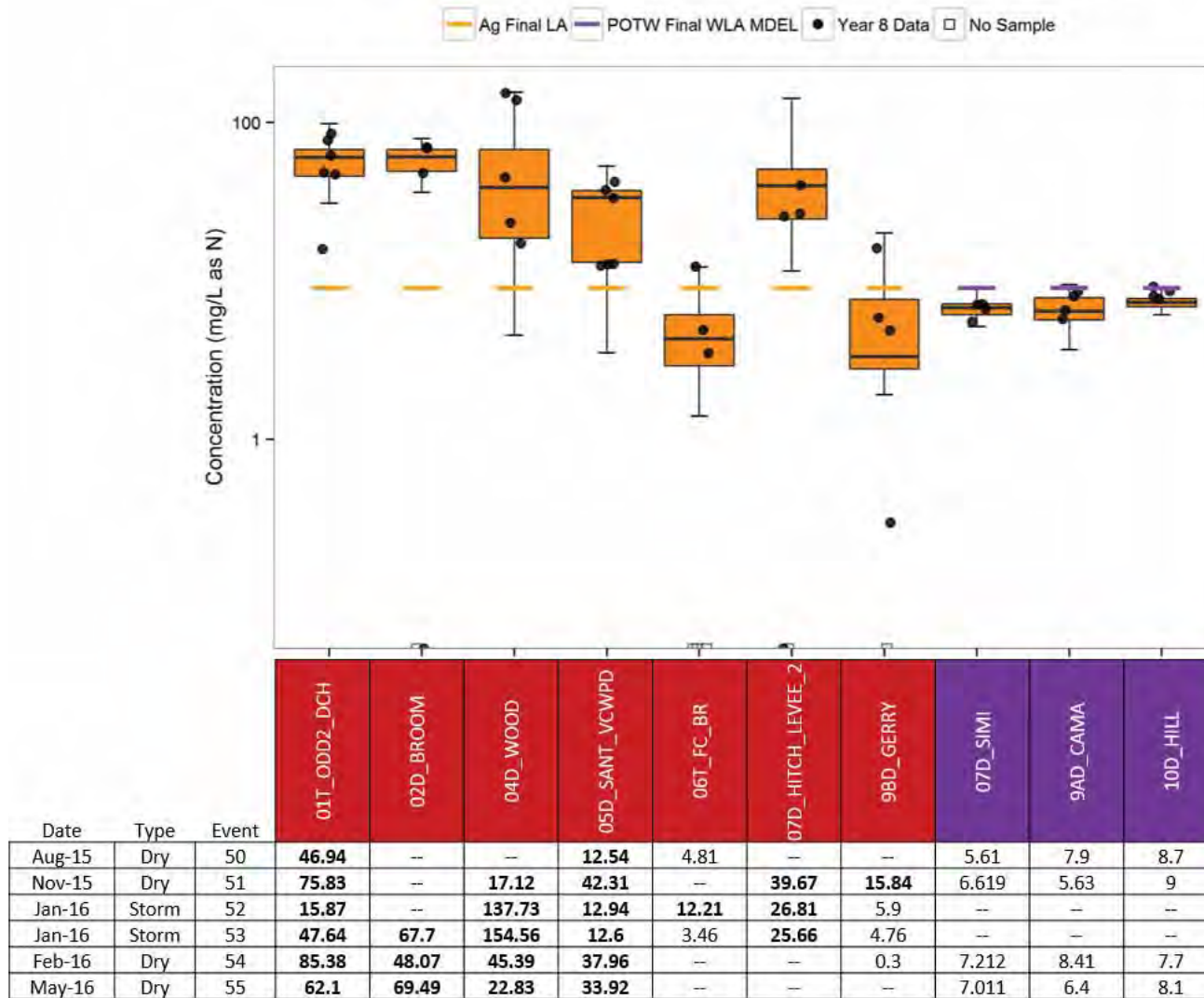


Figure 60. Nitrate-N + Nitrite-N Concentrations in Ag and POTW Sites: 2008-2016

SALTS TMDL

For the Salts TMDL, compliance with interim dry weather salt allocations is determined using monthly mean salt concentrations for dry weather developed from the time-series of data collected at receiving water sites. Bolded values in the tables within each figure indicate the concentration was above the interim MS4 wasteload allocation and the interim load allocation for that constituent. Italicized values in the tables within each figure indicate the concentration was above the interim MS4 wasteload allocation for that constituent.

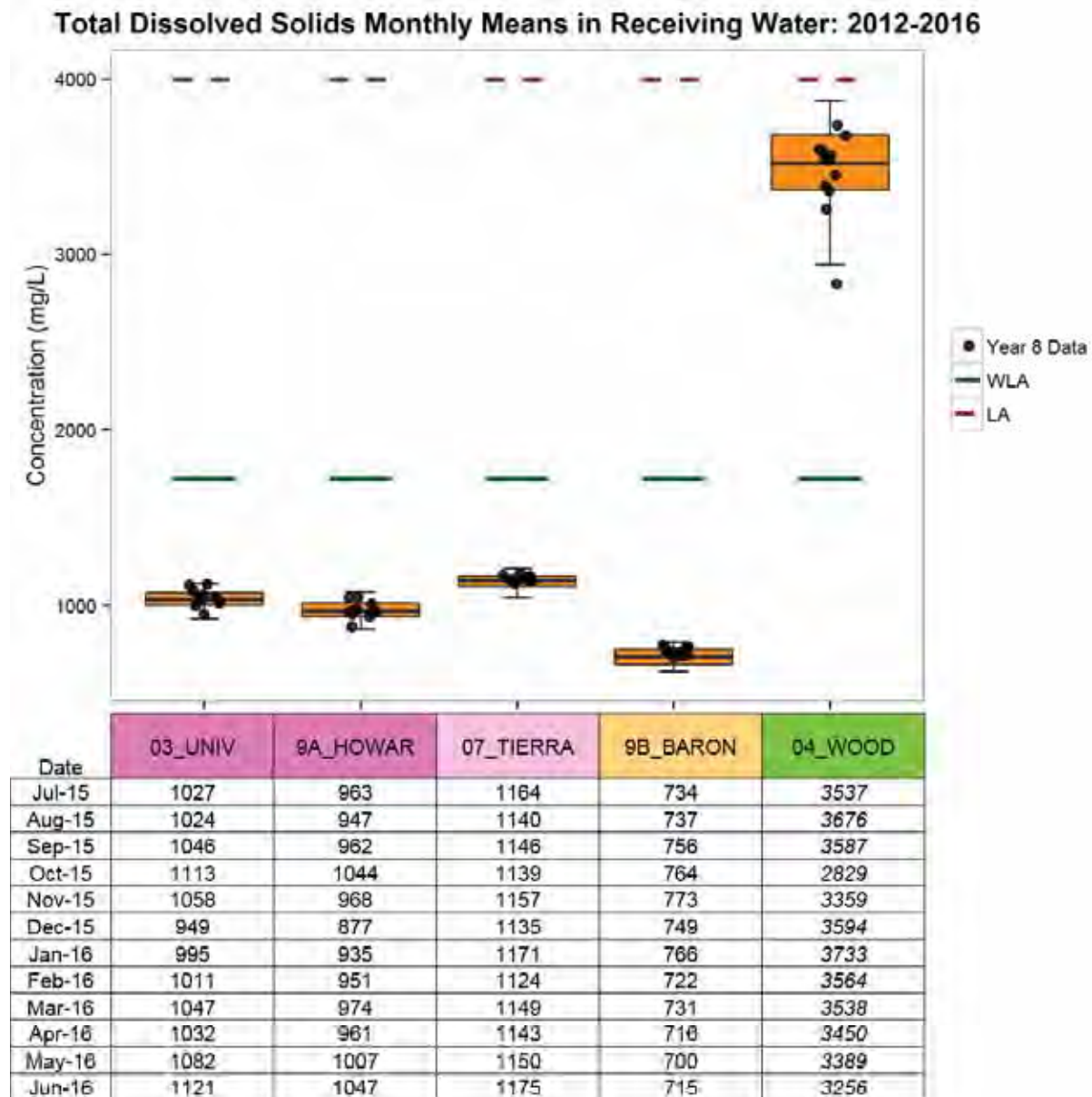


Figure 61. TDS Monthly Means for Receiving Water Sites Collected During Dry Weather

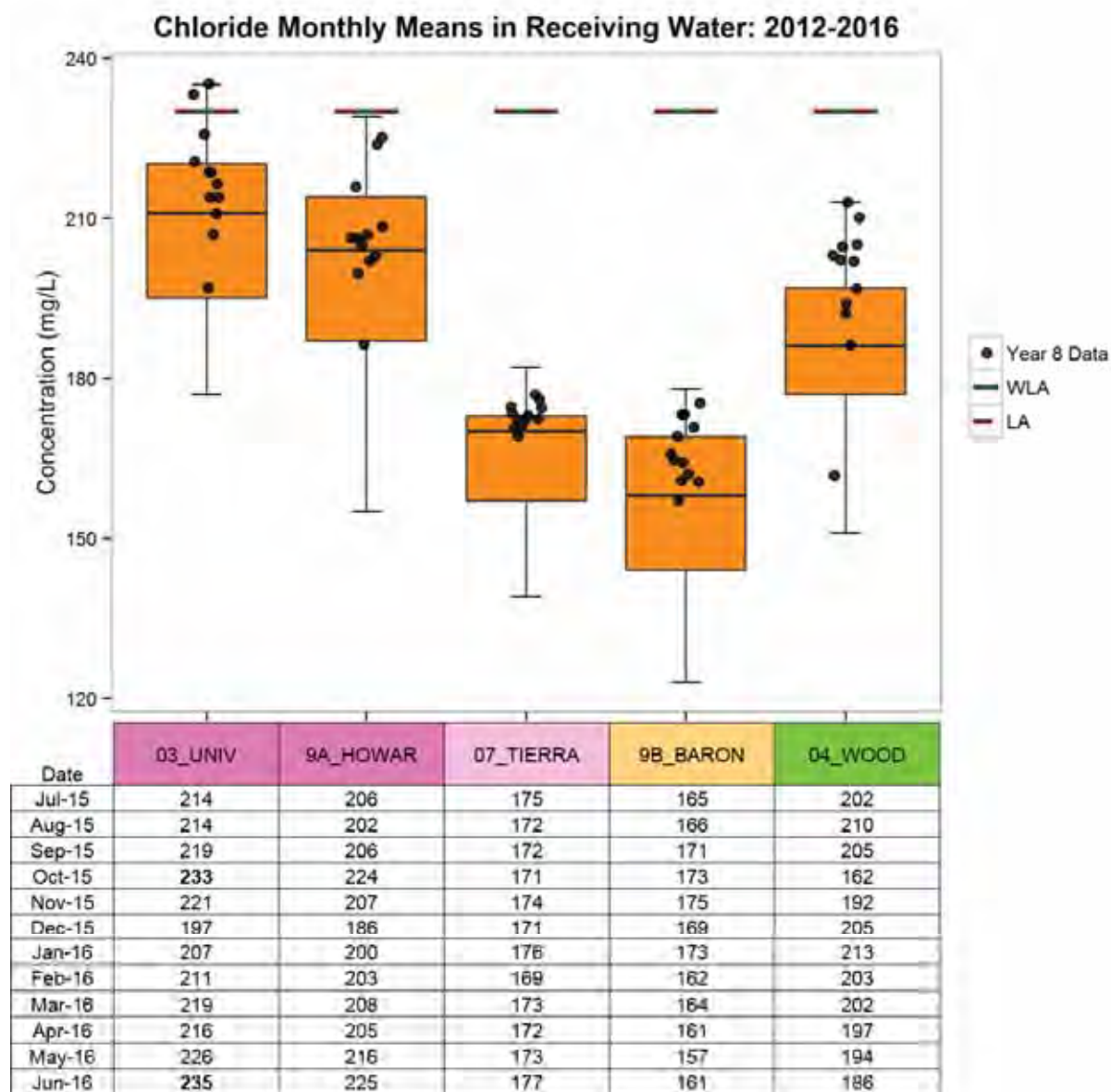


Figure 62. Chloride Monthly Means for Receiving Water Sites Collected During Dry Weather

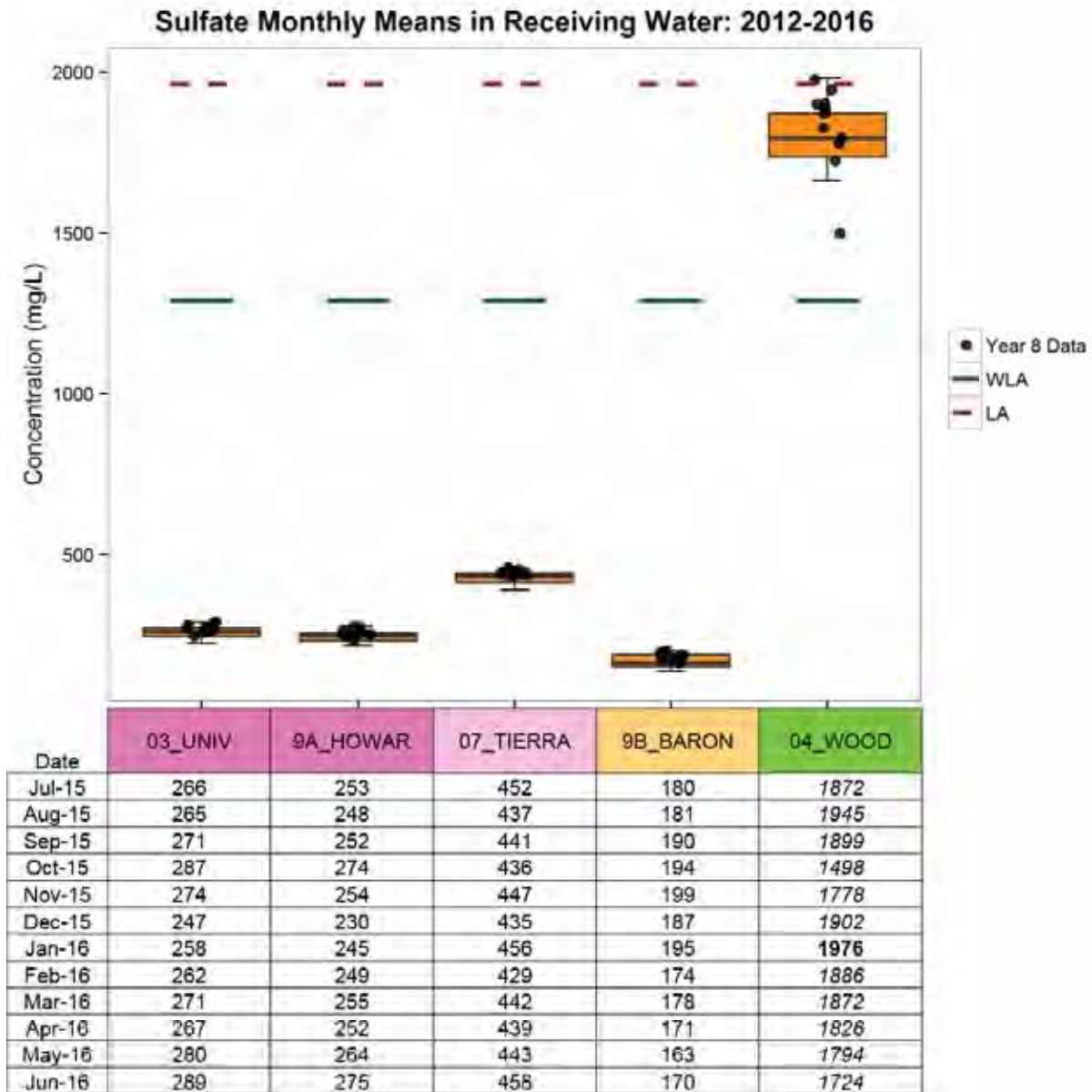


Figure 63. Sulfate Monthly Means for Receiving Water Sites Collected During Dry Weather

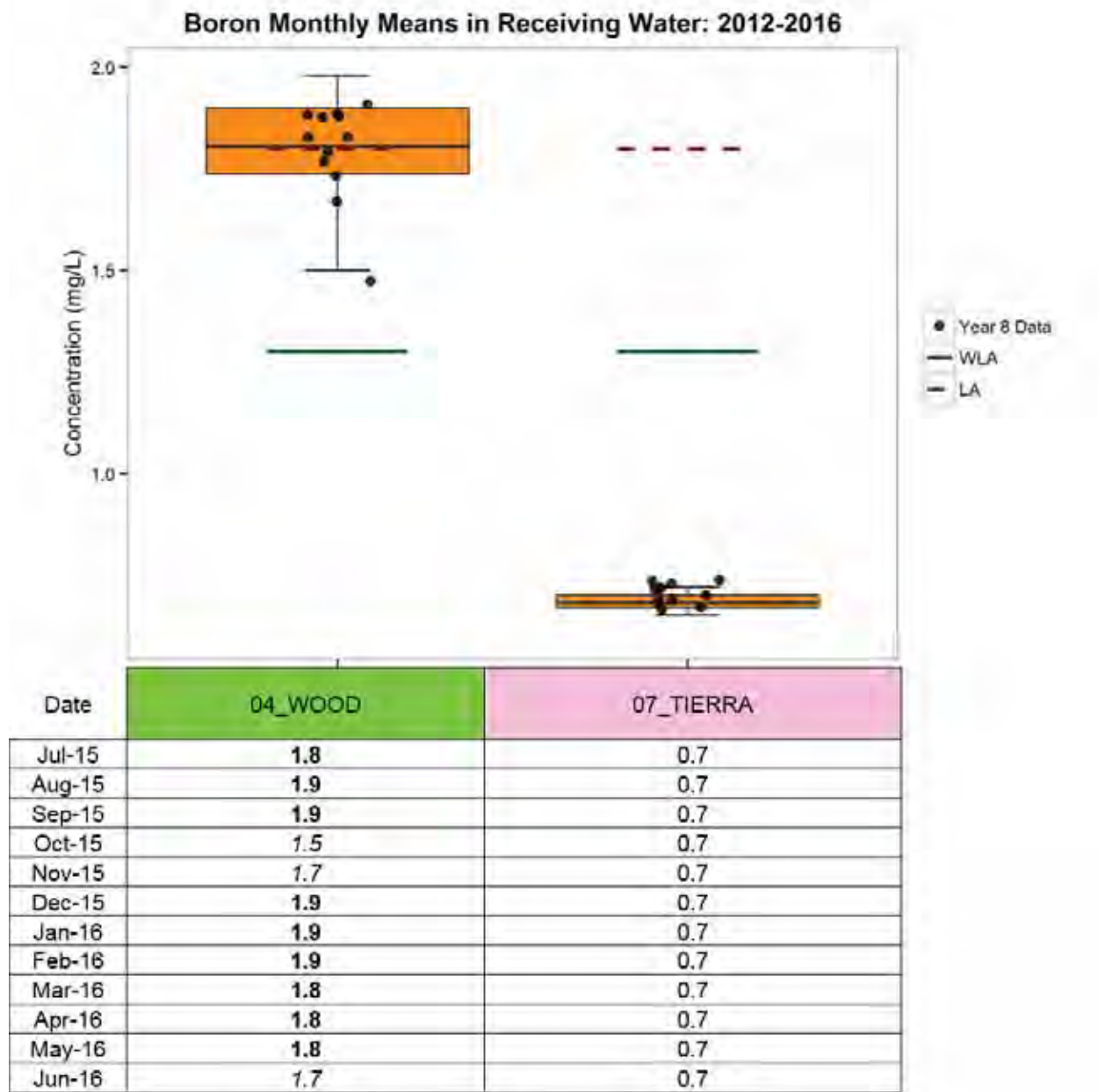


Figure 64. Boron Monthly Means for Receiving Water Sites Collected During Dry Weather

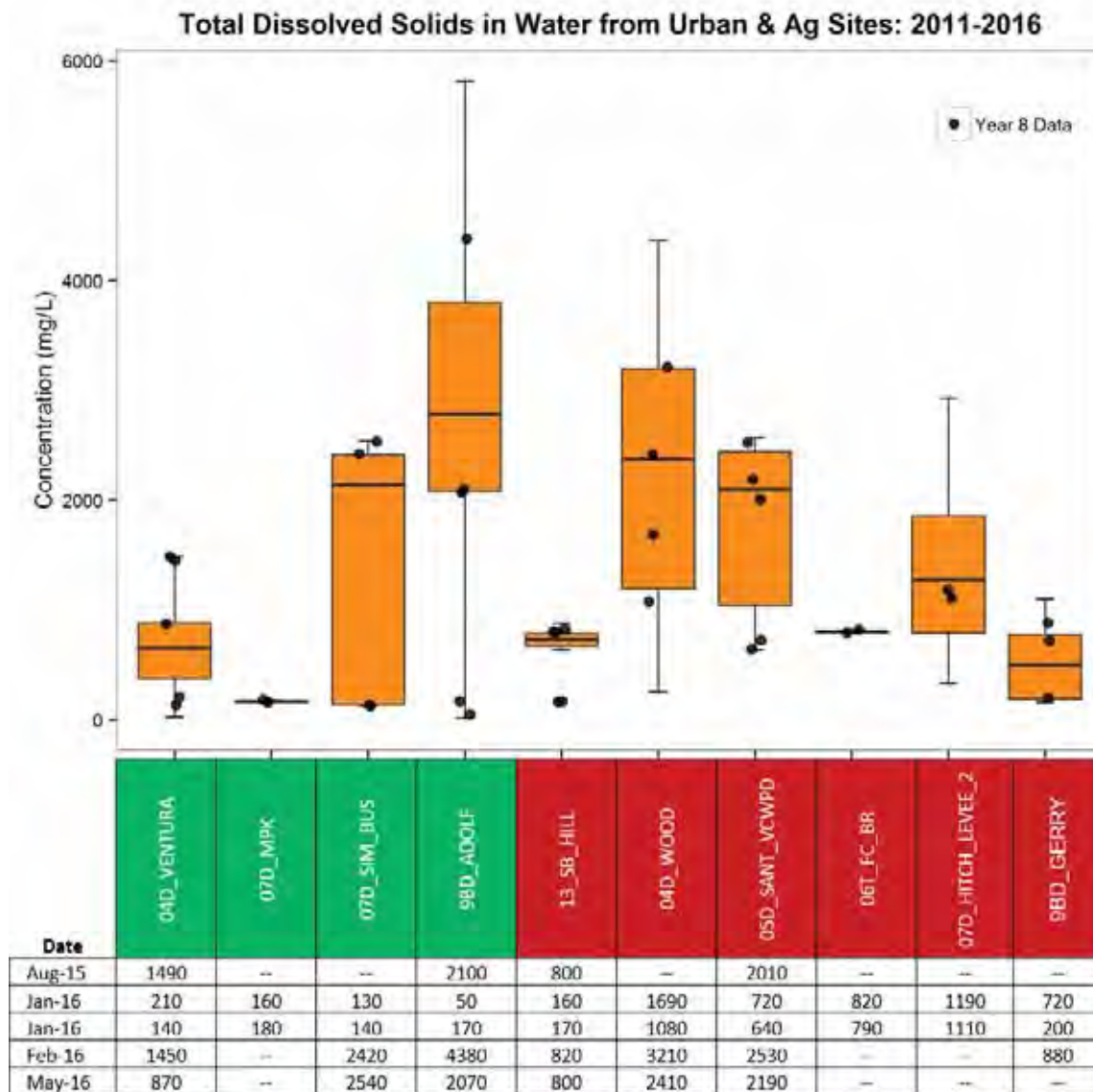


Figure 65. Total Dissolved Solids in Water from Urban and Ag Sites: 2011-2016

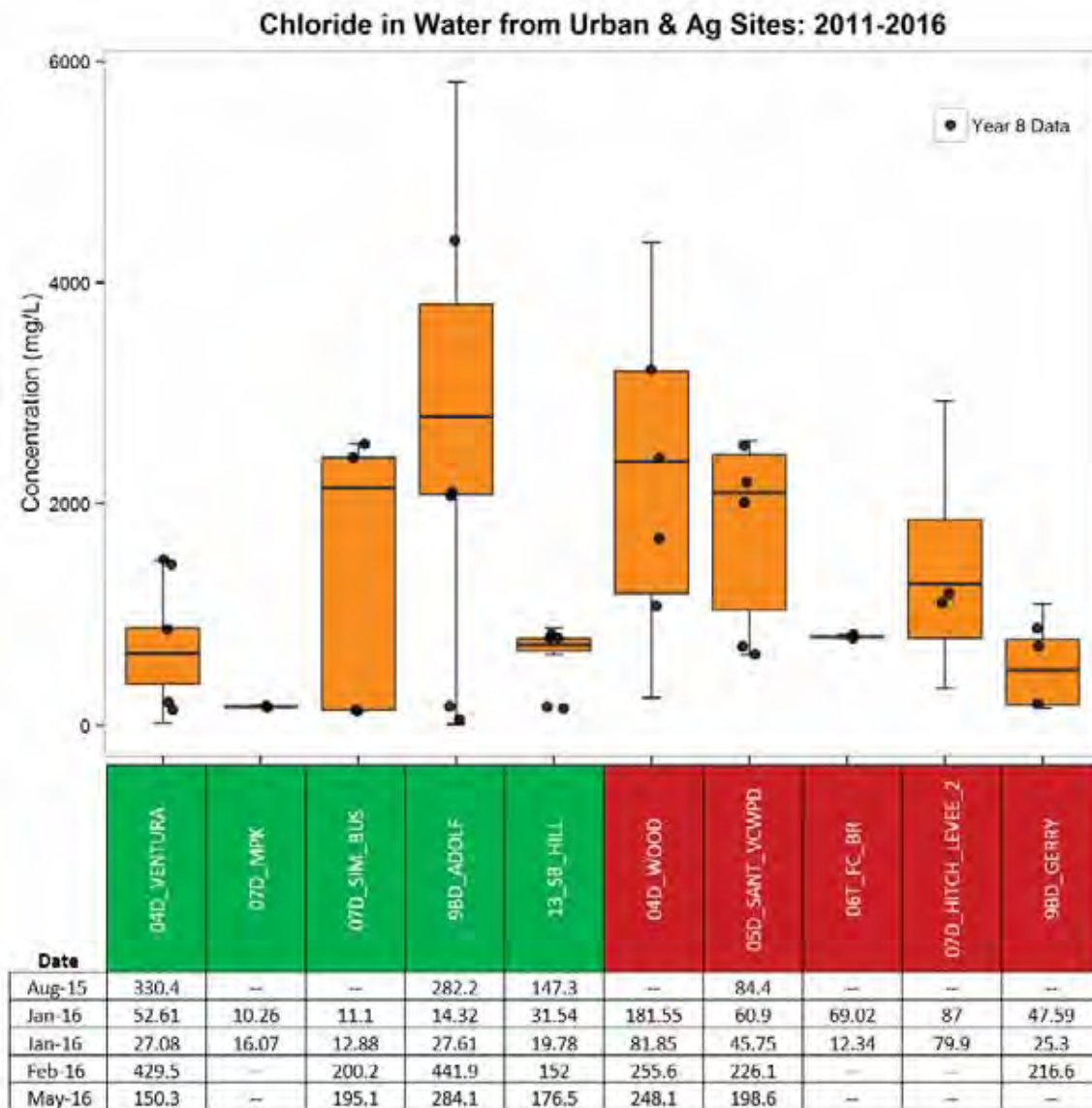


Figure 66. Chloride in Water from Urban & Ag Sites: 2011-2016

Sulfate in Water from Urban & Ag Sites: 2011-2016

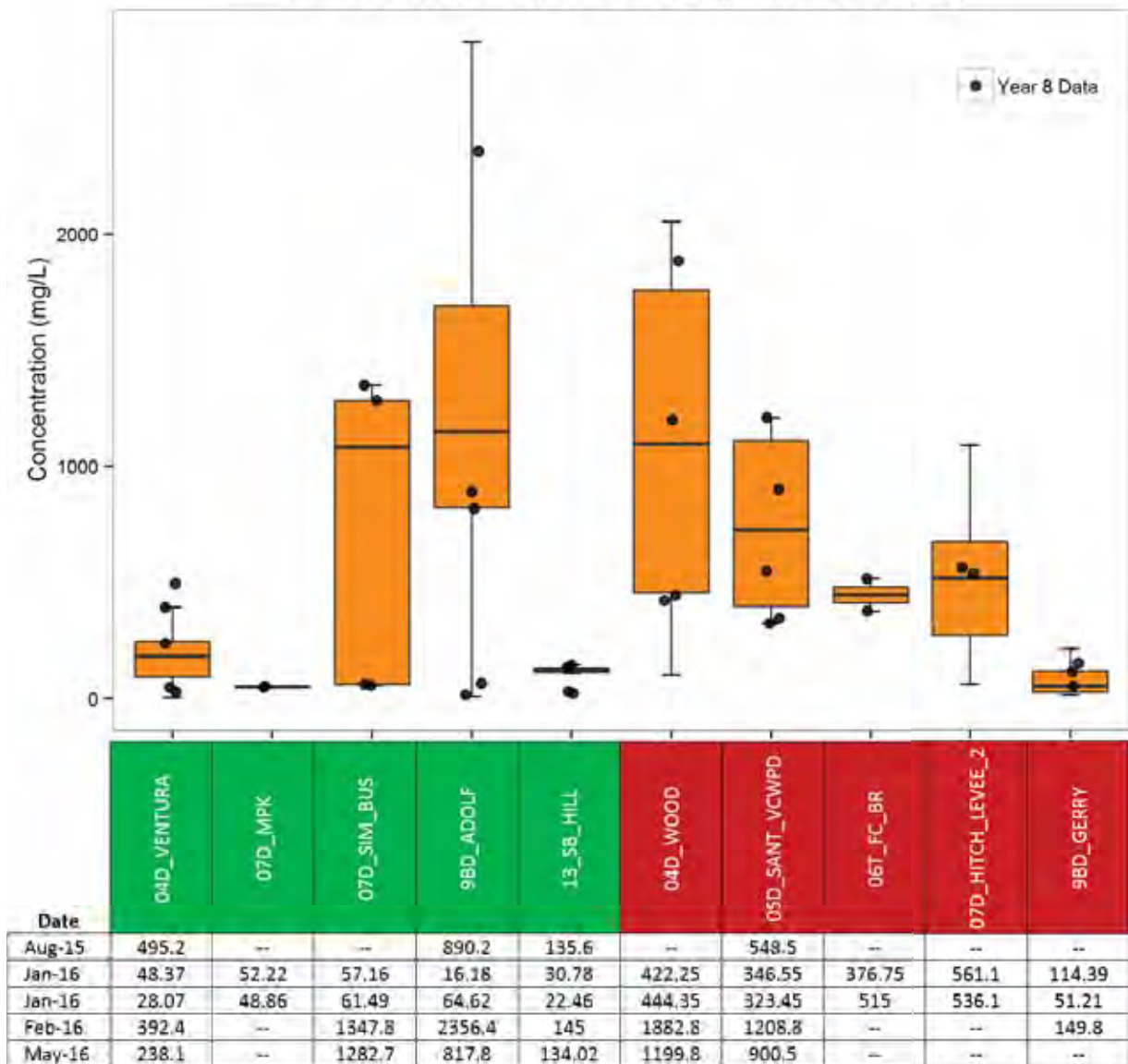


Figure 67. Sulfate in Water from Urban & Ag Sites: 2011-2016

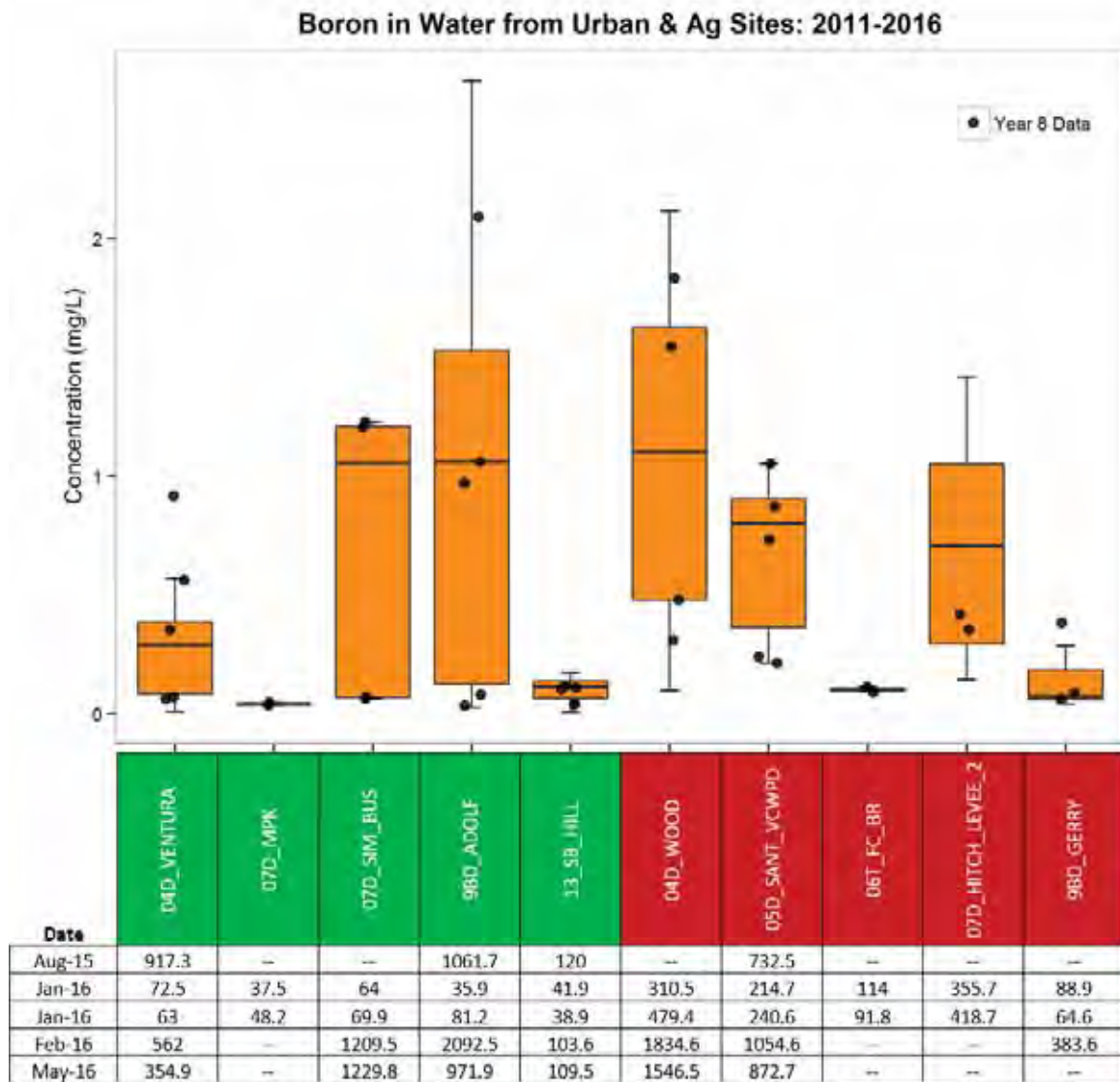


Figure 68. Boron in Water from Urban & Ag Sites: 2011-2016

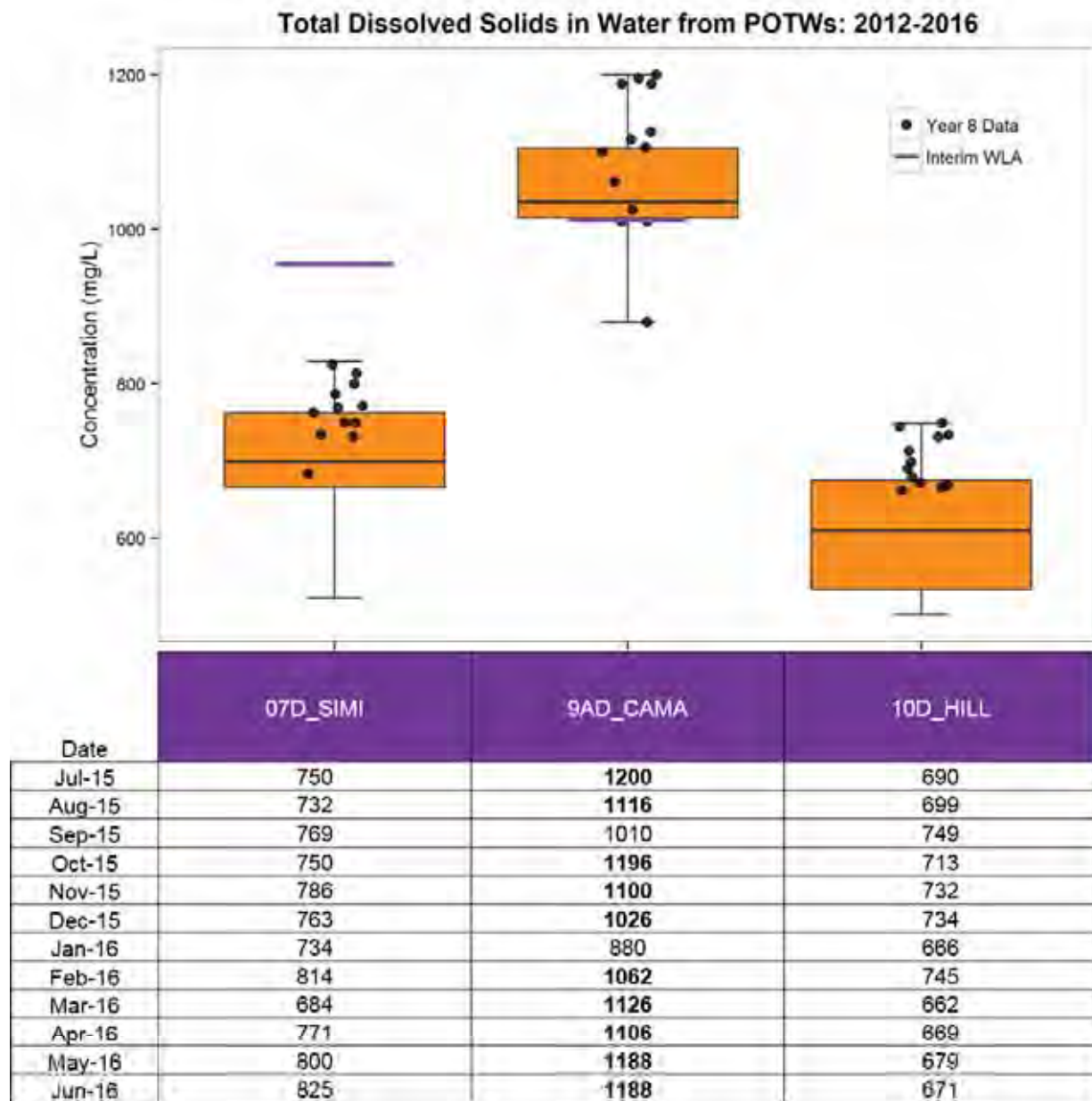


Figure 69. Total Dissolved Solids in Water from POTW Sites: 2012-2016

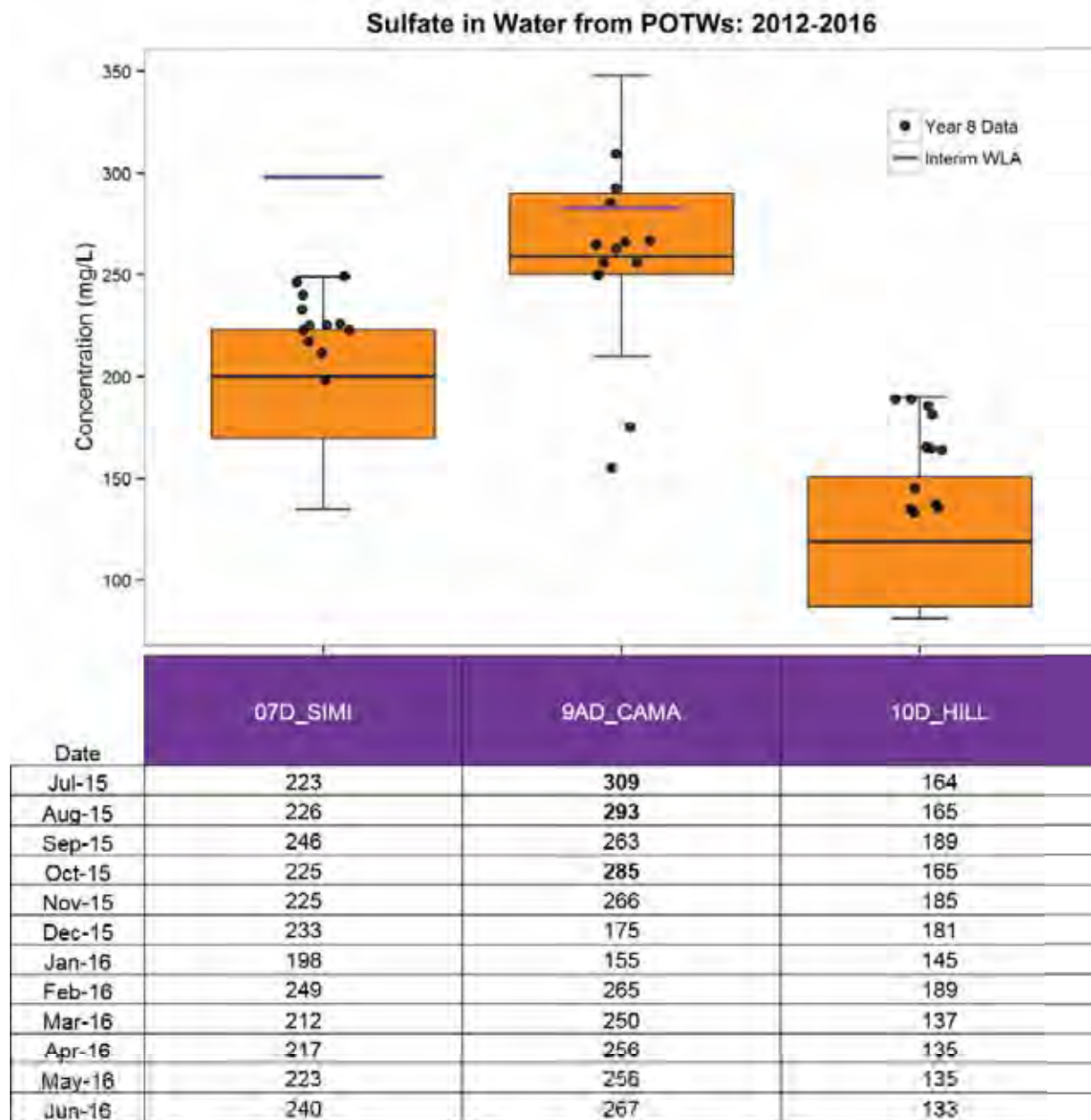


Figure 70. Sulfate in Water from POTW Sites: 2012-2016

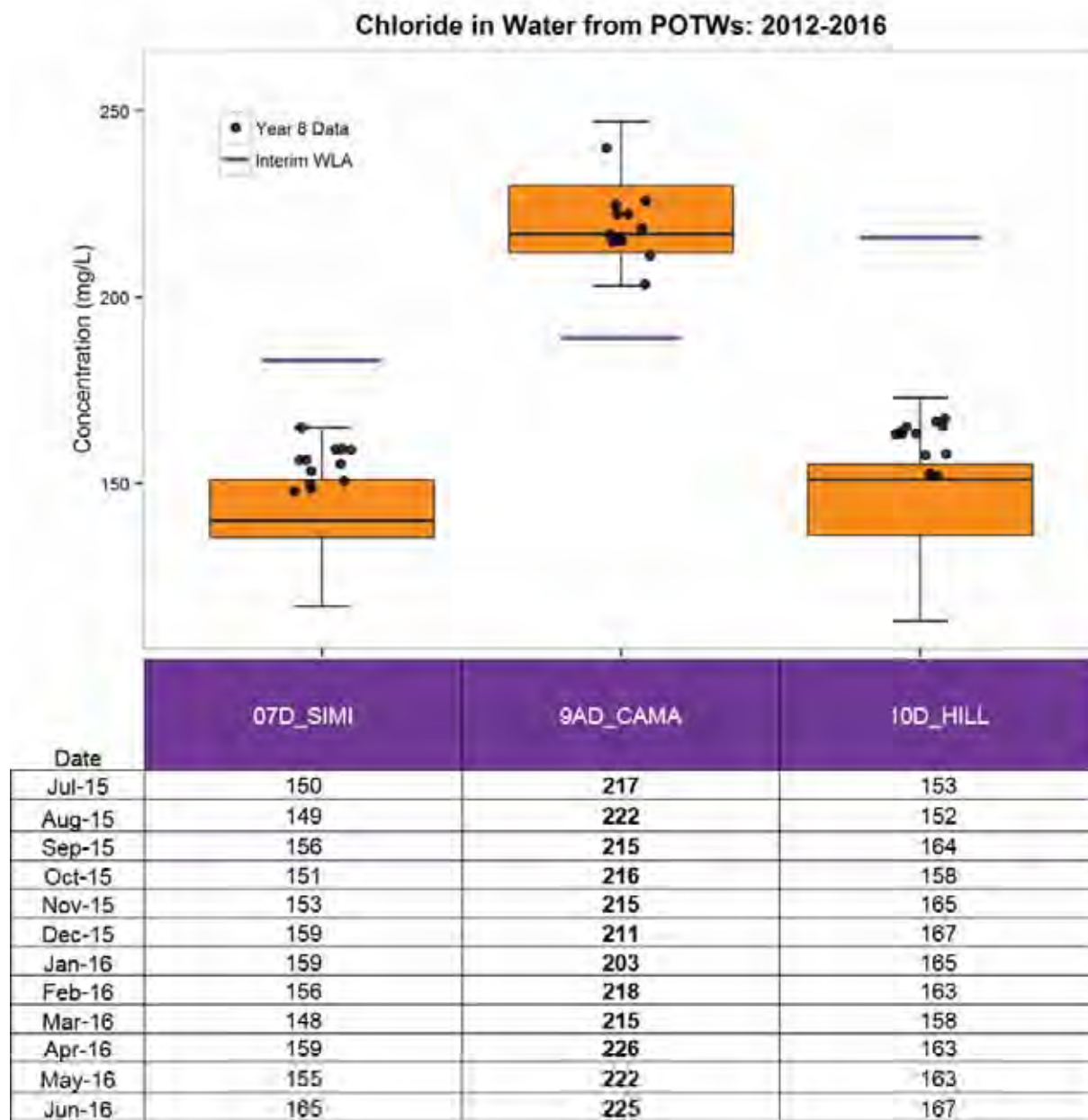


Figure 71. Chloride in Water from POTW Sites: 2012-2016

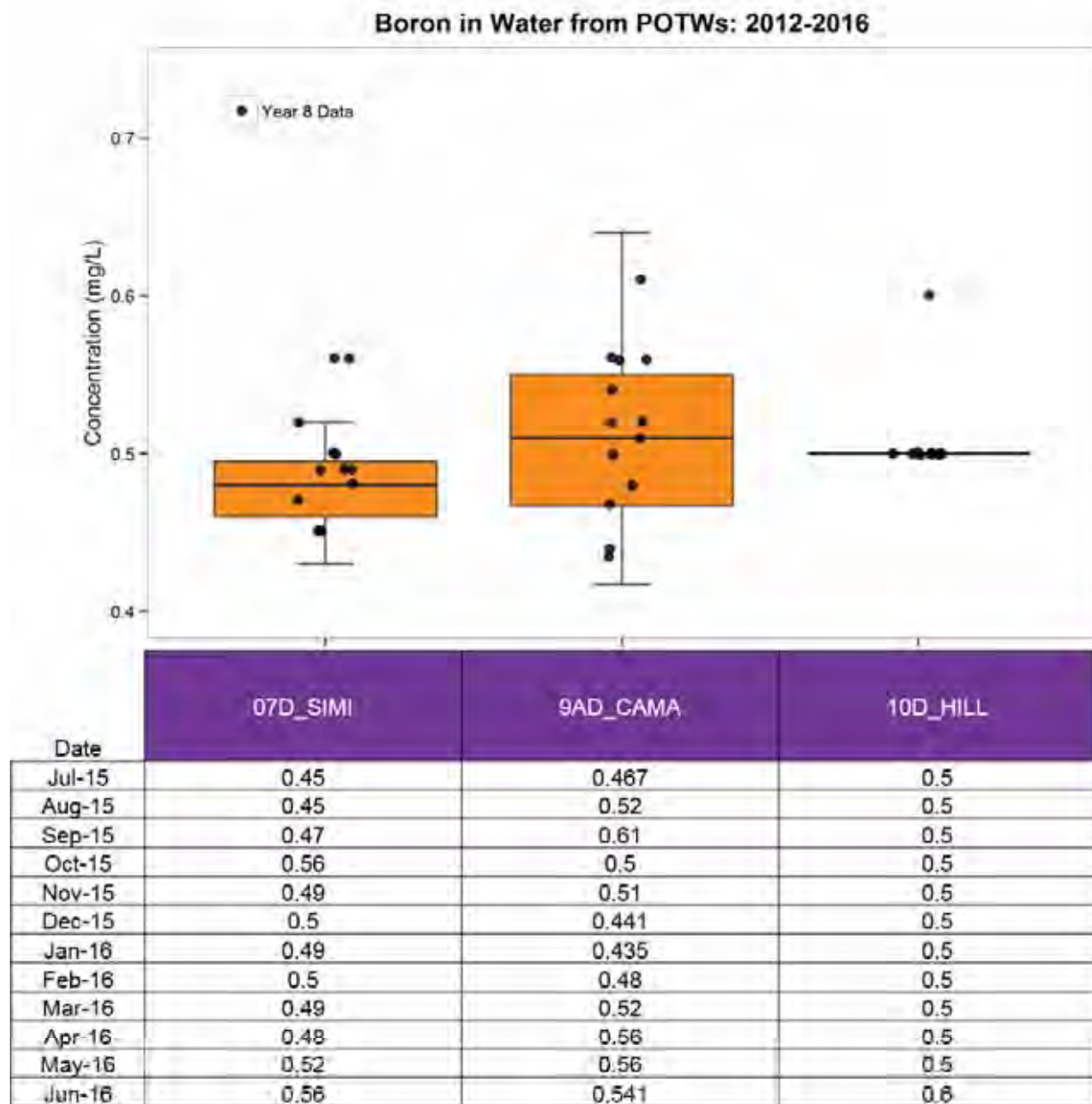


Figure 72. Boron in Water from POTW Sites: 2012-2016

TISSUE DATA

Tissue data is provided in the following tables for freshwater monitoring locations. Tissue samples are only collected in Mugu Lagoon every three years. The last tissue collection in the lagoon took place in year 7 and the associated data can be found in that annual monitoring report. For all tables, only those constituents that have been detected in at least one sample are included.

Freshwater Tissue Data

Table 9. Calleguas Creek – Camarillo Street CSUCI (03_UNIV) Fish Tissue Data Years 1-8 ^{1,2,3}

Date	Fish		Lipids Percent Lipids %	OC Pesticides ²								Toxaphene ng/g	PCBs ² Total PCBs ng/g
				Chlordane -alpha ng/g	Chlordane -gamma ng/g	2,4'- DDD ng/g	2,4'- DDE ng/g	2,4'- DDT ng/g	4,4'- DDD ng/g	4,4'- DDE ng/g	4,4'- DDT ng/g		
8/6/08	Arroyo Chub	Whole Fish	4.7	DNQ	ND	ND	6.6	ND	ND	373	ND	ND	ND
9/3/09		Comp. #1	4.2	25	11	24	38	97	127	2422	13	6397	98
9/3/09		Comp. #2	5.7	20	13	28	38	102	116	2782	20	5675	55
9/3/09		Comp. #3	6	32	15	31	45	117	175	2951	18	4300	56
9/3/09	Black Bullhead	Carcass	2.5	43	22	22	13	ND	184	6980	469	6469	55
9/3/09		Fillet w/ Skin	1.3	29	13	12	ND	ND	90	3603	233	3283	32
9/3/09	Common Carp	Carcass #1	4	32	15	25	17	29	100	2209	240	4805	ND
9/3/09		Carcass #2	4.3	37	19	24	DNQ	16	112	2492	328	8510	21
9/3/09		Carcass #3	4.7	47	25	26	22	31	119	2744	466	ND	ND
9/3/09		Fillet w/ Skin #1	1.5	5.5	ND	DNQ	ND	10	21	413	46	ND	ND
9/3/09		Fillet w/ Skin #2	1.6	12	DNQ	13	ND	21	25	708	115	ND	ND
9/3/09		Fillet w/ Skin #3	1.9	7.5	DNQ	18	ND	33	45	772	140	ND	ND
9/3/10	Arroyo Chub	0-85 mm	4.3	DNQ	DNQ	ND	DNQ	DNQ	DNQ	167	16	ND	ND
9/3/10		86-112 mm	7	DNQ	DNQ	DNQ	12	30	44	1300	20	646	DNQ
9/3/10	Common Carp		4.3	DNQ	DNQ	DNQ	ND	DNQ	21	247	32	403	ND

Date	Fish		Lipids Percent Lipids %	OC Pesticides ²								PCBs ²	
				Chlordane -alpha ng/g	Chlordane -gamma ng/g	2,4'- DDD ng/g	2,4'- DDE ng/g	2,4'- DDT ng/g	4,4'- DDD ng/g	4,4'- DDE ng/g	4,4'- DDT ng/g	Toxaphene ng/g	Total PCBs ng/g
8/25/11	Common Carp		1.9	DNQ	ND	DNQ	ND	8.5	ND	125	ND	DNQ	ND
8/30/12			1.5	ND	ND	ND	ND	ND	ND	175	ND	ND	ND
8/27/13	Whole Fish Composite Fathead Minnow Green Sunfish Common Carp		3	ND	ND	ND	ND	ND	ND	200.5	ND	ND	ND
6/17/15	Common Carp	Whole Fish	5.1	37	9.5	19.2	20.3	103.1	227.5	7093.5	26.5	623.4	505.4
		Filet w/o skin #1	2.4	ND	ND	DNQ	DNQ	6.1	15.6	901.7	ND	128.7	DNQ
		Filet w/o skin #2	1.3	ND	ND	ND	ND	DNQ	DNQ	330.6	ND	93.19	ND
8/11/15	Fathead Minnow	Composite #1	12.6	20.0	7.6	ND	14.3	38.7	108.9	1959.1	ND	ND	35.4
		Composite #2	10.0	13.7	ND	ND	7.3	13.3	55.4	1009.4	ND	ND	23.4
		Composite #3	8.3	11.2	ND	ND	5.9	12.5	39.6	663.4	ND	ND	44.9
		Composite #4	10.9	36.1	9.0	13.0	18.4	21.3	56.0	1306.9	ND	156.8	29.7

1. Only constituents with detected values are included in the table.
2. Units are in wet weight with the exception of 2015 data, which the lab reported in dry weight.
3. No fish were caught at this site during the two days of fish collection in summer 2016.

Table 10. Conejo Creek – Adolfo Road (9B_ADOLF) Fish Tissue Data Years 1 – 8 ^{1, 2}

Date	Fish		Lipids	OC Pesticides ³									PCBs ³
			Percent Lipids	Chlordane -alpha	Chlordane -gamma	2,4'-DDD	2,4'-DDE	2,4'-DDT	4,4'-DDD	4,4'-DDE	4,4'-DDT	Toxaphene	Total PCBs
			%	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
8/6/08	Common Carp		3.5	ND	ND	ND	ND	ND	ND	111	54	ND	ND
9/3/09	Arroyo chub	Comp. #1	8.6	19	8.2	10	22	54	47	694	14	3611	ND
9/3/09		Comp. #2	9.5	18	5.2	15	15	40	37	646	21	3213	56
9/3/09		Comp. #3	8.4	18	6.8	16	21	43	61	629	ND	2766	67
9/3/09	Common Carp	Carcass #1	2.5	21	6.0	15	ND	ND	27	754	ND	ND	54
9/3/09		Fillet w/ Skin #1	0.8	ND	ND	ND	ND	ND	10	190	ND	ND	ND
9/3/09		Carcass #2	4.8	49	24	18	ND	ND	170	3643	99	3566	93
9/3/09		Fillet w/ Skin #2	1.6	10	5.4	8.6	ND	ND	43	1019	30	ND	26
9/3/09		Carcass Comp. #3	4	27	15	19	12	131	58	1019	190	2544	70
9/3/09		Fillet Comp. w/ Skin #3	1.8	DNQ	ND	25	ND	57	37	274	86	ND	ND
9/3/10	Arroyo chub	0-85 mm	4.9	DNQ	ND	DNQ	DNQ	11	21	626	17	487	ND
9/3/10		86-112 mm	6.6	DNQ	DNQ	ND	DNQ	DNQ	DNQ	137	14	ND	ND
8/25/11	Common carp		2.4	DNQ	DNQ	ND	ND	DNQ	ND	49	ND	DNQ	ND
8/27/13	Largemouth Bass		1.3	ND	ND	ND	ND	ND	ND	85.7	ND	ND	ND
6/17/15	Common Carp	Whole Fish	13.4	31.2	13.7	15.9	ND	20.5	35.2	678.1	DNQ	347.68	106.9
		Fillet w/o skin #1	9.8	22.9	10.9	12.4	10.2	7.4	35.2	350.5	10.6	452.86	58.5
		Fillet w/o skin #2	4.8	8	DNQ	DNQ	DNQ	5.2	12.2	635.7	ND	185.91	99.6

Date	Fish	Lipids	OC Pesticides ³									PCBs ³
		Percent Lipids %	Chlordane -alpha ng/g	Chlordane -gamma ng/g	2,4'- DDD ng/g	2,4'- DDE ng/g	2,4'- DDT ng/g	4,4'- DDD ng/g	4,4'- DDE ng/g	4,4'- DDT ng/g	Toxaphene ng/g	Total PCBs ng/g
5/18/16	Common Carp #1	5.68	7.7	DNQ	61.1	7.1	31.0	ND	226.4	DNQ	ND	46.8
	Common Carp #2	3.88	9.8	DNQ	31.2	11.3	7.8	12.8	316.6	ND	DNQ	57.3
	Common Carp #3	0.96	DNQ	ND	8.6	DNQ	DNQ	ND	79.9	ND	ND	31.0

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during year five.
3. Units are wet weight with the exception of 2015 data, which the lab reported in dry weight.

Table 11. Arroyo Simi – Hitch Boulevard (07_HITCH) Fish Tissue Data Years 1 – 8 ^{1,2}

Date	Fish			Lipids	OC Pesticides ³							PCBs ³	
				Percent Lipids	Chlordane -alpha	Chlordane -gamma	2,4'-DDD	2,4'-DDE	2,4'-DDT	4,4'-DDD	4,4'-DDE	4,4'-DDT	Total PCBs
				%	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
8/6/08	Arroyo Chub	Composite		8.3	ND	ND	ND	DNQ	ND	ND	521	ND	ND
9/3/09	Arroyo Chub	Composite #1	43-60mm	9.5	DNQ	ND	20	ND	52	233	955	ND	ND
9/3/09		Composite #1	65-90mm	10.6	ND	ND	5.3	DNQ	12	15.8	365	ND	ND
9/3/09		Composite #2	43-60mm	9.7	DNQ	ND	33	ND	749	437	1183	ND	ND
9/3/09		Composite #2	65-90mm	10.5	DNQ	ND	32	14.6	74	195	1648	26	28
9/3/09		Composite #3	43-60mm	8.3	DNQ	ND	26	ND	45	343	967	ND	ND
9/3/09		Composite #3	65-90mm	11.3	6.6	ND	27	ND	57	110	1275	38	ND
9/3/10	Arroyo Chub			7.8	ND	ND	DNQ	DNQ	19	19.2	673	DNQ	ND
8/28/13	Whole Fish Composite Largemouth Bass Goldfish			11.9	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/17/15	Largemouth Bass	Whole fish #1		14.5	20.3	DNQ	ND	ND	ND	ND	315.1	ND	85.8
		Whole fish #2		11.8	ND	ND	ND	ND	ND	ND	254.4	ND	22.2
		Whole fish #3		14.9	DNQ	ND	ND	ND	5.1	11.8	574.1	20.6	33.7
		Whole fish #4		7.8	DNQ	ND	ND	ND	ND	ND	328.9	ND	53.1
		Whole fish #5		14.7	7.2	ND	ND	ND	5.6	10.1	398.7	15.8	71.9

Date	Fish	Lipids Percent Lipids %	OC Pesticides ³								PCBs ³	
			Chlordane -alpha	Chlordane -gamma	2,4'- DDD	2,4'- DDE	2,4'- DDT	4,4'- DDD	4,4'- DDE	4,4'- DDT	Total PCBs	
			ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	
8/11/15	Goldfish	Composite	5.6	ND	ND	ND	ND	ND	ND	112.8	ND	ND
		Grab #1	4.2	ND	ND	ND	ND	ND	ND	184.1	ND	ND
		Grab #2	7.1	6.7	5.0	5.7	ND	ND	ND	101.3	ND	DNQ
		Grab #3	8.6	DNQ	DNQ	ND	ND	ND	ND	109.2	10.6	ND
	Fathead Minnow	Composite #1	17.2	6.6	DNQ	ND	ND	15.9	ND	360.8	8.1	ND
		Composite #2	14.2	5.5	DNQ	DNQ	ND	17.4	15.2	247.5	ND	ND
		Composite #3	11.0	DNQ	DNQ	ND	ND	15.7	22.8	323.5	ND	ND
		Composite #4	8.4	ND	ND	ND	ND	15.7	ND	191.7	ND	ND
		Composite #5	20.6	6.4	DNQ	ND	ND	30.5	ND	323.8	ND	DNQ
	5/18/16	Fathead Minnow	#1	4.08	ND	ND	8.6	ND	6.1	ND	203	DNQ
#2			4.51	ND	ND	16.4	ND	15.9	ND	365.6	12.9	54.3
#3			4.49	ND	ND	15.5	ND	8.4	ND	548.7	16.9	50.4
#4			4.4	DNQ	ND	26.4	ND	18.1	ND	442.8	15.5	67.5
#5			4.37	ND	ND	19.4	ND	16.4	ND	542.9	DNQ	59.6
6/22/16 ₄	Goldfish	Filet with Skin #1	8.9	DNQ	DNQ	ND	ND	ND	ND	68.5	ND	ND
		Filet with Skin #2	8.5	DNQ	DNQ	ND	ND	ND	ND	44.6	ND	ND
		Filet with Skin #3	4.4	DNQ	DNQ	ND	ND	ND	ND	41.0	ND	ND
		Filet with Skin #4	21.7	DNQ	DNQ	ND	ND	ND	ND	44.4	ND	ND

1. Only constituents with detected values are included in the table.

2. No fish were caught at this site during years 4 or 5.

3. Units are wet weight with the exception of 2015 data, which the lab reported in dry weight.

4. June 22, 2016 samples were collected closer to the 07_TIERRA salts monitoring site and are labeled as such in the data files. However, the data is included here with the 07_HITCH data as the nearest fish tissue monitoring location.

Table 12. Arroyo Las Posas – Somis Road (06_SOMIS) Fish Tissue Data Years 1 – 8 ^{1, 2, 3}

Date	Fish		Lipids Percent Lipids %	OC Pesticides ³							Toxaphene ng/g	PCBs ⁴ Total PCBs ng/g
				Chlordane -alpha ng/g	Chlordane -gamma ng/g	2,4'- DDD ng/g	2,4'- DDE ng/g	2,4'- DDT ng/g	4,4'- DDD ng/g	4,4'- DDE ng/g		
8/6/08	Arroyo Chub	Composite	2.7	ND	ND	ND	ND	ND	ND	492	ND	ND
9/3/09	Arroyo Chub	Composite #1 29-51mm	6.7	11	DNQ	37	ND	ND	646	1918	ND	34
9/3/09		Composite #1 53-97mm	4.6	DNQ	ND	62	ND	ND	535	1967	2821	36
9/3/09		Composite #2 29-51mm	6.8	9.0	DNQ	55	ND	ND	1158	2203	ND	31
9/3/09		Composite #2 53-97mm	6.2	12	5.9	28	16	43	128	2313	3054	44
9/3/09		Composite #3 29-51mm	5.7	10	DNQ	30	11	122	157	2124	ND	56
9/3/09		Composite #3 53-97mm	5.3	10	DNQ	12	ND	36	258	2258	2103	32

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during years 3, 4, 5, 6, or 7.
3. Access to 06_SOMIS was revoked during year eight.
4. Units are wet weight with the exception of 2015 data, which the lab reported in dry weight.

Table 13. Revolon Slough – Wood Road (04_WOOD) Fish Tissue Data Years 1 – 8 ^{1,2}

Date	Fish	Lipids Percent Lipids %	OC Pesticides ³									Toxaphene ng/g	PCBs ³ Total PCBs ng/g
			Chlordane -alpha ng/g	Chlordane -gamma ng/g	2,4'- DDD ng/g	2,4'- DDE ng/g	2,4'- DDT ng/g	4,4'- DDD ng/g	4,4'- DDE ng/g	4,4'- DDT ng/g			
8/7/08	Common Carp	Comp. Fillet, no skin	3	ND	ND	27	ND	14	85	1194	21	349	ND
8/7/08		Comp. Fillet w/ skin	2.1	5.3	ND	18	7.4	DNQ	40	615	13	259	ND
9/3/09	Common Carp	Carcass	12.1	91	62	129	25	ND	1210	11100	904	25800	28
9/3/09		Fillet w/ Skin #1	2.8	35	21	55	17	ND	262	4210	328	6630	ND
9/3/09		Carcass	9.6	102	60	205	76	ND	1070	9590	367	17000	51
9/3/09		Fillet w/ Skin #2	3.3	47	31	110	31	ND	371	4790	168	5930	DNQ
9/3/09		Carcass	9	117	66	185	64	ND	1100	7750	411	14300	54
9/3/09		Fillet w/ Skin #3	2.7	54	33	77	39	50	378	4000	239	5480	20
9/3/09	Arroyo Chub	Comp. #1	8.7	41	27	133	77	191	878	6320	57	14700	24
9/3/09		Comp. #1	9	38	24	82	73	222	689	5630	36	19900	DNQ
9/3/09		Comp. #2	6.9	33	16	88	65	168	568	5580	52	17900	ND
8/25/11	Common carp		2.6	9.3	5.5	15	DNQ	67	ND	819	8.5	206	ND
8/30/12	Common carp		5.6	ND	ND	ND	ND	116	ND	1750	ND	ND	ND
8/27/13	Whole Fish Composite Common carp Fathead Minnow		6.3	ND	ND	ND	ND	ND	84.3	1984.1	ND	1611.1	ND

Date	Fish	Lipids Percent Lipids %	OC Pesticides ³									Toxaphene ng/g	PCBs ³
			Chlordane -alpha ng/g	Chlordane -gamma ng/g	2,4'- DDD ng/g	2,4'- DDE ng/g	2,4'- DDT ng/g	4,4'- DDD ng/g	4,4'- DDE ng/g	4,4'- DDT ng/g	Total PCBs ng/g		
6/17/15	Common Carp	Whole Fish #1	13.6	50.1	24.2	76.2	35.1	61.4	277.1	4474.4	294.5	3534.4	57.4
		Whole Fish #2	15.6	136.5	66.7	139.3	40.9	91.4	608	10502.1	560.4	4699.7	119.1
		Whole Fish #3	16.9	89.9	42.4	57.7	ND	67.4	534.5	8634.2	316.4	4147.6	72.7
		Fillet w/o skin #1	11.5	60.6	31	74.6	26.3	41.4	171.8	3492.5	217.5	3116.8	20.4
		Filet w/o skin #2	3.2	DNQ	DNQ	7.5	ND	13.7	37.3	632.7	41	728.3	ND
		Filet w/o skin #3	3.1	DNQ	DNQ	DNQ	ND	12.7	28.3	669.7	36.9	472.1	ND
		Filet w/o skin #4	2.6	DNQ	DNQ	9.4	6.6	14	29.4	724.4	18.5	472.9	ND
	Bullhead	Whole Fish	12.4	56	26.8	45.1	ND	80.5	270	3880.8	360.8	4567.3	42.9
		Filet w/o skin #1	2.8	ND	ND	ND	ND	18.3	39.8	810.7	40.8	736.6	ND
		Filet w/o skin #2	6.2	ND	ND	ND	ND	22.5	40.5	749.4	30.5	635.9	ND
8/11/15	Fathead Minnow	Comp. #1	23.3	50.0	22.3	71.1	42.2	114.4	238.6	3816.7	22.9	1546.3	56.6
		Comp. #2	18.8	52.5	22.0	57.3	43.7	71.6	305.2	4110.5	40.5	1157.2	55.4
		Comp. #3	14.8	48.4	22.1	34.2	46.3	50.2	375.7	3921.3	19.8	852.5	58.8
		Comp. #4	28.5	85.9	47.6	109.8	78.3	113.1	466.5	5563.2	61.1	1094.6	48.7

Date	Fish	Lipids Percent Lipids %	OC Pesticides ³									PCBs ³ Total PCBs ng/g	
			Chlordane -alpha ng/g	Chlordane -gamma ng/g	2,4'- DDD ng/g	2,4'- DDE ng/g	2,4'- DDT ng/g	4,4'- DDD ng/g	4,4'- DDE ng/g	4,4'- DDT ng/g	Toxaphene ng/g		
5/18/16	Common Carp	#1	3.86	41	13.1	29.4	22.6	ND	346.1	4589.7	108.7	738.3	202.6
		#2	8.86	77	30.5	16.4	43.2	ND	617.5	7027.5	414.9	1871.6	120.7
		#3	1.11	19.3	9.1	DNQ	6.2	ND	174.1	1721.2	55.5	450.6	48.4
		#4	10.98	38.7	18.9	DNQ	ND	ND	157.4	2229.8	151.7	1602.9	31.2
		#5	3.93	33.3	11.3	17.3	21.2	ND	320.1	7042.7	91.4	537.1	111.6
		#6	6.36	57.2	17.1	24.2	11.3	ND	553.4	6460	110.1	1193.4	264.1
		#7	2.22	26.3	13.6	11.5	22.8	ND	275	3541.7	73	621.5	132.6
		#8	2.71	19.1	7.1	DNQ	DNQ	ND	198.7	3388.9	28.8	511.6	130.5
	Fathead Minnow	#1	3.89	25.5	9.9	12.6	37.6	ND	229.3	3058.8	ND	342.6	40.6
		#2	1.69	DNQ	DNQ	ND	7.8	ND	100	1508.3	ND	130.5	87.1
		#3	2.43	5.5	DNQ	ND	8.1	ND	66.7	1129.6	ND	ND	43.2
		#4	5.94	29.5	12	23.6	12.3	ND	132.6	1963.2	ND	775.3	88.1
		#5	2.02	11.9	8.7	33.7	13	15	105.5	1010.5	18.3	ND	62.9
		#6	1.41	7.1	DNQ	12	10.2	ND	46.9	516.3	ND	118.3	32
		#7	1.52	9.7	DNQ	10	10	ND	36.3	658.1	8	274.7	36.4
	Goldfish ⁴	Filet w/ Skin #1	NA ⁴	DNQ	DNQ	ND	ND	ND	18.4	258.4	11.3	ND	61.7
		Filet w/ Skin #2	NA ⁴	DNQ	DNQ	DNQ	ND	ND	18.1	227.6	8.9	56	37.4
		Filet w/ Skin #3	NA ⁴	DNQ	DNQ	ND	DNQ	ND	16.2	269.7	6.8	DNQ	33.0
		Filet w/ Skin #4	NA ⁴	DNQ	DNQ	ND	DNQ	ND	14.7	242.2	5.4	DNQ	46.5

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during year 3.
3. Units are wet weight with the exception of 2015 data, which the lab reported in dry weight.
4. Percent lipid data not available due to small fish size.

Table 14. Revolon Slough – Wood Road (04_WOOD) Metals Fish Tissue Data Years 1 – 8 ^{1, 2}

Date	Fish	Lipids Percent Lipids %	Metals ³		
			Total Mercury µg/g	Total Selenium µg/g	
8/7/08	Common Carp	Comp. Fillet, no skin	3	DNQ	1.3
8/7/08		Comp. Fillet w/ skin	2.1	DNQ	2.3
9/3/09	Common Carp	Carcass #1	12.1	DNQ	1.5
9/3/09		Fillet w/ Skin #1	2.8	DNQ	1.6
9/3/09		Carcass #2	9.6	DNQ	1.9
9/3/09		Fillet w/ Skin #2	3.3	DNQ	2.1
9/3/09		Carcass #3	9	DNQ	1.4
9/3/09		Fillet w/ Skin #3	2.7	0.02	1.7
9/3/09	Arroyo Chub	Comp. #1	8.7	0.02	1.6
9/3/09		Comp. #1	9	0.02	1.8
9/3/09		Comp. #2	6.9	0.02	1.4
8/25/11	Common carp		2.6	0.004	2.7
9/4/12	Common carp		5.6	0.011	1.9
8/27/13	Whole Fish Composite Common carp Fathead Minnow		6.3	0.01	1.9
6/17/15	Common Carp	Whole Fish #1	13.6	0.1	6.5
		Whole Fish #2	15.6	0.1	5.3
		Whole Fish #3	16.9	0.1	4.8
		Fillet w/o skin #1	11.5	0.1	4.8
		Fillet w/o skin #2	3.2	0.1	5.3
		Fillet w/o skin #3	3.1	0.1	5.9
		Fillet w/o skin #4	2.6	0.1	5.5
	Bullhead	Whole Fish	12.4	0.1	7.9
		Fillet w/o skin #1	2.8	0.1	5.9
Fillet w/o skin #2		6.2	0.2	5.1	

Date	Fish	Lipids Percent Lipids %	Metals ³	
			Total Mercury µg/g	Total Selenium µg/g
8/11/15	Fathead Minnow	Comp. #1	23.3	0.1
		Comp. #2	18.8	0.1
		Comp. #3	14.8	0.7
		Comp. #4	28.5	0.7
5/18/16 ⁴	Common Carp	#1	3.86	0.03
		#2	8.86	0.04
		#3	1.11	0.02
		#4	10.98	0.02
		#5	3.93	0.03
		#6	6.36	0.03
		#7	2.22	0.02
		#8	2.71	0.02
	Fathead Minnow	#1	3.89	0.02
		#2	1.69	0.03
		#3	2.43	0.03
		#4	5.94	0.03
		#5	2.02	0.01
		#6	1.41	0.03
		#7	1.52	0.03

1. Only constituents with detected values are included in the table.
2. No fish were caught at this site during year 3.
3. Units are wet weight with the exception of 2015 data, which the lab reported in dry weight.
4. Goldfish tissue amounts collected on this date were insufficient to provide OC pesticides, PCBs, and metals analyses. It was determined that OC pesticides and PCBs results were most valuable to the monitoring program to support the long-term data evaluation related to natural attenuation of these constituents.

TOXICITY DATA

The following is a summary of the toxicity results to date for water column and sediment at the freshwater and estuarine sampling sites. Table 17 displays significant water column mortality test results for eight years of CCWTMP events, including both dry and storm (bolded text) events. Significant mortality found in freshwater sediments is shown in Table 16.

Toxicity was frequently identified at the 04_WOOD site during the first two monitoring years in water column samples and in each of the four sediment samples. The Stakeholders have chosen to invest resources into source control efforts to address sources potentially contributing to the toxicity issue. This is being accomplished through the implementation of the Agricultural Water Quality Management Plan (AWQMP) developed by the Ventura County Agricultural Irrigated Lands Group (VCAILG) as part of the Conditional Waiver for Irrigated Agricultural Lands (Ag Waiver).

During dry weather water column sampling, toxicity has been identified historically at all sampled sites except 13_BELT. There were no occurrences of dry weather water column toxicity during the eighth year of monitoring. Toxicity has been identified during wet weather monitoring at all sites, except for 10_GATE and 13_BELT. Wet weather toxicity occurred during both storm events for this year of monitoring (Event 52 and Event 53).

Water column TIEs have been initiated as described previously, and outcomes of these efforts have had limited success in identifying the true cause of toxicity. While not identifying the specific constituents causing toxicity, the TIEs have identified:

- Organic compounds are likely contributors to ambient water toxicity.
- Compounds similar to organophosphorus (OP) pesticides are continually being identified as possible contributors to the observed toxicity.

The results of future CCWTMP toxicity testing will continue to assist in the identification of when and where conditions are toxic in the Calleguas Creek watershed, and help the stakeholders better target areas in the watershed that show continual toxicity and focus limited resources to address the problems.

All of the freshwater toxicity occurrences during year eight were at the 04_WOOD site.

In year eight, fresh water sediment toxicity testing was performed during Event 50 for 04_WOOD, 02_PCH, 03_UNIV, and 9A_HOWAR. Statistically significant acute toxicity was observed for *Hyalella azteca* at 04_WOOD, but no toxicity was observed for the remaining sites. Follow-up toxicity investigation was not conducted at the 04_WOOD sites as TIEs are not performed at 04_WOOD due to the reason stated above.

Table 15. Water Column Toxicity for All Monitoring Events and Sites

(Significant mortality denoted by "X", bolded events are wet weather events)

CCWMTP Year	Event	Site ID						
		04_WOOD	9B_ADOLF	03_UNIV	10_GATE	06_SOMIS	13_BELT	07_HITCH
Year 1	1	X						
	2	X						
	3	X	X	X				X
	4	X						
	5	X						X
	6							
Year 2	9							
	12	X						
	14	X		X		X		
	16	X		X				X
	17							
	20			X				
Year 3	22							
	23							
	24	X						
	25							
	26	X						X
	27							
Year 4	28					X		
	29		X		X			
	30	X						
	31							
	32			X				
	33							
Year 5 ¹	34							
	35							
	36	X ²						
	37			X ³				
	38							
Year 6	39	X ²						
	40				4			
	41		6	6	6	6	5	6
	42							
	43							
Year 7	44	X ²		7		8		
	45	X ²					9	
	46	X ²		X ¹⁰		X ¹¹		X ¹⁰
	47	X ²						
	48							
	49	X ²				12	12	

CCWMTP Year	Event	Site ID						
		04_WOOD	9B_ADOLF	03_UNIV	10_GATE	06_SOMIS	13_BELT	07_HITCH
Year 8 ¹³	50							
	51							
	52	X ²						
	53	X ²						
	54							
	55							

1. 10_GATE and 13_BELT are also toxicity investigation monitoring sites. During year 5 these sites were only sampled during Event 38.
2. A TIE was not initiated at this site. TIEs conducted during previous monitoring years identified organic compounds such as pesticides as the likely cause of the toxicity. TIEs have been suspended while efforts are taken to reduce the source of the toxicity.
3. A Phase I TIE was conducted for this site. While the TIE did not conclusively identify a source of toxicity, the results were indicative of organic compounds. The corresponding water quality sample detected the OP pesticide chlorpyrifos at a concentration of 0.083 µg/L. This level is above the wasteload allocation for stormwater discharges but below the agricultural discharger's interim load allocation and above the final numeric target.
4. Toxicity testing was not performed at the 10_GATE site for Event 40.
5. Toxicity testing was not performed at the 10_BELT site for Event 41.
6. Successful toxicity testing for sites with conductivity less than 3000 µS/cm could not be completed for Event 41 due to a decline in the *C. dubia* laboratory culture. Sites include: 9B_ADOLF, 03_UNIV, 10_GATE, 06_SOMIS, and 07_HITCH.
7. An initial and a follow-up Phase I TIE was conducted for this site. Though the acute and chronic results of the toxicity test was not significantly different than that of the laboratory, the testing of this site did result in a greater than 50% mortality, triggering the initial and follow-up Phase I TIE. The initial TIE did not conclusively determine the source of toxicity, but did suggest that multiple co-occurring contaminants may have been responsible for the toxicity. The follow-up TIE demonstrated that no additional reductions in survival or reproduction occurred after the initial Baseline treatment, suggesting that the toxicity observed in the initial test was not persistent. This result suggests that the toxicant may have undergone natural degradation processes as the sample water aged.
8. Toxicity testing was not performed at the 06_SOMIS site for Event 44.
9. Toxicity testing was not performed at the 13_BELT site for Event 45.
10. A Phase I TIE was initiated at this site. While the TIE did not conclusively identify a source of toxicity, the results suggest that compounds that are activated by the Cytochrome-P450 system (e.g. OP pesticides) are contributing to sample toxicity.
11. A Phase I TIE was initiated at this site. While the TIE did not conclusively identify a source of toxicity, the results suggest that non-polar organic compound(s) are contributing to the ambient toxicity.
12. Toxicity testing was not performed at the 06_SOMIS or 13_BELT sites for Event 49.
13. During year 8, toxicity testing was only performed at the 06_SOMIS site for Event 52.

Table 16. Sediment Toxicity for All CCWMTP Freshwater Monitoring Events and Sites
(Significant mortality denoted by "X")

CCWMTP Year	Event	Site ID			
		04_WOOD	02_PCH ¹	03_UNIV	9A_HOWAR ¹
Year 1	1	X			
Year 2	9	X			
Year 3	22	X			
Year 4	28	X	X	X	
Year 5	34	X		X	
Year 6	39	X		X ²	
Year 7	44	X		X	
Year 8	50	X			

1. 02_PCH and 9A_HOWAR are toxicity investigation monitoring sites.
2. A TIE targeted for organics was performed for the 03_UNIV site due to a greater than 50 percent reduction in *H. azteca* survival.

Exceedance Evaluation and Discussion

As outlined in the QAPP, data applicable to targets or allocations were reviewed for this report. The collected data were compared to the applicable targets or allocations and it is this comparison that the various agencies will use to determine necessary actions in accordance with their permit or conditional waiver. The comparison does not provide a determination of compliance with any TMDL provision of an individual permit or conditional waiver, as some permit/waiver conditions may vary from the comparisons provided in this section. For the comparison, various procedures were used depending on whether or not the final compliance dates for the TMDL were applicable during the monitoring year.

For TMDLs where final allocations or targets are not currently effective (OC Pesticides, Metals, and Salts TMDLs), the following compliance comparisons were conducted:

1. Applicable receiving water data at the compliance locations (base of each subwatershed) were compared to the interim load allocations and waste load allocations.
2. If an exceedance of an interim load allocation and/or waste load allocation was observed, the contributing land use data were reviewed to evaluate the potential cause of the exceedance.
3. POTW effluent data were compared to the relevant interim waste load allocations.

For the Nitrogen TMDL the following comparisons were conducted:

1. For POTWs, the final waste load allocations are currently effective. As a result, effluent monitoring results were compared to the final allocations for the analysis.
2. For agricultural dischargers and other non-point sources, final load allocations are currently effective. Since agricultural dischargers are the only entities with allocations other than POTWs, compliance is evaluated by comparing receiving water results against TMDL numeric targets.

For the Toxicity TMDL, the following comparisons were conducted:

1. For POTWs, the final waste load allocations are currently effective. As a result, effluent monitoring results were compared to the final allocations for the comparison.
2. For MS4 dischargers, the final waste load allocations are currently effective. As a result, applicable receiving water data at the compliance locations (base of each subwatershed) were compared to the final waste load allocations. If an exceedance of the final waste load allocation was found, the contributing urban land use data were reviewed to evaluate whether the MS4 was potentially causing the exceedance.
3. For agricultural dischargers, the final load allocations became effective in March 2016. As a result, applicable receiving water data at the compliance locations (base of each subwatershed) were compared to the interim load allocations for the first five events and to the final load allocations for the final event of the year (May 2016). If an exceedance of the applicable load allocation for a particular event was observed, the contributing agricultural land use data were reviewed to evaluate whether agricultural discharges were potentially causing the exceedance.

4. In cases where the applicable interim load allocations or final waste load allocations have different values for acute (1-hour) toxicity and chronic (4-day) toxicity, the acute toxicity allocations were used for comparing wet weather data and the chronic toxicity allocations were used for comparing dry-weather data.

The following tables compare the applicable allocations based on the procedure outlined above for each of the TMDLs. Some constituents sampled under the CCWTMP do not have applicable allocations and/or targets and are not included in the comparison.

RECEIVING WATER SITE COMPARISON

Table 17. OC Pesticides, PCBs, & Siltation in Sediment

Site & Constituent	Units	Interim WLA & LA ¹	Event 50 Aug-2015
<i>Calleguas Creek – Hwy 1 Bridge (02_PCH)</i>			
Total Chlordane ²	ng/g dw	17	ND
4,4'-DDD	ng/g dw	66	ND
4,4'-DDE	ng/g dw	470	5.8
4,4'-DDT	ng/g dw	110	ND
Dieldrin	ng/g dw	3	ND
PCBs ³	ng/g dw	3800	ND
Toxaphene	ng/g dw	260	ND
<i>Revolon Slough – Wood Road (04_WOOD)</i>			
Total Chlordane ²	ng/g dw	48	DNQ
4,4'-DDD	ng/g dw	400	DNQ
4,4'-DDE	ng/g dw	1600	23.5
4,4'-DDT	ng/g dw	690	ND
Dieldrin	ng/g dw	5.7	ND
PCBs ³	ng/g dw	7600	ND
Toxaphene	ng/g dw	790	DNQ
<i>Calleguas Creek – Camarillo Street CSUCI (03_UNIV)</i>			
Total Chlordane ²	ng/g dw	17	ND
4,4'-DDD	ng/g dw	66	ND
4,4'-DDE	ng/g dw	470	DNQ
4,4'-DDT	ng/g dw	110	ND
Dieldrin	ng/g dw	3	ND
PCBs ³	ng/g dw	3800	ND
Toxaphene	ng/g dw	260	ND

Site & Constituent	Units	Interim WLA & LA ¹	Event 50 Aug-2015
<i>Conejo Creek – Adolfo Road (9B_ADOLF)</i>			
Total Chlordane ²	ng/g dw	3.4	ND
4,4'-DDD	ng/g dw	5.3	ND
4,4'-DDE	ng/g dw	20	DNQ
4,4'-DDT	ng/g dw	2	ND
Dieldrin	ng/g dw	3	ND
PCBs ³	ng/g dw	3800	ND
Toxaphene	ng/g dw	260	ND
<i>Arroyo Las Posas – Somis Road (06_SOMIS)</i>			
Total Chlordane ²	ng/g dw	3.3	ND
4,4'-DDD	ng/g dw	290	DNQ
4,4'-DDE	ng/g dw	950	DNQ
4,4'-DDT	ng/g dw	670	ND
Dieldrin	ng/g dw	1.1	ND
PCBs ³	ng/g dw	25,700	ND
Toxaphene	ng/g dw	230	ND
<i>Arroyo Simi – Hitch Boulevard (07_HITCH)</i>			
Total Chlordane ²	ng/g dw	3.3	ND
4,4'-DDD	ng/g dw	14	ND
4,4'-DDE	ng/g dw	170	ND
4,4'-DDT	ng/g dw	25	ND
Dieldrin	ng/g dw	1.1	ND
PCBs ³	ng/g dw	25,700	ND
Toxaphene	ng/g dw	230	ND

ND=not detected; DNQ=detected not quantifiable

1. Interim waste load allocation for stormwater permittees and interim load allocations for agricultural dischargers; effective until March 24, 2026 (R4-2005-010).

2. Total chlordane is the sum of alpha and gamma-chlordane.

3. PCBs concentrations are the sum of the seven aroclors identified in CTR (1016, 1221, 1232, 1242, 1248, 1254, and 1260).

Results in green type are below the applicable allocations.

Table 18. Nitrogen Compounds in Water

Site & Constituent	Units	Target ¹	Event 50 Dry Aug-15	Event 51 Dry Nov-15	Event 52 Wet Jan-15	Event 53 Wet Jan-15	Event 54 Dry Feb-15	Event 55 Dry May-15
<i>Mugu Lagoon - Ronald Reagan Bridge (01_RR_BR)</i>								
Ammonia-N	mg/L	8.1	0.22	0.31	0.84	0.25	DNQ	0.23
Nitrate-N	mg/L	10	13.1	18.89	18.61	10.35	31.28	23.85
Nitrite-N	mg/L	1	0.17	0.06	ND	0.06	0.15	0.18
Nitrate-N + Nitrite-N	mg/L	10	13.27	18.95	18.61	10.41	31.43	24.03
<i>Calleguas Creek – Hwy 1 Bridge (02_PCH)</i>								
Ammonia-N	mg/L	5.5	0.19	0.15	0.05	3.19	DNQ	0.06
Nitrate-N	mg/L	10	11.65	26.15	11.54	15.06	17.81	41.22
Nitrite-N	mg/L	1	ND	ND	ND	ND	0.11	ND
Nitrate-N + Nitrite-N	mg/L	10	11.65	26.15	11.54	15.06	17.92	41.22
<i>Calleguas Creek – Camarillo Street CSUCI (03_UNIV)</i>								
Ammonia-N	mg/L	8.4	0.11	0.2	0.33	0.51	0.11	0.05
Nitrate-N	mg/L	10	6.82	6.6	4.3	7.4	7.45	10.2
Nitrite-N	mg/L	1	0.08	0.09	0.06	0.16	0.19	0.19
Nitrate-N + Nitrite-N	mg/L	10	6.90	6.69	4.36	7.56	7.64	10.39
<i>Revolon Slough – Wood Road (04_WOOD)</i>								
Ammonia-N	mg/L	5.7	0.35	0.12	0.37	0.4	0.29	0.29
Nitrate-N	mg/L	10	28.3	36.08	6.68	6.74	46.6	38.82
Nitrite-N	mg/L	1	0.46	0.17	0.07	0.12	0.34	0.74
Nitrate-N + Nitrite-N	mg/L	10	28.76	36.25	6.75	6.86	46.94	39.56
<i>Beardsley Wash – Central Avenue (05_CENTR)</i>								
Ammonia-N	mg/L	5.7	0.06	ND	0.45	0.55	0.05	0.15
Nitrate-N	mg/L	10	20.84	25.48	15.25	10.34	47.1	26.7
Nitrite-N	mg/L	1	0.13	0.12	0.08	0.13	0.44	0.43
Nitrate-N + Nitrite-N	mg/L	10	20.97	25.60	15.33	10.47	47.54	27.13
<i>Arroyo Las Posas – Somis Road (06_SOMIS)³</i>								
Ammonia-N	mg/L	8.1	--	DNQ	NS	NS	NS	NS
Nitrate-N	mg/L	10	--	8.82	NS	NS	NS	NS
Nitrite-N	mg/L	1	--	ND	NS	NS	NS	NS
Nitrate-N + Nitrite-N	mg/L	10	--	8.82	NS	NS	NS	NS

Site & Constituent	Units	Target ¹	Event 50 Dry Aug-15	Event 51 Dry Nov-15	Event 52 Wet Jan-15	Event 53 Wet Jan-15	Event 54 Dry Feb-15	Event 55 Dry May-15
Arroyo Simi – Hitch Boulevard (07_HITCH)								
Ammonia-N	mg/L	4.7	DNQ	DNQ	0.3	0.28	ND	0.21
Nitrate-N	mg/L	10	9.72	7.4	2.96	4.46	10.96	9.95
Nitrite-N	mg/L	1	0.05	0.06	0.07	0.11	0.11	0.13
Nitrate-N + Nitrite-N	mg/L	10	9.77	7.46	3.03	4.57	11.07	10.08
Conejo Creek – Adolfo Road (9B_ADOLF)								
Ammonia-N	mg/L	9.5	0.05	0.02	0.24	0.24	DNQ	0.2
Nitrate-N	mg/L	10	5.3	6.53	4.22	1.02	7.18	6.6
Nitrite-N	mg/L	1	0.05	ND	0.06	0.08	0.12	0.13
Nitrate-N + Nitrite-N	mg/L	10	5.35	6.53	4.28	1.10	7.30	6.73

NS=no sample, dry; NR=not required; ND=not detected; DNQ=detected not quantifiable; J=estimated DNQ values for Nitrite-N, shown for the purpose of calculating the Nitrite-N + Nitrate-N sum and comparing it against the Nitrate-N + Nitrite-N target.

1. Load allocations for Nitrate-N + Nitrite-N are in effect for agricultural and other non-point sources. For the comparison, monitoring results at receiving water compliance sites were compared against TMDL numeric targets (R4-2008-009).
2. One-hour average.
3. Access to 06_SOMIS no longer available.

Results in **bold red type** exceed numeric TMDL target.

Results in **green type** are below the applicable allocations.

Table 19. Toxicity, Diazinon, and Chlorpyrifos in Water

Site & Constituent	Units	Dry WLA ¹	Dry Interim LA ²	Event 50 Dry Aug-15	Event 51 Dry Nov-15	Event 54 Dry Feb-16	Event 55 ³ Dry May-16	Wet WLA ¹	Wet Interim LA ²	Event 52 Wet Jan-16	Event 53 Wet Jan-16
Mugu Lagoon – Ronald Reagan Bridge (01_RR_BR)											
Chlorpyrifos	ug/L	0.014	0.81	0.004	ND	0.009	ND	0.014	2.57	0.106	0.005
Diazinon	ug/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	ND	ND
Calleguas Creek – Camarillo Street CSUCI (03_UNIV)											
Chlorpyrifos	ug/L	0.014	0.81	ND	ND	0.02	ND	0.014	2.57	0.02	0.02
Diazinon	ug/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	0.27	0.005
Revolon Slough – Wood Road (04_WOOD)											
Chlorpyrifos	ug/L	0.014	0.81	ND	ND	0.01	DNQ	0.014	2.57	0.45	0.13
Diazinon	ug/L	0.1	0.138	ND	ND	0.063	ND	0.1	0.278	0.032	0.0287
Arroyo Las Posas – Somis Road (06_SOMIS)											
Chlorpyrifos	ug/L	0.014	0.81	--	0.027	NS	NS	0.014	2.57	NS	NS
Diazinon	ug/L	0.1	0.138	--	ND	NS	NS	0.1	0.278	NS	NS
Arroyo Simi – Hitch Boulevard (07_HITCH)											
Chlorpyrifos	ug/L	0.014	0.81	0.003	ND	ND	ND	0.014	2.57	ND	0.004
Diazinon	ug/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	ND	ND
Conejo Creek – Adolfo Road (9B_ADOLF)											
Chlorpyrifos	ug/L	0.014	0.81	ND	ND	0.002	ND	0.014	2.57	0.017	0.005
Diazinon	ug/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	0.0384	0.002
Conejo Creek – Hill Canyon Below N Fork (10_GATE)											
Chlorpyrifos	ug/L	0.014	0.81	ND	ND	ND	ND	0.014	2.57	ND	ND
Diazinon	ug/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	ND	ND
Conejo Creek – S Fork Behind Belt Press Build (13_BELT)											
Chlorpyrifos	ug/L	0.014	0.81	ND	ND	ND	ND	0.014	2.57	0.0093	ND
Diazinon	ug/L	0.1	0.138	ND	ND	ND	ND	0.1	0.278	ND	ND

ND=not detected; NS=no sample collected due to site being dry.

1. Final Dry and Wet Weather wasteload allocations for Stormwater Dischargers effective as of March 24, 2008 (R4-2005-009).

2. Interim Dry and Wet Weather load allocations for Irrigated Agriculture; effective until March 24, 2016 (R4-2005-009).

3. Final load allocations for irrigated agriculture became effective prior to Event 55. Samples collected during that event were meeting the final load allocations.

Results in **bold purple type** exceed the final wasteload allocation, but not the interim load allocation.

Results in **green type** are below the applicable allocations.

Table 20. Metals and Selenium in Water

Constituent	Units	Dry Interim WLA ¹	Dry Interim LA ²	Event 50 Dry Aug-2015	Event 51 Dry Nov-2015	Event 54 Dry Feb-2016	Event 55 Dry May-2016	Wet Interim WLA ¹	Wet Interim LA ²	Event 52 Wet Jan-2016	Event 53 Wet Jan-2016	Annual Average ³
<i>Revolon Slough – Wood Road (04_WOOD)</i>												
Total Copper	µg/L	19	19	3.1	3.4	5.9	4.4	204	1390	138.4	42.3	
Total Nickel	µg/L	13	42	6.1	8.6	9.7	9.1	74 ⁴	74 ⁴	78.7	30.9	
Total Selenium	µg/L	13	6	31.2	16.3	16.5	23.6	290 ⁴	290 ⁴	2.3	1.6	
Total Mercury ⁵	lbs/yr	1.7	2					4	--			0.2
<i>Calleguas Creek – Camarillo Street CSUCI (03_UNIV)</i>												
Total Copper	µg/L	19	19	1.7	3.3	3.3	3.7	204	1390	45.7	7.6	
Total Nickel	µg/L	13	42	6.2	5.3	6.6	7.8	74 ⁴	74 ⁴	53.2	6.9	
Total Selenium	µg/L	--	--	0.7	0.5	0.9	0.4	--	--	0.8	0.7	
Total Mercury ⁵	lbs/yr	3.3	3.9					10.5	--			0.2

1. Interim Dry Weather wasteload allocations for Stormwater Dischargers; effective until March 2022 (R4-2006-0012)

2. Interim Dry Weather load allocations for Irrigated Agriculture; effective until March 2022 (R4-2006-0012)

3. Mercury allocation is assessed as an annual load in suspended sediment. The water column mercury concentrations were used in calculating the loads, conservatively assuming that all mercury is on suspended sediment rather than being dissolved. The loads at each site are based on estimated annual concentrations (average of all monitored events at each site) and total annual flow calculated from preliminary streamflow data received from real time data loggers.

4. No wet weather exceedances of these constituents were observed in the TMDL analysis so no interim limits were assigned for the TMDL. For comparison purposes the wet weather targets are included in the table.

5. Interim wasteload allocations and load allocations are expressed as annual loads. Total annual flow for 07/01/15 to 06/31/16 into Mugu Lagoon from Calleguas Creek and Revolon Slough is calculated as 5,247 Mgal/yr. As such, the interim wasteload allocation and load allocation shown correspond to the flow range of 0 to 15,000 to Mgal/yr, per R4-2006-0012.

Results in **bold red type** exceed applicable interim wasteload allocation and load allocation.

Results in **green type** are below the applicable allocations.

Table 21. Monthly Mean Salts Concentrations

	Units	Interim Limit WLA LA	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
Revolon Slough – Wood Road (04_WOOD)														
TDS	mg/L	1720 3995	3537	3676	3587	2829	3359	3594	3733	3564	3538	3450	3389	3256
Chloride	mg/L	230 230	202	210	205	162	192	205	213	203	202	197	194	186
Sulfate	mg/L	1289 1962	1872	1945	1899	1498	1778	1902	1976	1886	1872	1826	1794	1724
Boron	mg/L	1.3 1.8	1.8	1.9	1.9	1.5	1.8	1.9	1.9	1.9	1.8	1.8	1.8	1.7
Calleguas Creek – University Drive CSUCI (03_UNIV)														
TDS	mg/L	1720 3995	1027	1024	1046	1113	1058	949	995	1011	1047	1032	1082	1121
Chloride	mg/L	230 230	214	214	219	233	221	197	207	211	219	216	226	235
Sulfate	mg/L	1289 1962	266	265	271	287	274	247	258	262	271	267	280	289
Conejo Creek – Howard Road Bridge (9A_HOWAR)														
TDS	mg/L	1720 3995	963	947	962	1044	968	877	935	951	974	961	1007	1047
Chloride	mg/L	230 230	206	202	206	224	207	186	200	203	208	205	216	225
Sulfate	mg/L	1289 1962	253	248	252	274	254	230	245	249	255	252	264	275
Conejo Creek – Baron Brothers Nursery (9B_BARON)														
TDS	mg/L	1720 3995	734	737	756	764	773	749	766	722	731	716	700	715
Chloride	mg/L	230 230	165	166	171	173	175	169	173	162	164	161	157	161
Sulfate	mg/L	1289 1962	180	181	190	194	199	187	195	174	178	171	163	170
Arroyo Simi – Tierra Rejada Road (07_TIERRA)														
TDS	mg/L	1720 3995	1164	1140	1146	1139	1157	1135	1171	1124	1149	1143	1150	1175
Chloride	mg/L	230 230	175	172	172	171	174	171	176	169	173	172	173	177
Sulfate	mg/L	1289 1962	452	437	441	436	447	435	456	429	442	439	443	458
Boron	mg/L	1.3 1.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

Notes:

- a. Monthly dry weather mean salt concentrations were generated using mean daily salt concentrations (from 5-min data) for days that met the definition of dry weather in the Salts TMDL (i.e., discharge < 86th percentile flow and no measureable rain in preceding 24 hrs). The 86th percentile of mean daily discharge at 03_Univ (generated using 5-min discharge data for the period July 1, 2015-June 30, 2016) was used as the flow-related threshold for distinguishing wet and dry days for all five compliance sites. Daily precipitation records for 24 gages in the CCW watershed (accessed via the VCWPD Hydrologic Data Server) were used to determine days with “measureable precipitation”. Days were considered as having measureable precipitation if two or more rain gages in the watershed received 0.1 inch or more of precipitation. Results in **bold red type** exceed both the applicable interim wasteload allocation and load allocation. Results in **bold purple type** exceed the interim wasteload allocation, but not the interim load allocation. Results in **green type** are below the applicable allocations.

POTW DATA COMPARISON

Table 22. Nitrogen Compounds – POTWs

Site & Constituent	Units	Final WLA ¹	Event 50 Dry Aug-15	Event 51 Dry Nov-15	Event 54 Dry Feb-16	Event 55 Dry May-16
<i>Simi Valley Water Quality Control Plant (07D_SIMI)</i>						
Ammonia-N	mg/L	3.5 ² , 7.8 ³	1.1	1.4	1.3	1.3
Nitrate-N	mg/L	9	5.6	6.6	7.2	7.0
Nitrite-N	mg/L	0.9	0.01	0.02	0.01	0.01
Nitrate-N + Nitrite-N	mg/L	9	5.6	5.1	7.2	7
<i>Camarillo Water Reclamation Plan (9AD_CAMA)</i>						
Ammonia-N	mg/L	3.1 ² , 5.6 ³	1.3	1.2	0.7	0.8
Nitrate-N	mg/L	9	7.9	5.6	8.4	6.4
Nitrite-N	mg/L	0.9	ND	ND	ND	ND
Nitrate-N + Nitrite-N	mg/L	9	7.9	5.6	8.4	6.4
<i>Hill Canyon Wastewater Treatment Plant (10D_HILL)</i>						
Ammonia-N	mg/L	2.4 ² , 3.3 ³	1.6	1.6	1.4	1.4
Nitrate-N	mg/L	9	8.7	9.0	7.7	8.1
Nitrite-N	mg/L	0.9	ND	ND	ND	ND
Nitrate-N + Nitrite-N	mg/L	9	8.7	9.0	7.7	8.1

ND=constituent not detected at the MDL.

1. The effective date for these wasteload allocations was July 16, 2007 (R4-2008-009)

2. Wasteload allocations as Average Monthly Effluent Limit

3. Wasteload allocations as Maximum Daily Effluent Limit

Results in green type are below the applicable allocations.

Table 23. OC Pesticides, PCBs, and Siltation - POTWs

POTW & Constituent	Units	Final WLA ¹	Event 50 Dry Aug-2015	Event 51 Dry Nov-2015	Event 54 Dry Feb-2016	Event 55 Dry May-2016
<i>Camarillo Water Reclamation Plant (9AD_CAMA)</i>						
Total Chlordane ²	ng/L	1.2	ND	ND	ND	ND
4,4'-DDD	ng/L	1.7	ND	ND	ND	ND
4,4'-DDE	ng/L	1.2	ND	ND	ND	ND
4,4'-DDT	ng/L	1.2	ND	ND	ND	ND
Dieldrin	ng/L	0.28	ND	ND	ND	ND
PCBs ³	ng/L	0.34	ND	ND	ND	ND
Toxaphene	ng/L	0.33	ND	ND	ND	ND
<i>Hill Canyon Wastewater Treatment Plant (10D_HILL)</i>						
Total Chlordane ²	ng/L	1.2	ND	ND	ND	ND
4,4'-DDD	ng/L	1.7	ND	ND	ND	ND
4,4'-DDE	ng/L	1.2	ND	ND	ND	ND
4,4'-DDT	ng/L	1.2	ND	ND	ND	ND
Dieldrin	ng/L	0.28	ND	ND	ND	ND
PCBs ³	ng/L	0.34	ND	ND	ND	ND
Toxaphene	ng/L	0.33	ND	ND	ND	ND
<i>Simi Valley Water Quality Control Plant (07D_SIMI)</i>						
Total Chlordane ²	ng/L	1.2	ND	ND	ND	ND
4,4'-DDD	ng/L	1.7	ND	ND	ND	ND
4,4'-DDE	ng/L	1.2	ND	ND	ND	ND
4,4'-DDT	ng/L	1.2	ND	ND	ND	ND
Dieldrin	ng/L	0.28	ND	ND	ND	ND
PCBs ³	ng/L	0.34	ND	ND	ND	ND
Toxaphene	ng/L	0.33	ND	ND	ND	ND

ND=constituent not detected at the MDL.

1. Final wasteload allocations were added to each of the POTWs' permits in 2015.

2. Total chlordane is the sum of alpha and gamma-chlordane.

3. PCBs concentrations are the sum of the seven aroclors identified in CTR (1016, 1221, 1232, 1242, 1248, 1254, and 1260).

Results in green type are below the applicable allocations.

Table 24. Toxicity, Chlorpyrifos, and Diazinon - POTWs

POTW & Constituent	Units	Final WLA	Event 50 Dry Aug-2015	Event 51 Dry Nov-2015	Event 54 Dry Feb-2016	Event 55 Dry May-2016
<i>Camarillo Water Reclamation Plant (9AD_CAMA)</i>						
Chlorpyrifos	µg/L	0.0133	ND	ND	ND	ND
Diazinon	µg/L	0.1	ND	ND	ND	ND
<i>Hill Canyon Wastewater Treatment Plant (10D_HILL)</i>						
Chlorpyrifos	µg/L	0.014	ND	ND	ND	ND
Diazinon	µg/L	0.1	ND	ND	ND	ND
<i>Simi Valley Water Quality Control Plant (07D_SIMI)</i>						
Chlorpyrifos	µg/L	0.014	0.003	ND	ND	ND
Diazinon	µg/L	0.1	ND	ND	ND	ND

ND=constituent not detected at MDL.

Results in green type are below the applicable allocations.

Table 25. Metals - POTWs

POTW & Constituent	Units	Daily Max WLA	Monthly Avg WLA	WLA	Event 50 Dry Aug-2015	Event 51 Dry Nov-2015	Event 54 Dry Feb-2016	Event 55 Dry May-2015
<i>Camarillo Water Reclamation Plant (9AD_CAMA)</i>								
Total Copper	µg/L	57.0 ¹	20.0 ¹	--	3.5	4.6	4.4	4.2
Total Nickel	µg/L	16.0 ¹	6.2 ¹	--	3.0	3.1	2.8	2.5
Total Mercury ³	lbs/month ⁴	--	--	0.03 ¹	0.0004	0.0007	0.00007	0.00002
<i>Hill Canyon Wastewater Treatment Plant (10D_HILL)</i>								
Total Copper	µg/L	20.0 ¹	16.0 ¹	--	1.9	0.9	2.6	1.6
Total Nickel	µg/L	8.3 ¹	6.4 ¹	--	2.1	2.1	2.0	2.0
Total Mercury ³	lbs/month ⁴	--	--	0.23 ¹	0.02	0.02	0.02	0.02
<i>Simi Valley Water Quality Control Plant (07D_SIMI)</i>								
Total Copper	µg/L	31.0 ²	30.5 ²	--	5.2	5.2	3.8	3.2
Total Nickel	µg/L	960 ²	169 ²	--	1.9	1.7	1.2	1.7
Total Mercury ³	lbs/month ⁴	--	--	0.18 ¹	0.002	0.004	0.002	0.04

1. Interim wasteload allocation; effective until March 26, 2017 (R4-2006-012)

2. Final wasteload allocation; effective date was March 26, 2007 (R4-2006-012)

3. For total mercury concentrations reported as not detected (ND); one half of the method detection limit was used to calculate the monthly loads

4. During load calculation, the average monthly flow for each POTW was multiplied by the number of days in the month corresponding to when the sample was collected to get a total monthly flow. The total monthly flow was multiplied by the concentration of total mercury to yield the monthly total mercury load in pounds.

Results in green type are below the applicable allocations.

Table 26. Salts - POTWs

POTW & Constituent	Units	Monthly Avg Interim WLA	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
<i>Camarillo Water Reclamation Plant (9AD_CAMA) ¹</i>														
Boron	mg/L	N/A	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.6	0.5
Chloride	mg/L	216	217	222	215	216	215	211	203	218	215	226	222	225
Sulfate	mg/L	283	309	293	263	285	266	175	155	265	250	256	256	267
Total Dissolved Solids	mg/L	1012	1200	1116	1010	1196	1100	1026	880	1062	1126	1106	1188	1188
<i>Hill Canyon Wastewater Treatment Plant (10D_HILL)</i>														
Boron	mg/L	N/A	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
Chloride	mg/L	189	153	152	164	158	165	167	165	163	158	163	163	167
Sulfate	mg/L	N/A	164	165	189	165	185	181	145	189	137	135	135	133
Total Dissolved Solids	mg/L	N/A	690	699	749	713	732	734	666	745	662	669	679	671
<i>Simi Valley Water Quality Control Plant (07D_SIMI)</i>														
Boron	mg/L	N/A	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	05	0.5	0.6
Chloride	mg/L	183	150	149	156	151	153	159	159	156	148	159	155	165
Sulfate	mg/L	298	223	226	246	225	225	233	198	249	212	217	223	240
Total Dissolved Solids	mg/L	955	750	732	769	750	786	763	734	814	684	771	800	825

N/A: "The 95th percentile concentration is below the Basin Plan objective so interim limits are not necessary."

Results in **bold red type** exceed applicable interim wasteload allocation.

Results in **green type** are below the applicable allocations.

1. Due to water conservation and alterations in the composition of the water supply available in the POTW service area, effluent salt concentrations have increased since the adoption of the TMDL. The increased salts concentrations are being addressed through a Time Schedule Order that provides for higher TDS and sulfate interim limits and a stay of interim limits for chloride (SWRCB WQO 2003-0019).

DATA COMPARISON DISCUSSION

OC Pesticides, Toxicity, Metals, Nutrients, and Salts

The data comparisons shown in Table 17 through Table 26 above demonstrate that for the most part, the CCW is meeting the applicable interim or final wasteload allocations and load allocations currently in effect for the Nutrients, OC Pesticides, Toxicity, Salts, and Metals TMDLs. The following observations summarize the comparison:

1. No exceedances of the interim wasteload allocations or load allocations for OCs or PCBs were observed at any location in the watershed.
2. Exceedances of numeric targets for Nitrate-N and Nitrate-N + Nitrite-N were observed in Mugu Lagoon, Revolon Slough, Beardsley Wash, Calleguas Creek, and Arroyo Simi. Most of the exceedances occurred during dry events, but there were 12 wet weather exceedances in Mugu Lagoon, Calleguas Creek, and Beardsley Wash. No exceedances of final nutrient wasteload allocations were measured at any POTW compliance site.
3. Two exceedances of the final MS4 wasteload allocations for chlorpyrifos were measured at receiving water sites during the dry weather; however, there were no exceedances of the interim load allocations. There were six exceedances of the final MS4 chlorpyrifos wasteload allocation during wet weather, but there were no instances where the chlorpyrifos concentration was above the interim load allocation. In addition, there was one instance where the diazinon final MS4 wasteload allocation was exceeded during wet weather and no instances where the interim load allocation was exceeded. These exceedances were considered in concert with MS4 outfall monitoring data and MS4 outfalls only exceeded the final allocations during 1 of these monitoring events. There were no exceedances of the final wasteload allocations for chlorpyrifos or diazinon at any POTW.
4. There were four exceedances of the interim load allocation and interim wasteload allocation for total selenium measured during the dry weather sampling events at the 04_WOOD site. As discussed in the TMDL, a primary source of selenium in Revolon Slough is considered to be rising groundwater levels and the interim allocations were to be considered in this context. Additionally, there was one wet weather exceedance of the interim allocation for total nickel at the 04_WOOD site.
5. Although toxicity was observed at some locations in the watershed, toxicity events did not meet the TIE triggering requirements as detailed in the QAPP. As a result, the Stakeholders are in compliance with the toxicity wasteload allocations and load allocations per the requirements of the TMDL.
6. In general, receiving water sites were in compliance with interim load allocations and MS4 wasteload allocations established by the Salts TMDL; the only exception being exceedances in TDS, sulfate, and boron measured at 04_WOOD in the Revolon Slough watershed, and two chloride exceedances at 03_UNIV. POTWs are meeting interim salts wasteload allocations, with the exception of Camarillo Water Reclamation Plant (WRP), which experienced exceedances of chloride, sulfate, and TDS. The exceedances of interim salts wasteload allocations for the Camarillo WRP have resulted from increased influent salt concentrations due to water conservation and a shift in the composition of

the water supplied within the service area. Because the process for addressing salts is a watershed effort involving significant capital investments, the Camarillo WRP received an amended Time Schedule Order in December 2015 (R4-2011-0126-A03) to adjust the interim limits for TDS, sulfate and chloride (TSO limits: 1242 mg/L TDS, 359 mg/L sulfate, 351 mg/L chloride). As a result, the interim limits in the TMDL are not the currently applicable interim limits for the Camarillo WRP discharge.

Nutrients

Exceedances of numeric targets for Nitrate-N and Nitrate-N + Nitrite-N were observed at sites in Mugu Lagoon, Calleguas Creek, Revolon Slough, Beardsley Wash, and Arroyo Simi. Nitrate-N exceedances are summarized in Table 27 below. The table focuses on Nitrate-N results since Nitrate-N + Nitrite-N exceedances were caused by high Nitrate-N values. Nitrite-N was below the 1 mg/L target at all sites for every event.

Table 27. Exceedances of Nitrate-N Numeric TMDL Target of 10 mg/L

Nitrogen TMDL Compliance Sites	Event 50 Dry Aug-15	Event 51 Dry Nov-15	Event 52 Wet Jan-16	Event 53 Wet Jan-16	Event 54 Dry Feb-16	Event 55 Dry May-16
01_RR_BR	Yes	Yes	Yes	Yes	Yes	Yes
02_PCH	Yes	Yes	Yes	Yes	Yes	Yes
03_UNIV	No	No	No	No	No	Yes
04_WOOD	Yes	Yes	No	No	Yes	Yes
05_CENTR	Yes	Yes	Yes	Yes	Yes	Yes
06_SOMIS	NS	No	--	--	--	--
07_HITCH	No	No	No	No	Yes	No ¹
9B_ADOLF	No	No	No	No	No	No

NR=not required, NS=no sample, dry

No signifies that monitoring results were below the Nitrate-N target during the monitoring event.

Yes signifies that monitoring results were above the Nitrate-N target during the monitoring event.

1. Nitrate-N result did not exceed 10 mg/L, however, Nitrate-N + Nitrite-N result did exceed 10 mg/L with a sum of 10.08 mg/L.

Nitrogen exceedances occurred primarily in areas of the watershed with agricultural inputs. Reaches downstream of POTW discharges are generally in compliance with the TMDL requirements and urban discharges were determined to be negligible during the TMDL analysis and therefore do not have TMDL allocations. The final nitrogen load allocations for agriculture became effective in July 2010. Under the 2016 Conditional Waiver (Order No. R4-2016-0143), agricultural dischargers have until October 14, 2025 to comply with the nitrogen load allocations. The Water Quality Management Plans developed by VCAILG for compliance with the Conditional Waiver will specify steps and milestones that work towards achieving these load allocations through the implementation of management practices.

Chlorpyrifos

Further examination of the chlorpyrifos exceedances at receiving water sites was needed to determine whether urban dischargers were contributing. The final wasteload allocations for urban dischargers are in effect and per the TMDL compliance is to be assessed in the receiving waters. Until March 2016, agricultural dischargers were required to meet interim load

allocations, which allow higher concentrations of chlorpyrifos. It is only Event 55 when final allocations for both urban and agricultural dischargers were effective and no exceedances occurred.

Monitoring data at urban land use sites from each subwatershed for which an exceedance was observed in the receiving water was compared to the wasteload allocation to determine if MS4 discharges significantly contributed to the exceedance. If the urban land use data were below the wasteload allocation, the MS4 dischargers were considered to be meeting allocations. If the urban land use data were above the wasteload allocation, the MS4 could be contributing to the exceedance in the receiving water.

As shown in Table 28, there were eight exceedances of chlorpyrifos targets at the receiving water sites. In most cases, urban land use data for the same event were less than the final MS4 wasteload allocation for chlorpyrifos. However, in one case, the urban land use data for the same event exceeded the final wasteload allocation, indicating that urban discharge may be a contributor to the exceedance in the receiving water.

The interim wasteload allocation for diazinon was exceeded at one site during the first wet event. As there are no urban land use sites within this subwatershed, no further evaluation was done.

Table 28. Compliance and Land Use Sites Comparison to Determine MS4 Chlorpyrifos WLA Compliance

Sites Exceeding WLAs	Constituent	Event 50 Dry Aug-15	Event 51 Dry Nov-15	Event 52 Wet Jan-16	Event 53 Wet Jan-16	Event 54 Dry Feb-16	Event 55 Dry May-16
01_RR_BR	Chlorpyrifos			NA ¹			
03_UNIV	Chlorpyrifos			NA ¹	NA ¹	NA ¹	
04_WOOD	Chlorpyrifos			No	No		
06_SOMIS	Chlorpyrifos		NA ¹				
9B_ADOLF	Chlorpyrifos			Yes ²			
03_UNIV	Diazinon			NA ¹			

No= none of the MS4 land use site for the subwatershed exceeded the MS4 wasteload allocation during the monitoring event.

Yes=the MS4 land use site for the subwatershed exceeded the MS4 wasteload allocation during the monitoring event.

1. There are no urban land use monitoring sites in these reaches.

2. The urban land use site exceeded the MS4 wasteload allocation.

Blank cells indicate that a wasteload allocation exceedance did not occur at the compliance monitoring site during a particular event.

Selenium

Selenium concentrations in Revolon Slough at 04_WOOD exceeded the urban dischargers interim wasteload allocation and the agricultural dischargers interim LA during all four dry weather monitoring events. A summary of monitoring results for total selenium at sites in the Revolon Slough subwatershed is shown in Table 29 below.

Table 29. Selenium Monitoring Data (ug/L) in the Revolon Slough Subwatershed

Site ID	Use	Dry Weather Events					
		Interim		50	51	54	55
		WLA ¹	LA ¹	Aug-15	Nov-15	Feb-16	May-16
04_WOOD	RW	13	6	31.2	16.3	16.5	23.6
04D_WOOD	Ag		6	NS	0.3	5.2	3.6
05D_SANT_VCWPD	Ag		6	56	58	47.2	49
04D_VENTURA	Urban	13		1.0	0.4	0.4	0.4

1. Interim WLAs for stormwater permittees and interim LAs for agricultural dischargers are effective until March 2022 (R4-2006-012).

2. No wet weather exceedances were observed in the TMDL analysis so no interim limits were assigned for the TMDL. For comparison purposes, the wet weather targets were included in this table.

RW – Receiving water compliance site; Ag – Agricultural; Urban – Urban

NS – Not sampled, dry

Results in **bold type** exceed applicable interim WLA or interim LA.

As noted in the table above, high levels of selenium were also observed at 05D_SANT_VCWPD, an agricultural use site in the upper reach of the subwatershed. As discussed in the TMDL, a primary source of selenium in Revolon Slough is considered to be rising groundwater levels and the interim allocations were to be considered in this context.

Salts

A summary of monitoring results for total dissolved solids, sulfate, and boron at sites in the Revolon Slough subwatershed are shown in Table 30 through Table 32 below. Mean monthly dry weather TDS, sulfate, and boron concentrations in Revolon Slough at 04_WOOD exceeded their respective interim MS4 WLAs during all twelve months of the monitoring period. In addition, mean monthly dry weather boron, and sulfate concentrations in Revolon Slough at 04_WOOD exceeded their respective load allocations during seven and three months of the monitoring period, respectively.

Site 04D_WOOD represents agricultural discharge water quality in the Revolon Slough subwatershed. Samples were not taken at Site 04D_WOOD during the August 2015 sampling event due to no flow being present. Boron was the only salt constituent that exceeded its interim LAs at this site during the other quarterly dry weather events (in February 2016). Concentrations of salts at 04D_VENTURA, which is an urban land use site in the upper Revolon Slough watershed, were consistently below the interim MS4 WLAs for TDS, sulfate, and boron.

Table 30. Total Dissolved Solids Monitoring Data (mg/L) in Revolon Slough

Site ID	Use	Interim Limits WLA	LA	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
04_WOOD ¹	RW	1720	3995	3537	3676	3587	2829	3359	3594	3733	3564	3538	3450	3389	3256
04D_WOOD ²	Ag		3995		NS			1070			3210			2410	
04D_VENTURA ²	Urban	1720			1490			990			1450			870	

NS=no sample, dry

1. Data presented are monthly means

2. Data presented are quarterly dry weather grabs

Results in **bold type** exceed applicable interim wasteload allocation or interim load allocation.

Table 31. Sulfate Monitoring Data (mg/L) in Revolon Slough

Site ID	Use	Interim Limits WLA	LA	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
04_WOOD ¹	RW	1289	1962	1872	1945	1899	1498	1778	1902	1976	1886	1872	1826	1794	1724
04D_WOOD ²	Ag		1962		NS			421			1883			1200	
04D_VENTURA ²	Urban	1289			495.2			275.6			392.4			238.1	

NS=no sample, dry

1. Data presented are monthly means

2. Data presented are quarterly dry weather grabs

Results in **bold type** exceed applicable interim wasteload allocation or interim load allocation.

Table 32. Boron Monitoring Data (mg/L) in Revolon Slough

Site ID	Use	Interim Limits WLA	LA	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16
04_WOOD ¹	RW	1.3	1.8	1.84	1.91	1.87	1.47	1.75	1.87	1.94	1.85	1.84	1.79	1.76	1.69
04D_WOOD ²	Ag		1.8		NS			0.57			1.83			1.55	
04D_VENTURA ²	Urban	1.3			0.92			0.35			0.56			0.35	

NS=no sample, dry

1. Data presented are monthly means

2. Data presented are quarterly dry weather grabs

Results in **bold type** exceed the applicable interim wasteload allocation or interim load allocation

Revisions and Recommendations

The QAPP specifies that upon the completion of each CCWTMP annual report, revisions to standard procedures will be made, including: site relocation, ceasing monitoring efforts and/or deleting certain constituents from sample collection. An updated QAPP was submitted in December 2014 that incorporated the proposed revisions and recommendations included in the previous six CCWTMP annual reports. Additional modifications that reflect the most current lab methods and procedures for the field conditions were also part of the QAPP update process. Monitoring for the 2015-2016 monitoring year was per the revised QAPP.

The revised QAPP details the replacement of two urban land use sites in reach 7 to match sites used for the Ventura Countywide Stormwater Quality Management Program. This report displayed past data from the two original CCWTMP sites (07D_CTP and 07T_DC_H) alongside the new site locations (07D_MPK and 07D_CIM_BUS). Future reports will simply report on the current and past monitoring at the new sites.

In addition to the updates identified in the 2014 Revised QAPP, access to 06_SOMIS was revoked by the private landowner whom had previously given permission for monitoring. Due to this change, 06_SOMIS could only be visited during the first two monitoring events of the 2015/2016 monitoring year. In future years, monitoring will take place at a downstream site location still within Reach 6 and where access to the site is via County property. Details will be provided in the 9th annual monitoring report.

Appendix A:
Monitoring Event Summaries for Toxicity, OC
Pesticides, Nutrients, Metals, and Salts

Event 50 – Water & Sediment

Calleguas Creek Watershed TMDL Monitoring Program

Post Event Summary

Event 50: Quarterly and Sediment Sampling

Sampling Crews: Kinnetic Laboratories, Inc. (KLI), Fugro
Crew #1: Greg Cotten (KLI), Amy Howk (KLI)
Crew #2: Justin Martos (Fugro), David Thornhill (Fugro), Nicholas Simon (Fugro)

Sampling Dates: **Sediment sites (toxicity and chemistry):** August 4th and 5th, 2015
Receiving water and land use sites: August 5th and 6th, 2015

Sampling Type: Sediment, Water Chemistry, Toxicity, and Salts

SITES SAMPLED

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
01T_ODD2_DCH	8-5-15	X		X	X	X	
02_PCH	8-5-15	X		X	X		
03_UNIV	8-5-15	X	X	X	X	X	
04_WOOD	8-5-15	X	X	X	X	X	
04D_VENTURA	8-5-15	X		X		X	X
05D_SANT_VCWPD	8-5-15	X		X	X	X	X
05_CENTR	8-5-15	X			X		
06T_FC_BR	8-5-15	X			X	X	
07_HITCH	8-5-15	X	X		X	X	
07D_SIM_BUS	8-6-15	X				X	
9B_ADOLF	8-5-15	X	X		X	X	
9BD_ADOLF	8-5-15	X		X		X	X
10_GATE	8-5-15	X	X			X	
13_BELT	8-5-15	X	X			X	
13_SB_HILL	8-6-15	X				X	X
01_RR_BR (LWA sampled)	8-6-15	X		X	X	X	

SITES NOT SAMPLED

Site ID	Reason for Omission
02D_BROOM	Site was dry.
04D_WOOD	Site was dry.
06_SOMIS	Site was dry but sediment samples were collected.
07D_HITCH_LEVEE	Site was dry.
9BD_GERRY	Site was dry.
07D_MPK	Site was dry.

SEDIMENT SAMPLED

Site ID	Date	Sediment Toxicity	Sediment Chemistry
02_PCH	8-4-15	X	X
03_UNIV	8-4-15	X	X
04_WOOD	8-4-15	X	X
06_SOMIS	8-5-15		X
07_HITCH	8-5-15		X
9A_HOWAR	8-4-15	X	X
9B_ADOLF	8-5-15		X

DEVIATIONS FROM QAPP

Site ID	Deviation
02_PCH	Flow was not measured due to tidal influence. Site was sampled near low tide to maximize watershed water.
04_WOOD	<p>The conductivity at the site (4,020 uS/cm) was greater than the accepted range for the designated test species (<i>Ceriodaphnia dubia</i>). The QAPP requires the use of <i>Americamysis bahia</i>. However, <i>Hylella azteca</i> is identified by SWAMP as an appropriate water test species when conductivity is greater than 3,000 us/cm and is currently utilized by the Ventura County Irrigated Lands Group which conducts monitoring in the watershed.</p> <p>To maintain consistency with an existing watershed program, the toxicity testing lab (Pacific EcoRisk) utilized <i>Hylella azteca</i> in place of <i>Americamysis bahia</i>.</p>
04D_VENTURA	Intermediate container (Ziploc bag) used to fill sample bottles.
05D_SANT_VCWPD	Intermediate container (Ziploc bag) used to fill sample bottles.
07D_SIM_BUS	Intermediate container (Ziploc bag) used to fill sample bottles.
9BD_ADOLF	Intermediate container (Ziploc bag) used to fill sample bottles.

FOLLOW UP ACTIONS

None

ADDITIONAL COMMENTS

Water quality field meters passed calibration targets.

06_SOMIS was scheduled to be sampled for both water and sediment. Because it was dry, no water was collected but sediment was collected. The sediment samples were collected only in the areas where recent flow patterns were visible in the sediment.

Photo facing upstream at 13_BELT was accidentally deleted.

Drawings of sediment sample locations are on the backside of the field book log sheets.

Prepared by:	Greg Cotten, KLI	Date:	08-25-15
Reviewed by:	Amy Howk, KLI	Date:	08-25-15
Approved by:	Michael Marson, LWA	Date:	09-02-15

Event 51

Calleguas Creek Watershed TMDL Monitoring Program

Post Event Summary

Event 51: Quarterly Sampling

Sampling Crews: Kinnetic Laboratories, Inc. (KLI), Fugro

Crew #1: Greg Cotten (KLI), Amy Howk (KLI)

Crew #2: Justin Martos (Fugro), Nick Simon (Fugro)

01_RR_BR: Michael Marson (LWA), Zach Helsley (LWA)

Sampling Dates: **Receiving water and land use sites:** November 4th and 5th, 2015

Sampling Type: Water Chemistry, Toxicity, and Salts

SITES SAMPLED

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
01_RR_BR	11/4/15	X		X	X	X	
04D_WOOD	11/5/15	X		X	X	X	X
04_WOOD	11/4/15	X	X	X	X	X	
04D_VENTURA	11/4/15	X		X		X	X
01T_ODD2_DCH	11/4/15	X		X	X	X	
02_PCH	11/4/15	X		X	X		
03_UNIV	11/4/15	X	X	X	X	X	
9B_ADOLF	11/4/15	X	X		X	X	
9BD_ADOLF	11/4/15	X		X		X	X
9BD_GERRY	11/4/15	X		X	X	X	X
05D_SANT_VCWPD	11/5/15	X		X	X	X	X
05_CENTR	11/5/15	X			X		
13_SB_HILL	11/5/15	X				X	X
10_GATE	11/4/15	X	X			X	
13_BELT	11/4/15	X	X			X	

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
06_SOMIS	11/4/15	X	X		X	X	
07D_HITCH_LEVEE	11/4/15	X			X	X	X
07_HITCH	11/4/15	X	X		X	X	
07D_SIM_BUS	11/5/15	X				X	X

SITES NOT SAMPLED

Site ID	Reason for Omission
02D_BROOM	Site was dry
07D_MPK	Site was dry
06T_FC_BR	Site was dry

DEVIATIONS FROM QAPP

Site ID	Deviation
02_PCH	Flow was not measured due to tidal influence. Site was sampled near low tide to maximize watershed water.
04_WOOD	<p>The conductivity at the site (3,690 uS/cm) was greater than the accepted range for the designated test species (<i>Ceriodaphnia dubia</i>). The QAPP requires the use of <i>Americamysis bahia</i>. However, <i>Hylella azteca</i> is identified by SWAMP as an appropriate water test species when conductivity is greater than 3,000 us/cm and is currently utilized by the Ventura County Irrigated Lands Group which conducts monitoring in the watershed.</p> <p>To maintain consistency with an existing watershed program, the toxicity testing lab (Pacific EcoRisk) utilized <i>Hylella azteca</i> in place of <i>Americamysis bahia</i>.</p>
04D_VENTURA	Intermediate container (Ziploc bag) used to fill sample bottles.
04D_WOOD	Intermediate container (Ziploc Bag) used to fill sample bottle #106 (organics) only.
05D_SANT_VCWPD	Intermediate container (Ziploc bag) used to fill sample bottles.
9BD_GERRY	Intermediate container (Ziploc bag) used to fill sample bottles.
07D_SIM_BUS	Intermediate container (Ziploc Bag) used to fill sample bottle #163 (organics) only.
9BD_ADOLF	Intermediate container (Ziploc bag) used to fill sample bottles.

FOLLOW UP ACTIONS

None

ADDITIONAL COMMENTS

Meter 4547 was 12% above the calibration standard for dissolved oxygen in the post-calibration which was above the upper criteria of 10%. The sites samples with this meter were: SOMIS, HITCH, HITCH_LEVEE, SIM_BUS, ADOLF, BD_ADOLF, GERRY, GATE, BELT and SB_HILL.

Dissolved metals were field filtered immediately upon sampling.

The LWA team and the Fugro team met at the Los Posas' gate of Point Mugu. Their base access badges were not totally validated and so the LWA team conducted the sampling at RR_BR.

Prepared by: Amy Howk, KLI

Date: December 9, 2015

Reviewed by: Greg Cotten, KLI

Date: December 11, 2015

Approved by: Michael Marson - LWA

Date: January 22, 2016

Event 52 – Storm 1

Calleguas Creek Watershed TMDL Monitoring Program

Post Event Summary

Event 52: Wet Weather Sampling

Sampling Crews: Kinnetic Laboratories, Inc. (KLI), Fugro
Crew #1: Greg Cotten (KLI), Kagen Holland (KLI)
Crew #2: Amy Howk (KLI), Spencer Johnson (KLI)
Crew #3: Justin Martos (Fugro), David Thornhill (Fugro)
Crew #4: Nick Simon (Fugro), Jeff Polis (Fugro)

Sampling Dates: **Receiving water and land use sites:** January 5th, 2016

Sampling Type: Wet weather water Chemistry, Toxicity, and Salts

SITES SAMPLED

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
01_RR_BR	1-5-16	X		X	X	X	
02_PCH	1-5-16	X		X	X		
03_UNIV	1-5-16	X	X	X	X	X	X
9A_HOWAR	1-5-16	X					X
9B_ADOLF	1-5-16	X	X		X	X	
9BD_ADOLF	1-5-16	X		X		X	X
05D_SANT_VCWPD	1-5-16	X		X	X	X	X
05_CENTR	1-5-16	X			X		
04D_VENTURA	1-5-16	X		X		X	X
04D_WOOD	1-5-16	X		X	X	X	X
04_WOOD	1-5-16	X	X	X	X	X	X
01T_ODD2_DCH	1-5-16	X		X	X	X	
06T_FC_BR	1-5-16	X			X	X	X
07_HITCH	1-5-16	X	X		X	X	
07D_HITCH_LEVEE	1-5-16	X			X	X	X
07_TIERRA	1-5-16	X					X
07D_MPK	1-5-16	X				X	X

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
07D_SIM_BUS	1-5-16	X				X	X
13_SB_HILL	1-5-16	X				X	X
9B_BARON	1-5-16	X					X
9BD_GERRY	1-5-16	X		X	X	X	X
10_GATE	1-5-16	X	X			X	
13_BELT	1-5-16	X	X			X	

SITES NOT SAMPLED

Site ID	Reason for Omission
02D_BROOM	Dry. Stopped flowing before samples could be taken.
06_SOMIS	Site access closed.

DEVIATIONS FROM QAPP

Site ID	Deviation
02_PCH	Flow was roughly estimated due to tidal influence. Site was sampled near low tide (0.4') to minimize ocean influence.
9BD_GERRY	Intermediate container bottle 183 was used for all but metals collection.
07D_MPK	Sample was collected at site ladder upstream of small concrete foot bridge. Upstream of outfall under that bridge.

FOLLOW UP ACTIONS

07D_MPK will be collected downstream of footbridge but upstream of confluence for all future events.

ADDITIONAL COMMENTS

A week to 24 hours prior to the event the forecast was for nearly a 1.0" of rain. The storm increased in speed so only about 0.6" fell.

All sites were sampled but 02_BROOM because the flow stopped before it could be sampled and access to SOMIS was closed. This event could be considered one of our lower flow wet events. All sites were definitely elevated and clearly exhibiting runoff conditions but because of the nature of the watershed size and diverse micro climates this event almost didn't happen. Much less rain would have started to have more dry sites or sites that were nearly at base flow by the time they were sampled. 0.75 inches continues to be the ideal minimum for all samples to be grabbed on a rising or peak hydrograph.

The only field meter issue was with Team 1's Dissolved Oxygen probe failed post calibration. It's thought that the membrane may have been damaged during sampling. Flow was able to be measured at several of the sites. The sites where the flow was too dangerous to enter, flow was estimated.

Sites where turbidity was measured above 1000 NTU's, turbidity was added to the analyte list on the COC for lab analysis.

Prepared by:	Greg Cotten, KLI	Date:	Jan 21, 2016
Reviewed by:	Amy Howk, KLI	Date:	Jan 26, 2016
Approved by:	Michael Marson - LWA	Date:	April 11, 2016

Event 53 – Storm 2

Calleguas Creek Watershed TMDL Monitoring Program

Post Event Summary

Event 53: Wet Weather Sampling

Sampling Crews: **Crew #1:** Greg Cotten (KLI), Brian Homberger (KLI)
Crew #2: Amy Howk (KLI), Aidas Worthington (KLI)
Crew #3: Nick Simon (Fugro), Dustin Snyder (Fugro)
Crew #4: Justin Martos (Fugro), David Thornhill (Fugro)

Sampling Dates: **Receiving water and land use sites:** January 31st, 2016

Sampling Type: Wet weather water chemistry, toxicity, and salts

SITES SAMPLED

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
01_RR_BR	1-31-16	X		X	X	X	
02_PCH	1-31-16	X		X	X		
02D_BROOM	1-31-16	X		X	X	X	
03_UNIV	1-31-16	X	X	X	X	X	
9B_ADOLF	1-31-16	X	X		X	X	
9BD_ADOLF	1-31-16	X		X		X	X
05D_SANT_VCWPD	1-31-16	X		X	X	X	X
05_CENTR	1-31-16	X			X		
04D_VENTURA	1-31-16	X		X		X	X
04D_WOOD	1-31-16	X		X	X	X	X
04_WOOD	1-31-16	X	X	X	X	X	
01T_ODD2_DCH	1-31-16	X		X	X	X	
06T_FC_BR	1-31-16	X			X	X	X
07_HITCH	1-31-16	X	X		X	X	
07D_HITCH_LEVEE	1-31-16	X			X	X	X
07D_MPK	1-31-16	X				X	X
07D_SIM_BUS	1-31-16	X				X	X

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
13_SB_HILL	1-31-16	X				X	X
9BD_GERRY	1-31-16	X		X	X	X	X
10_GATE	1-31-16	X	X			X	
13_BELT	1-31-16	X	X			X	

SITES NOT SAMPLED

Site ID	Reason for Omission
06_SOMIS	No site access. Not sampled.

DEVIATIONS FROM QAPP

Site ID	Deviation
04D_VENTURA	Intermediate container (Ziploc bag) used to fill sample bottles.
9BD_ADOLF	Intermediate container (Ziploc bag) used to fill pesticides only.
04D_VENTURA	Photos were not taken
13_SB_HILL	Photos accidentally deleted
07D_SIM_BUS	Photos accidentally deleted

ADDITIONAL COMMENTS

Field meter calibration notes:

Team 1 (13_SB_HILL, 07D_SIM_BUS, 07D_MPK, 07_HITCH, 07D_HITCH_LEVEE_2 and 06T_FC_BR) field meter initial calibration was valid and passed post calibration except for Dissolved Oxygen.

Team 2 (9B_ADOLF, 9BD_ADOLF, 9BD_GERRY, 10_GATE and 13_BELT) field meter initial calibration was valid except for turbidity and passed all others in post calibration. Turbidity was collected as grab samples and analysed with Team 1 meter within 7 hours of collection.

Team 3 (05D_SANT_VCWPD, 05_CENTR, 04D_VENTURA, 04_WOOD and 04D_WOOD) field meter initial calibration was valid but failed Dissolved oxygen and turbidity post calibration.

Team 4 (03_UNIV, 02D_BROOM, 01T_ODD2_DCH, 02_PCH and 01_RR) field meter initial calibration was valid except for turbidity and passed all others in post calibration. Turbidity was collected as grab samples and analysed with Team 1 meter within 7.5 hours of collection. 01T_ODD2_DCH turbidity grab was not taken.

Post event conductivity standard was contaminated and meters were reanalyzed with new standard back at lab. All meters passed conductivity post sampling calibration check.

Meter exceedences:

Sites where turbidity exceeded 1000 NTU (field meter maximum) Turbidity was added to the site COC for laboratory analysis. These sites were: 06T_FC_BR, 05D_SANT_VCWPD, 05_CENTR and 04_WOOD.

Flow:

Due to dangerous flow conditions, flow was estimated at all sites except 07D_MPK, 07_HITCH, 07D_HITCH_LEVEE, 06T_FC_BR, 9BD_ADOLF, 9BD_GERRY, 04D_VENTURA, 01T_ODD2_DCH and 04D_WOOD where flow was measured using preferred methods.

Metals Sampling:

To decrease the sediment load on the filters, field crews used a 1L amber glass jar that was cleaned for metals analysis to allow the stormwater to settle prior to pouring it into the filter. This was done at: 9BD_ADOLF, 9BD_GERRY and 05D_SANT_VCWPD.

FOLLOW UP ACTIONS

None

Prepared by:	Greg Cotten, KLI	Date:	March 04, 2016
Reviewed by:	Amy Howk, KLI	Date:	March 21, 2016
Approved by:	Michael Marson, LWA	Date:	April 11, 2016

Event 54

Calleguas Creek Watershed TMDL Monitoring Program

Post Event Summary

Event 54: Quarterly Sampling

Sampling Crews: Kinnetic Laboratories, Inc. (KLI), Fugro

Crew #1: Greg Cotten (KLI), Aidas Worthington (KLI)

Crew #2: David Thornhill (Fugro), Nick Simon (Fugro)

Sampling Dates: **Receiving water and land use sites:** February 24th and 25th, 2016

Sampling Type: Water Chemistry, Toxicity, and Salts

SITES SAMPLED

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
01_RR_BR	2/24/16	X		X	X	X	
02_PCH	2/24/16	X		X	X		
02D_BROOM	2/24/16	X		X	X	X	
03_UNIV	2/24/16	X	X	X	X	X	
9B_ADOLF	2/24/16	X	X		X	X	
9BD_ADOLF	2/24/16	X		X		X	X
05D_SANT_VCWPD	2/24/16	X		X	X	X	X
05_CENTR	2/24/16	X			X		
04D_VENTURA	2/24/16	X		X		X	X
04D_WOOD	2/24/16	X		X	X	X	X
04_WOOD	2/24/16	X	X	X	X	X	
01T_ODD2_DCH	2/24/16	X		X	X	X	
07_HITCH	2/24/16	X	X		X	X	
07D_SIM_BUS	2/25/16	X				X	X
13_SB_HILL	2/25/16	X				X	X
9BD_GERRY	2/24/16	X		X	X	X	X
10_GATE	2/24/16	X	X			X	

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
13_BELT	2/24/16	X	X			X	

SITES NOT SAMPLED

Site ID	Reason for Omission
06T_FC_BR	Site was dry
07D_HITCH_LEVEE_2	Site was dry
07D_MPK	Site was dry
06_SOMIS	No access at this time

DEVIATIONS FROM QAPP

Site ID	Deviation
9BD_ADOLF	Intermediate container (Ziploc bag) used to fill sample bottles.
05D_SANT_VCWPD	Intermediate container (Ziploc Bag) used to fill sample bottle #126, 122, 117, and 116
9BD_GERRY	Intermediate container (Ziploc bag) used to fill sample bottles. Construction on Bridge - sampled upstream.
01_RR_BR	Photos not taken

ADDITIONAL COMMENTS

Both Quantas passed post-calibration comfortably giving high confidence in their readings throughout the sampling.

Dissolved metals were field filtered immediately upon sampling.

FOLLOW UP ACTIONS

None

Prepared by: Aidas Worthington, KLI

Date: March 8, 2016

Reviewed by: Greg Cotten, KLI

Date: March 22, 2016

Approved by: Michael Marson, LWA

Date: April 12, 2016

Event 55

Calleguas Creek Watershed TMDL Monitoring Program

Post Event Summary

Event 55: Quarterly Sampling

Sampling Crews: Kinnetic Laboratories, Inc. (KLI), Fugro

Crew #1: Greg Cotten (KLI), Aidas Worthington (KLI)

Crew #2: Justin Martos (Fugro), Nick Simon (Fugro)

Sampling Dates: **Receiving water and land use sites:** May 3rd, 2016

Sampling Type: Dry weather sampling: Water Chemistry, Toxicity, and Salts

SITES SAMPLED

Site ID	Sample Date	Constituents					
		General Parameters	Toxicity	Metals	Nutrients	PCBs, OP, OC, and Pyrethroid Pesticides	Salts
01_RR_BR	5/3/16	X		X	X	X	
02_PCH	5/3/16	X		X	X		
02D_BROOM	5/3/16	X		X	X	X	
03_UNIV	5/3/16	X	X	X	X	X	
9B_ADOLF	5/3/16	X	X		X	X	
9BD_ADOLF	5/3/16	X		X		X	X
05D_SANT_VCWPD	5/3/16	X		X	X	X	X
05_CENTR	5/3/16	X			X		
04D_VENTURA	5/3/16	X		X		X	X
04D_WOOD	5/3/16	X		X	X	X	X
04_WOOD	5/3/16	X	X	X	X	X	
01T_ODD2_DCH	5/3/16	X		X	X	X	
07_HITCH	5/3/16	X	X		X	X	
07D_SIM_BUS	5/3/16	X				X	X
13_SB_HILL	5/3/16	X				X	X
10_GATE	5/3/16	X	X			X	
13_BELT	5/3/16	X	X			X	

SITES NOT SAMPLED

Site ID	Reason for Omission
06T_FC_BR	Site was dry
07D_HITCH_LEVEE_2	Site was dry
07D_MPK	Site was dry
9BD_GERRY	Site was dry
06_SOMIS	Site not accessible

DEVIATIONS FROM QAPP

Site ID	Deviation
9BD_ADOLF	Intermediate container (Ziploc bag) used to fill sample bottles.
04D_WOOD	Intermediate container (Ziploc bag) used to fill sample bottles.
04D_VENTURA	Intermediate container (Ziploc bag) used to fill sample bottles.
05D_SANT_VCWPD	Intermediate container (Ziploc bag) used to fill sample bottles.

ADDITIONAL COMMENTS

Both water quality field meters passed post-calibration.

Dissolved metals were field filtered immediately upon sampling.

03_UNIV mercury blank bottle had some small dust like material in bottle once opened.

FOLLOW UP ACTIONS

None

Prepared by: Aidas Worthington, KLI

Date: May 13, 2016

Reviewed by: Greg Cotten, KLI

Date: May 17, 2016

Approved by: Michael Marson, LWA

Date: May 23, 2016

Appendix B:

Calibration Event Summary for Salts TMDL

The following section provides a summary of the monitoring events not covered by the quarterly or wet weather monitoring events completed during the eighth year of monitoring. The continuous sensor sites (03_UNIV, 04_WOOD, 9A_HOWAR, 9B_BARON, and 07_TIERRA) were visited monthly for calibration checks and flow measurements.

SUMMARY OF MONTHLY EVENTS

Monthly sampling events included measuring electrical conductivity (EC), temperature, and chloride (no grab samples were required during these visits). EC and temperature were measured using a Hach SensION5 meter and chloride was measured with Hach Quantab titration strips. The following table provides the date and constituents measured for each salt sensor monthly monitoring event.

Table 1. Monthly Salt Sensor Site Visits

Month	Site ID	Date Visited	EC	Chloride	Flow
August 2015	04_WOOD	08/04/2015	X	X	X
	03_UNIV	08/04/2015	X	X	X
	07_TIERRA	08/04/2015	X	X	X
	9A_HOWAR	08/04/2015	X	X	X
	9B_BARON	08/04/2015	X	X	X
September 2015	04_WOOD	09/01/2015	X	X	X
	03_UNIV	09/01/2015	X	X	X
	07_TIERRA	09/01/2015	X	X	X
	9A_HOWAR	09/01/2015	X	X	X
	9B_BARON	09/01/2015	X	X	X
	07_TIERRA	09/18/2015	X	X	X
October 2015	04_WOOD	10/07/2015	X	X	X
	03_UNIV	10/07/2015	X	X	X
	07_TIERRA	10/07/2015	X	X	X
	9A_HOWAR	10/07/2015	X	X	X
	9B_BARON	10/07/2015	X	X	X
November 2015	04_WOOD	11/04/2015	X	X	X
	03_UNIV	11/04/2015	X	X	X
	07_TIERRA	11/04/2015	X	X	X
	9A_HOWAR	11/04/2015	X	X	X
	9B_BARON	11/04/2015	X	X	X
	04_WOOD	11/23/2015	X	X	X
December 2015	04_WOOD	12/16/2015	X	X	X
	03_UNIV	12/16/2015	X	X	X
	07_TIERRA	12/16/2015	X	X	X
	9A_HOWAR	12/16/2015	X	X	X
	9B_BARON	12/16/2015	X	X	X
January 2016 - storm	04_WOOD	01/05/2016	X		X
	03_UNIV	01/05/2016	X		X
	07_TIERRA	01/05/2016	X		X
	9A_HOWAR	01/05/2016	X		X
	9B_BARON	01/05/2016	X		X
January 2016	04_WOOD	01/14/2016	X	X	X
	03_UNIV	01/14/2016	X	X	X
	07_TIERRA	01/14/2016	X	X	X
	9A_HOWAR	01/14/2016	X	X	X
	9B_BARON	01/14/2016	X	X	X

Month	Site ID	Date Visited	EC	Chloride	Flow
February 2016	04_WOOD	02/03/2016	X	X	X
	03_UNIV	02/03/2016	X	X	X
	07_TIERRA	02/03/2016	X	X	X
	9A_HOWAR	02/03/2016	X	X	X
	9B_BARON	02/03/2016	X	X	X
March 2016	04_WOOD	03/17/2016	X	X	X
	03_UNIV	03/17/2016	X	X	X
	07_TIERRA	03/17/2016	X	X	X
	9A_HOWAR	03/17/2016	X	X	X
	9B_BARON	03/17/2016	X	X	X
April 2016	04_WOOD	04/07/2016	X	X	X
	03_UNIV	04/07/2016	X	X	X
	07_TIERRA	04/07/2016	X	X	X
	9A_HOWAR	04/07/2016	X	X	X
	9B_BARON	04/07/2016	X	X	X
May 2016	04_WOOD	05/03/2016	X	X	X
	03_UNIV	05/03/2016	X	X	X
	07_TIERRA	05/03/2016	X	X	X
	9A_HOWAR	05/03/2016	X	X	X
	9B_BARON	05/03/2016	X	X	X
June 2016	04_WOOD	06/14/2016	X	X	X
	03_UNIV	06/14/2016	X	X	X
	07_TIERRA	06/14/2016	X	X	X
	9A_HOWAR	06/14/2016	X	X	X
	9B_BARON	06/14/2016	X	X	X
	04_WOOD	06/30/2016	X	X	X
	03_UNIV	06/30/2016	X	X	X
	07_TIERRA	06/30/2016	X	X	X
	9A_HOWAR	06/30/2016	X	X	X
	9B_BARON	06/30/2016	X	X	X
July 2016	04_WOOD	07/11/2016	X	X	X
	04_WOOD	07/22/2016	X	X	X
	03_UNIV	07/22/2016	X	X	X
	07_TIERRA	07/22/2016	X	X	X
	9A_HOWAR	07/22/2016	X	X	X
	9B_BARON	07/22/2016	X	X	X

Appendix C. Rating Curves and EC/Salt Relationships for Salts TMDL Compliance Sites for the July 2015-June 2016 Monitoring Year

RATING CURVES

Continuous water level time series data (5-min intervals) were converted to time series of flow estimates (cfs) using the USGS shift-adjusted rating curve method. The method establishes a base rating for a given date range. Over the date range that shares a base rating, this rating is then shifted, as necessary, for subsets of the data to account for small changes in the geometry of natural channels often caused by deposition, scouring, and vegetation. Rating curves for all sites took the form $Q = c * (Lvl + a + S)^b$ where,

Q = discharge (cfs)

Lvl = water level or “stage”, referenced to depth sensor elevation (cm)

c = scaling coefficient

a = coefficient accounting for the vertical difference between depth sensor elevation (stage = 0) and stage at zero discharge (cm)

b = coefficient accounting for channel shape, natural channels fall between endpoints $b=1.5$ (square channel), and $b=2.5$ (triangular channel).

S = stage shift, typically varies over time for natural channels (cm).

Monthly manual measurements of discharge are performed at all sites and are used to establish base ratings and to determine the required “shifts” (“ S ” in the equation above) over time for a monitoring year. Base rating curve equations used for the July 2015-June 2016 monitoring year are provided in Table 1.

Table 1. Rating Curves for Salts TMDL Compliance Sites for Monitoring Year July 2015-June 2016

Site	Rating Curve
03_UNIV	$Q = 0.29 * (Lvl - 29 + S)^{2.0}$
04_WOOD	$Q = 0.013 * (Lvl - 7.0 + S)^{1.8}$
07_TIERRA	$Q = 0.0154 * (Lvl - 20 + S)^{2.0}$
9A_HOWAR	$Q = 0.010 * (Lvl - 4.0 + S)^{2.2}$
9B_BARON	$Q = 0.044 * (Lvl + 0 + S)^{1.65}$

EC/SALT RELATIONSHIPS

Site-specific, linear relationships between specific conductivity (EC) and salt constituents were used to convert continuous EC sensor data to estimate salt concentrations. Surrogate relationships were derived from field data for EC and salts (grab samples for TDS, sulfate, chloride, or boron from quarterly-dry and up to two wet events per year) using linear regression, in the following form:

$$[\text{Ion}] = A * \text{EC} + B, \quad \text{where,}$$

[Ion] = concentration of TDS, sulfate, chloride, or boron (mg/L)

A = slope

EC = specific conductivity ($\mu\text{S}/\text{cm}$)

B = y intercept

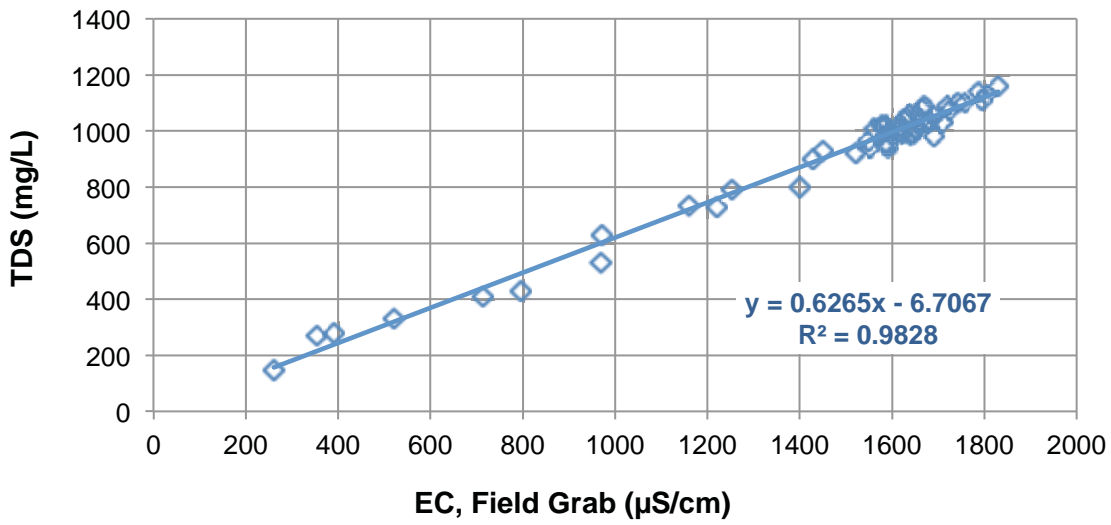
At the conclusion of the 2015/2016 monitoring year, surrogate relationships were updated using linear regression. As is done each year, ANCOVA analysis was performed to detect evidence of statistically significant temporal shifts in surrogate relationships that might signal a change in watershed conditions and justify adjustments in the date ranges of the field data used to construct the relationships. For example, analysis conducted after the 2014/2015 monitoring year showed that changes in date ranges were appropriate for some surrogate relationships related to a shift in the blend of imported water entering the watershed (i.e., a shift to a combination of San Joaquin/Sacramento Delta and Colorado River water imported by Calleguas Municipal Water District in February 2014).

Minor changes in the 2015/2016 relationship parameters resulted from the current year's update, but no changes were made in the start dates of the time frames for the underlying field data for the relationships. However, analysis of the 2011-2016 datasets for sulfate at 07_TIERRA and 9B_BARON revealed that it was appropriate to begin to apply different surrogate relationships for EC-*vs*-sulfate to higher conductivity (drier weather) and lower conductivity (wetter weather) conditions. Different regression equations were derived for high- and low-EC conditions for both sites, and site-specific EC cutoffs were selected without difficulty to separate the 5-min EC sensor records. Surrogate relationships used to process the 2015/2016 EC sensor data are reported in **Table 2** and illustrated in figures following the table.

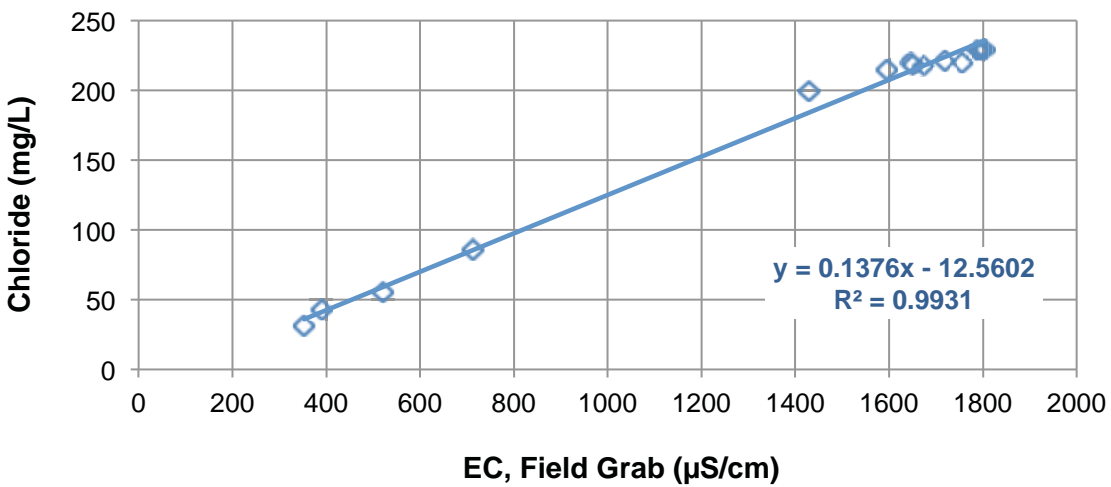
Table 2. Surrogate Relationships Used to Convert EC to Salt Concentrations for the 2015/2016 Monitoring Year

Site	Proxy Relationship	r ²	Underlying Field Data	
			Sample Size	Date Range
03_UNIV	TDS = (0.6262 * EC) - 6.7067	0.9828	54	1/31/2011 – 5/3/2016
	Cl = (0.1376 * EC) - 12.5602	0.9931	14	2/28/2014 - 5/3/2016
	SO4 = (0.1553 * EC) + 9.8192	0.9713	14	2/28/2014 - 5/3/2016
04_WOOD	TDS = (0.9170 * EC) - 186.65	0.9857	53	1/31/2011 – 5/3/2016
	Cl = (0.05167 * EC) - 7.9739	0.9901	13	2/28/2014 - 5/3/2016
	SO4 = (0.4846 * EC) - 95.8997	0.9939	13	2/28/2014 - 5/3/2016
	B = (0.0005 * EC) - 0.1061	0.8863	53	1/31/2011 – 5/3/2016
07_TIERRA	TDS = (0.7099 * EC) - 62.6624	0.9839	42	1/31/2011 – 5/3/2016
	Cl = (0.1078 * EC) - 11.0985	0.9932	13	2/28/2014 - 5/3/2016
	High Conductivity (>1400 µS/cm): SO4 = (0.4321 * EC) - 295.29	0.8198	34	1/31/2011 – 5/3/2016
	Low Conductivity (≤1400 µS/cm): SO4 = (0.2544 * EC) - 21.312	0.9467	8	1/31/2011 – 5/3/2016
	B = (0.0004 * EC) - 0.0645	0.9587	21	8/22/12 - 5/3/2016
9A_HOWAR	TDS = (0.6113 * EC) + 0.0106	0.9859	43	1/31/2011 – 5/3/2016
	Cl = (0.1371 * EC) - 10.2667	0.9893	13	2/28/2014 - 5/3/2016
	SO4 = (0.1612 * EC) -1.4692	0.9732	13	2/28/2014 - 5/3/2016
9B_BARON	TDS = (0.6006 * EC) - 4.8982	0.9731	43	1/31/2011 – 5/3/2016
	Cl = (0.1458 * EC) - 13.9923	0.9791	21	8/28/2012-5/3/2016
	High Conductivity (>1000 µS/cm): SO4 = (0.2967 * EC) -185.5365	0.8241	33	3/20/2011-5/3/2016
	Low Conductivity (≤1000 µS/cm): SO4 = (0.1367 * EC) - 2.7266	0.9727	6	3/20/2011-5/3/2016

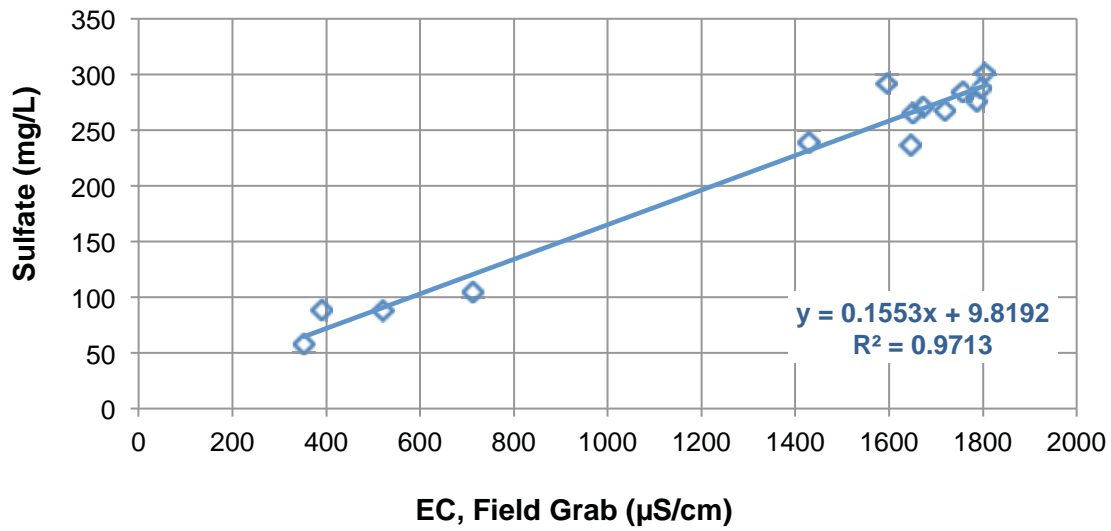
TDS/EC relationship at 03_UNIV



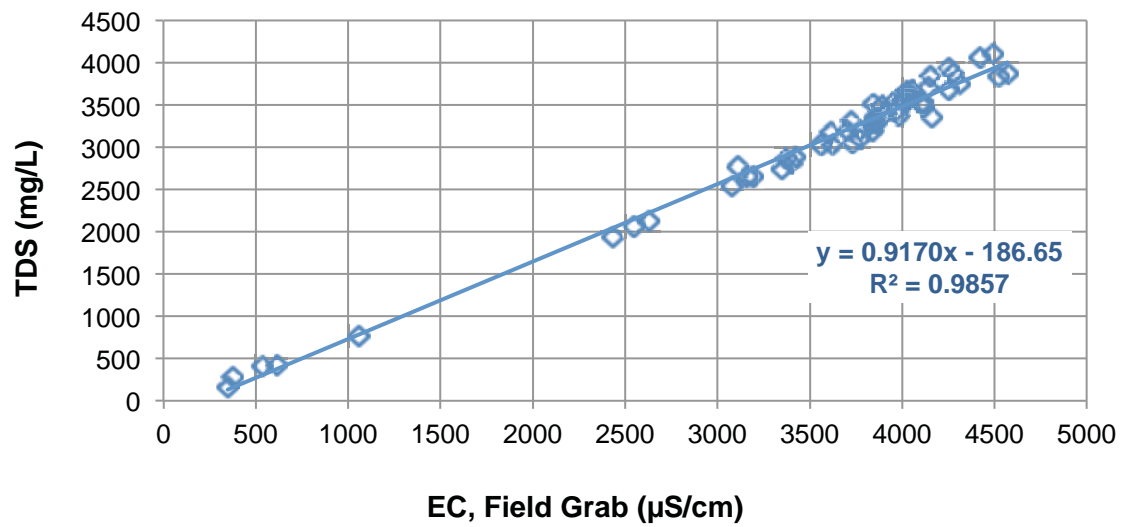
Chloride/EC relationship at 03_UNIV



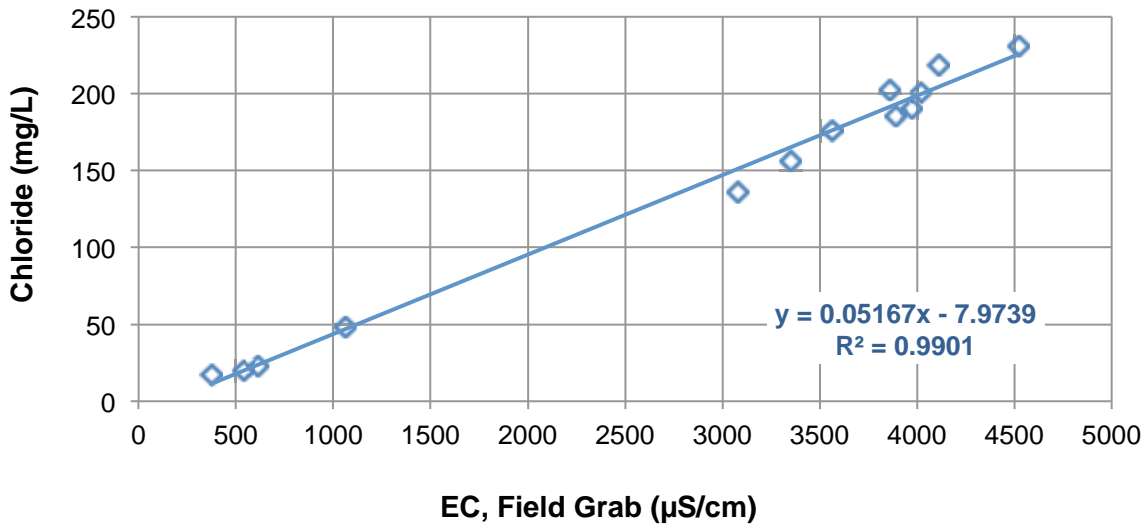
Sulfate/EC relationship at 03_UNIV



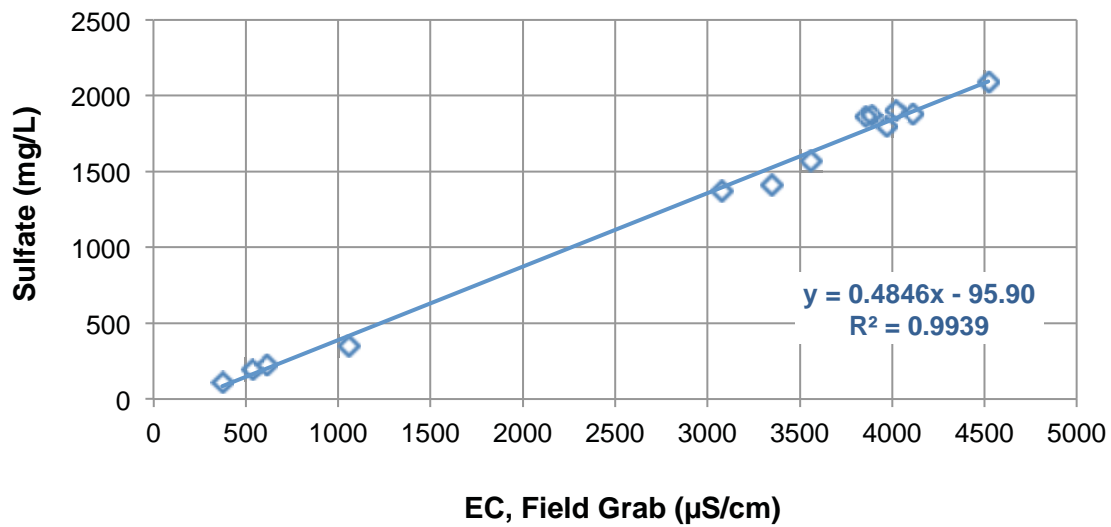
TDS/EC relationship at 04_WOOD

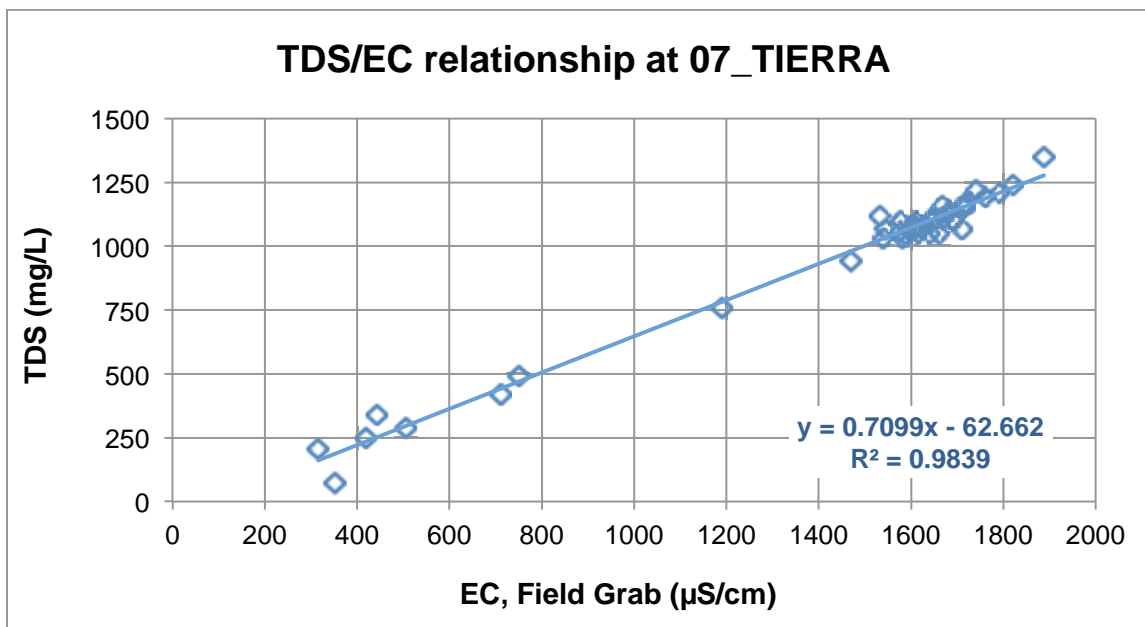
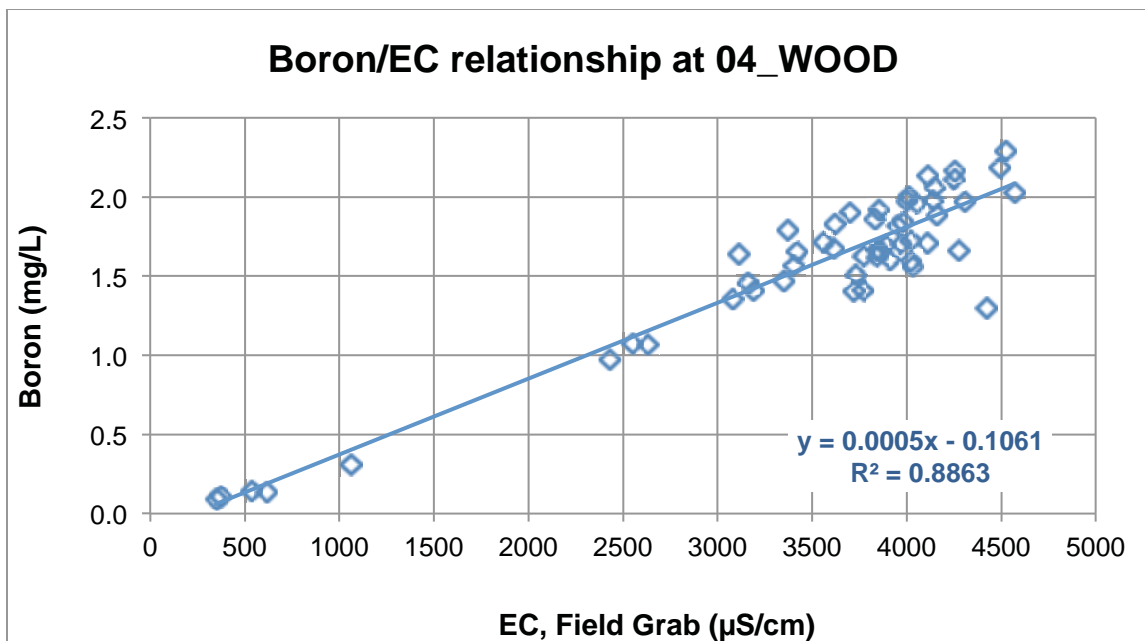


Chloride/EC relationship at 04_WOOD

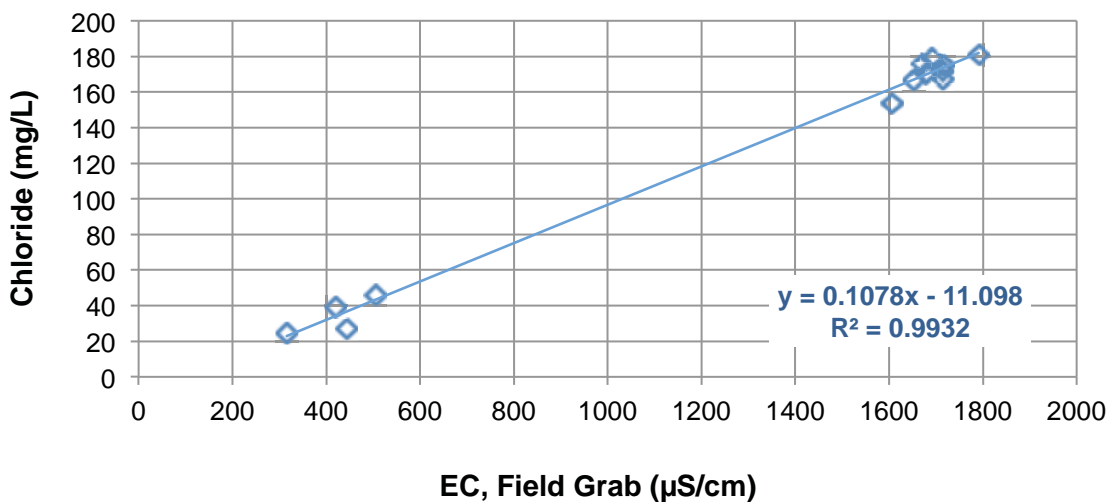


Sulfate/EC relationship at 04_WOOD

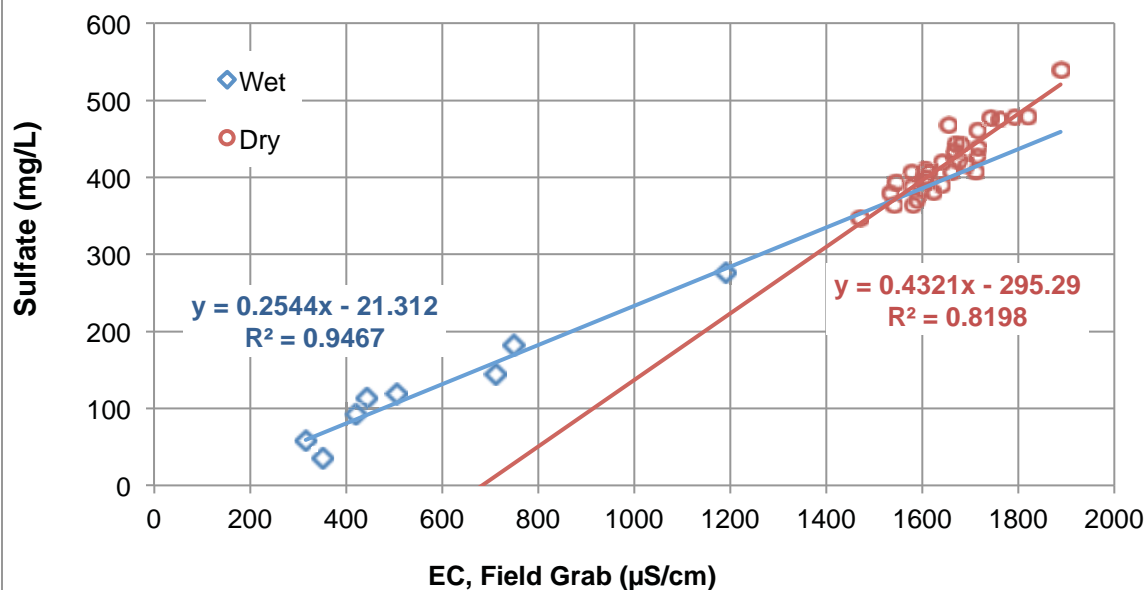


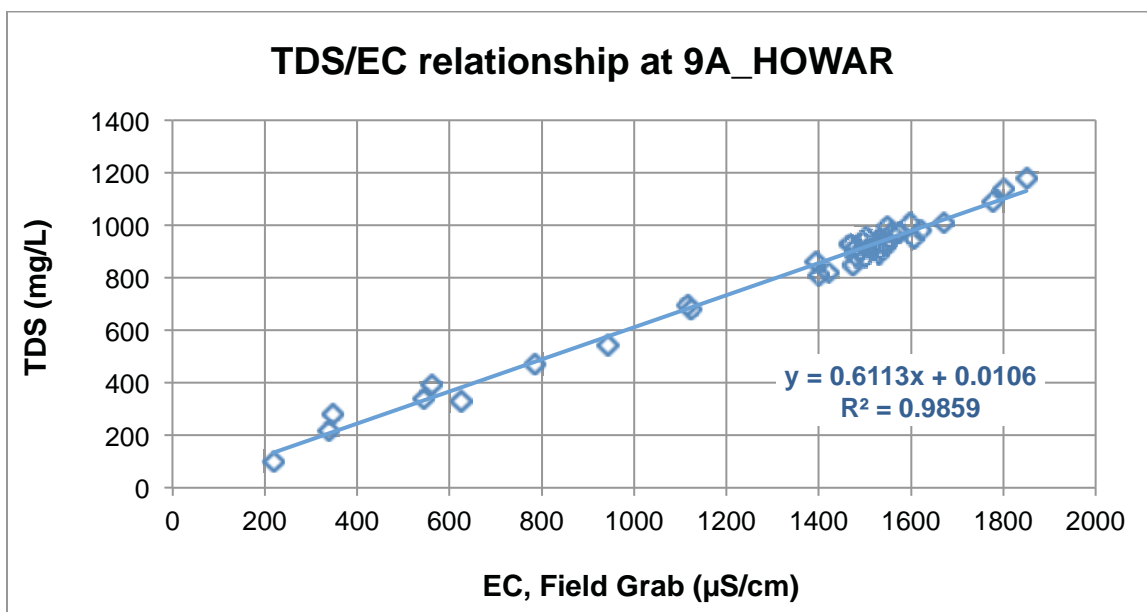
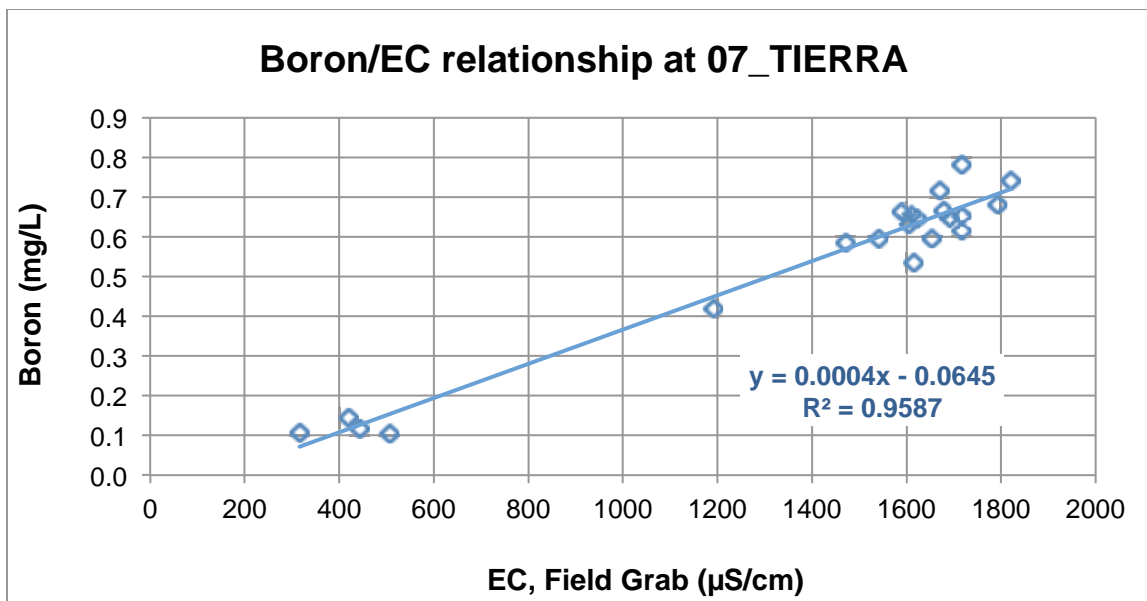


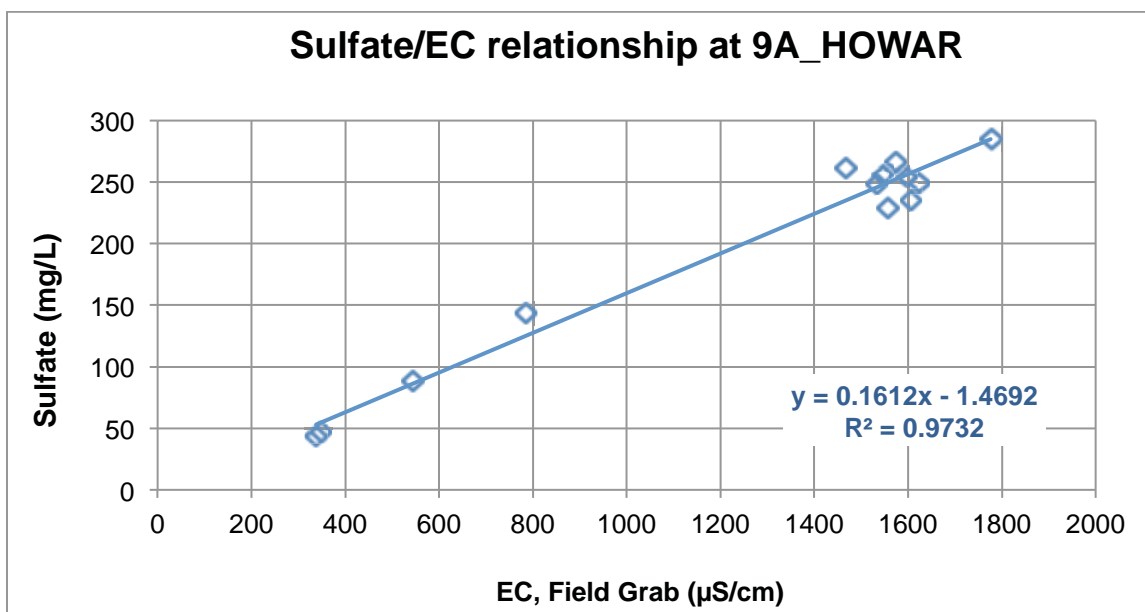
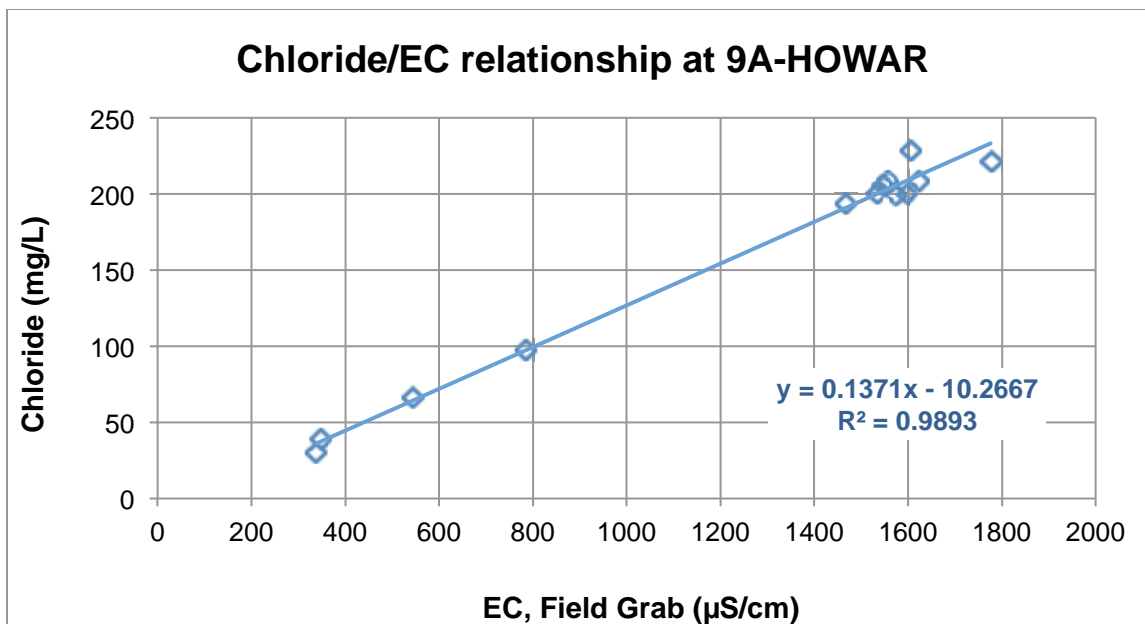
Chloride/EC relationship at 07_TIERRA



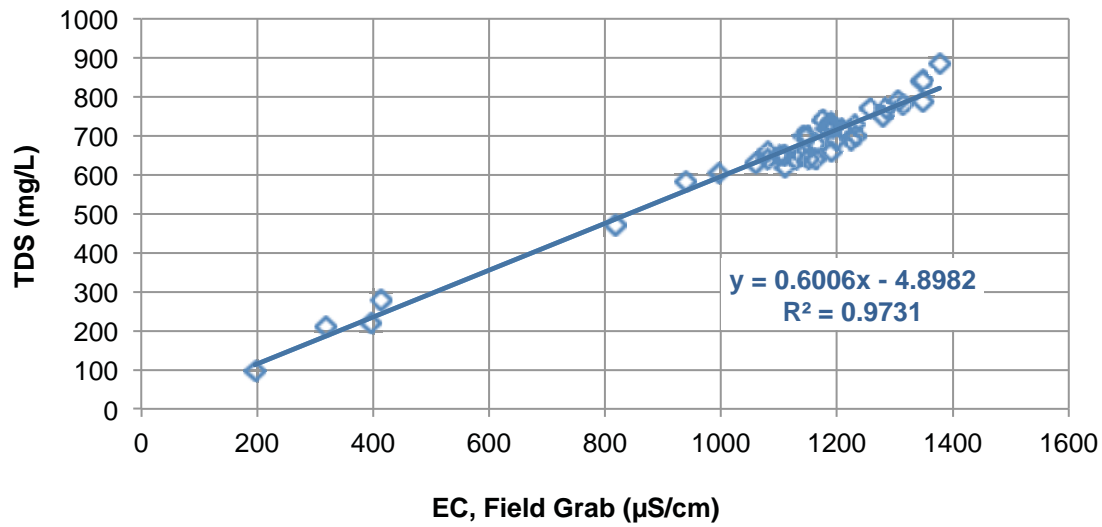
Sulfate/EC relationships at 07_TIERRA



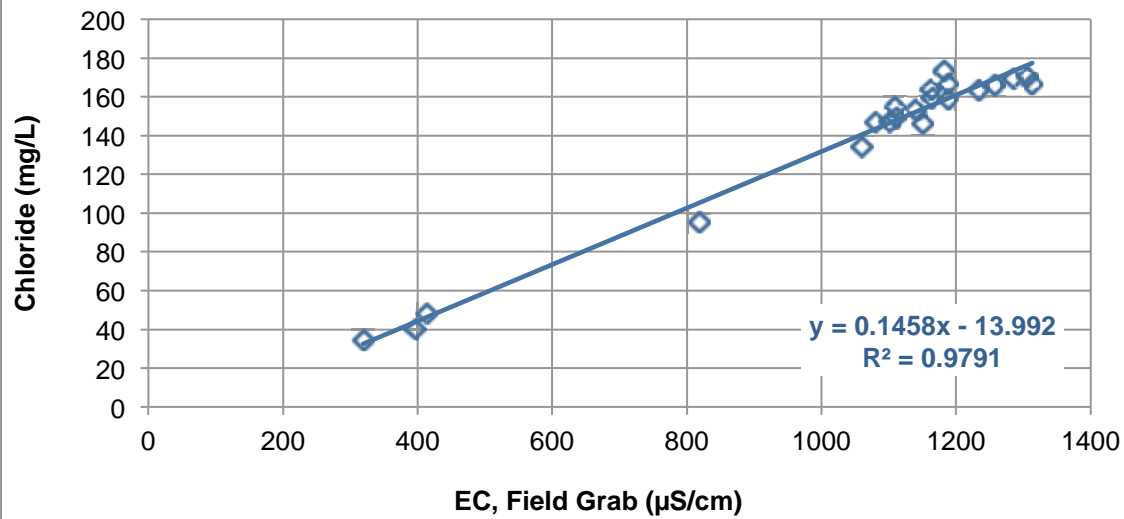


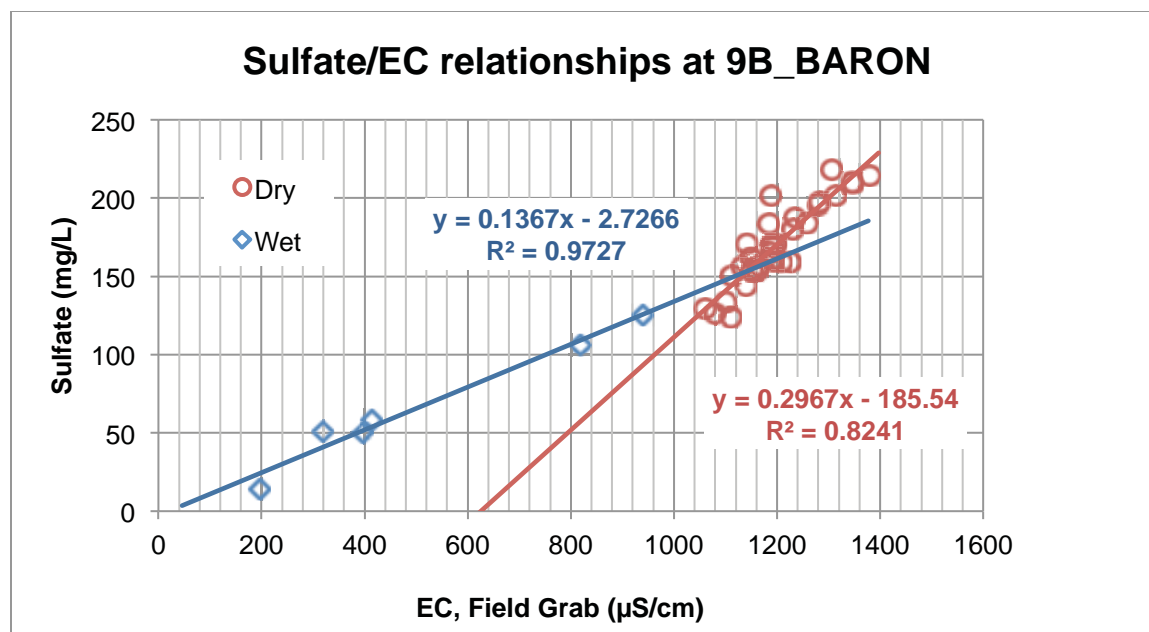


TDS/EC relationship at 9B_BARON



Chloride/EC relationship at 9B_BARON





Appendix D:

Toxicity Testing and Toxicity Identification Evaluations (TIE) Summary

TOXICITY TESTING PROCEDURES

For the Calleguas Creek Watershed Total Maximum Daily Load (TMDL) Compliance Monitoring Program (CCWTMP), toxicity testing at various locations is conducted to meet TMDL requirements. The following is a brief summary of the procedures for the analytical methods used by the CCWTMP. Specific details concerning the standard operating procedures (SOPs) followed by field crews collecting applicable samples and laboratory analyses are found in the Quality Assurance Project Plan (QAPP).

For the CCWTMP toxicity measures, standard test species were utilized for toxicity testing. *Ceriodaphnia dubia* was used for fresh water aquatic toxicity testing and *Hyalella azteca* for the saline water aquatic toxicity testing and bulk sediment and porewater toxicity testing. *Hyalella azteca* was used to conduct aquatic toxicity testing if sample salinity exceeded 1.5 part per thousand (PPT) but was less than 15 PPT. All test species are standard United States Environmental Protection Agency (USEPA) test species and considered the most applicable for the various types of pollutants impacting the watershed, and all analytical testing procedures were conducted using standard USEPA methods.

The results of each toxicity test are used to trigger further investigations to determine the cause of observed laboratory toxicity if necessary per the QAPP. If testing indicates the presence of significant toxicity in the sample, toxicity identification evaluations (TIEs) procedures are initiated to investigate the cause of toxicity. For the purpose of triggering TIE procedures, significant toxicity is defined as at least 50 percent mortality. The 50 percent mortality threshold is consistent with the approach recommended in guidance published by USEPA for conducting TIEs (USEPA, 1996), which recommends a minimum threshold of 50% mortality because the probability of completing a successful TIE decreases rapidly for samples with less than this level of toxicity.¹ A component of the compliance requirement when significant toxicity is found is to initiate a targeted Phase 1 TIE and test to determine the general class of constituent (*i.e.*, non-polar organics) causing toxicity. The targeted TIE focuses on classes of constituents anticipated to be observed in drainages dominated by urban and agricultural discharges and those previously observed to cause toxicity. Phase 2 TIEs may also be utilized to identify specific constituents causing toxicity if warranted. TIE methods will generally adhere to USEPA procedures documented in conducting TIEs.^{2,3,4,5} For samples exhibiting toxic effects consistent with carbofuran, diazinon, or chlorpyrifos, TIE procedures follow those documented in Bailey *et al.*⁶

¹ United States Environmental Protection Agency (USEPA). 1996. Marine Toxicity Identification Evaluation. Phase I Guidance Document EPA/600/R-96/054. USEPA, Office of Research and Development, Washington, D.C.

² United States Environmental Protection Agency (USEPA). 1991. Methods for Aquatic Toxicity Identification Evaluations: Phase 1 Toxicity Characterization Procedures (Second Edition). EPA-600/6-91/003. USEPA, Environmental Research Laboratory, Duluth, MN.

The decision to initiate TIE procedures on any sample, including samples exceeding the mortality threshold, as well as the focus and scope of TIE procedures, is determined by the Project Manager and toxicity laboratory staff. When deciding whether to initiate TIE procedures for a specific site and monitoring event, a number of factors are considered, including the level of toxicity, the magnitude of sample mortality and/or reburial levels as compared to lab control results, history of toxicity at the site, the species and endpoints exhibiting toxic effects, as well as the primary technical basis for triggering TIEs described above. A summary of the toxicity results and subsequent TIE actions, including the rationale for initiating TIE procedures for a specific sample are described below.

TOXICITY RESULTS SUMMARY

Freshwater sediment toxicity samples are collected annually during the first event of each monitoring year. Sediment toxicity samples are collected every three years in Mugu Lagoon. As such, freshwater and lagoon sediment toxicity samples were not collected during this monitoring year. Water column toxicity samples are collected at freshwater sites during each of the quarterly and wet weather events. Monitored sites include the following:

- **Sediment Toxicity (Freshwater Sites)**
 - 02_PCH
 - 03_UNIV
 - 04_WOOD
 - 9A_HOWAR
- **Freshwater Water Column Toxicity**
 - 04_WOOD
 - 03_UNIV
 - 9B_ADOLF
 - 06_SOMIS
 - 07_HITCH
 - 10_GATE (Toxicity Investigation site)

³ United States Environmental Protection Agency (USEPA). 1992. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents Phase 1. EPA/600/6-91/005. USEPA, Office of Research and Development, Washington, D.C.

⁴ United States Environmental Protection Agency (USEPA). 1993a. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition. EPA/600/4-90/027F. USEPA, Office of Research and Development, Washington, D.C.

⁵ United States Environmental Protection Agency (USEPA). 1993b. Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity. EPA/600/R-02/080. USEPA, Office of Research and Development, Washington, D.C.

⁶ Bailey, H.C., DiGiorgio, C., Kroll, K., Miller, J.L., Hinton, D.E., Starrett, G. 1996. Development of Procedures for Identifying Pesticide Toxicity in Ambient Waters: Carbofuran, Diazinon, Chlorpyrifos. Environ. Tox. and Chem. V15, No. 6, 837-845.

- 13_BELT (Toxicity Investigation site)

Toxicity samples for sediment were collected at the freshwater sites during dry weather Event 50. Water column toxicity testing was conducted during all four dry weather events (Events 50, 51, 54, and 55), and the wet weather events (Events 52 and 53). The following section describes the toxicity samples collected at each site for each event, the results of the tests, and a summary of applicable TIEs initiated per the requirements in the QAPP.

Event 50 Sediment Toxicity

Table 1. Freshwater Sediment Toxicity Event 50 - *Hyalella azteca*

Site ID	<i>Hyalella azteca</i>		
	Survival	Growth	TIE?
02_PCH	No	Yes	No
03_UNIV	No	No	No
04_WOOD	Yes ¹	Yes	No
9A_HOWAR	No	Yes	No

1. There was a greater than 50 percent reduction in *Hyalella azteca* survival.

Event 50 Water Column Toxicity

Table 2. Freshwater Water Column Toxicity Event 50 - *Ceriodaphnia dubia* and *Hyalella azteca*

Site ID	<i>Ceriodaphnia dubia</i>			<i>Hyalella azteca</i>	
	Survival	Reproduction	TIE?	Survival	TIE?
03_UNIV	No	No	No		
04_WOOD				No	No
07_HITCH	No	No	No		
9B_ADOLF	No	No	No		
10_GATE	No	No	No		
13_BELT	No	No	No		

Event 50 Toxicity and TIE Summary

- Freshwater sediment sites exhibited significant mortality at the 04_WOOD site >50 percent, but a TIE was not performed. Toxicity was frequently identified at the 04_WOOD site during the first two monitoring years in water column samples and in each of the four sediment samples. The Stakeholders have chosen to invest resources into source control efforts to address sources potentially contributing to the toxicity issue, rather than conduct TIEs in the event of significant mortality.
- There were no significant reductions in survival or reproduction of *Ceriodaphnia dubia* in any of the Calleguas Creek ambient waters.
- There were no significant reductions in survival of *Hyalella Azteca* in any of the Calleguas Creek ambient waters.
- No TIEs were performed on samples collected for this sampling event.

Event 51 Water Quality Toxicity

Table 3. Water Quality Toxicity Event 51 - *Ceriodaphnia dubia* and *Hyalella azteca*

Site ID	<i>Ceriodaphnia dubia</i>			<i>Hyalella azteca</i>	
	Survival	Reproduction	TIE?	Survival	TIE?
03_UNIV	No	No	No		
04_WOOD				No	No
06_SOMIS	No	No	No		
07_HITCH	No	No	No		
9B_ADOLF	No	Yes	No		
10_GATE	No	Yes	No		

Event 51 Toxicity and TIE Summary

- No significant reductions in survival were observed for *Ceriodaphnia dubia* at the five freshwater sample sites during the sampling event.
- Significant reductions in reproduction were observed for *Ceriodaphnia dubia* at 9B_ADOLF and 10_GATE.
- No significant reduction in survival was observed for *Hyalella azteca* at the 04_WOOD site.
- No TIEs were performed on samples collected for this sampling event.

Event 52 Water Quality Toxicity

Table 4. Water Quality Toxicity Event 52 - *Ceriodaphnia dubia*

Site ID	<i>Ceriodaphnia dubia</i>		
	Survival	Reproduction	TIE?
03_UNIV	No	Yes	No
04_WOOD	Yes	Yes	No
07_HITCH	No ¹	Yes	No
9B_ADOLF	No	Yes	No
10_GATE	No	Yes	No
13_BELT	No ¹	Yes	No

1 – The survival response at the Lab Control treatment for this test did not meet test acceptability criteria (i.e., there was <80% survival); however, as there was 100% survival in the 100% ambient water treatment, it can be concluded that this sample was not toxic to *Ceriodaphnia* survival.

Event 52 Toxicity and TIE Summary

- Significant mortality was observed for *Ceriodaphnia dubia* at 04_WOOD >50 percent, but a TIE was not performed. Toxicity was frequently identified at the 04_WOOD site during the first two monitoring years in water column samples and in each of the four sediment samples. The Stakeholders have chosen to invest resources into source control efforts to address sources potentially contributing to the toxicity issue, rather than conduct TIEs in the event of significant mortality.
- There were significant reductions in reproduction observed for *Ceriodaphnia dubia* at all sites tested.
- No TIEs were performed on samples collected for this sampling event.

Event 53 Water Quality Toxicity

Table 5. Water Quality Toxicity Event 53 - *Ceriodaphnia dubia*

Site ID	<i>Ceriodaphnia dubia</i>		
	Survival	Reproduction	TIE?
03_UNIV	No	No	No
04_WOOD	Yes	No	No
07_HITCH	No	No	No
9B_ADOLF	No	No	No
10_GATE	No	No	No
13_BELT	No	No	No

Event 53 Toxicity and TIE Summary

- Significant reductions in survival were observed for *Ceriodaphnia dubia* at the 04_WOOD site >50 percent, but a TIE was not performed. Toxicity was frequently identified at the 04_WOOD site during the first two monitoring years in water column samples and in each of the four sediment samples. The Stakeholders have chosen to invest resources into source control efforts to address sources potentially contributing to the toxicity issue, rather than conduct TIEs in the event of significant mortality.
- No significant reductions in reproduction were observed.
- No TIEs were performed on samples collected for this sampling event.

Event 54 Water Quality Toxicity

Table 6. Water Quality Toxicity Event 54 - *Ceriodaphnia dubia* and *Hyalella azteca*

Site ID	<i>Ceriodaphnia dubia</i>			<i>Hyalella azteca</i>	
	Survival	Reproduction	TIE?	Survival	TIE?
03_UNIV	No	No	No		
04_WOOD				No	No
07_HITCH	No	No	No		
9B_ADOLF	No	Yes	No		
10_GATE	No	No	No		
13_BELT	No	Yes	No		

Event 54 Toxicity and TIE Summary

- No significant reductions in survival were observed for *Ceriodaphnia dubia* or *Hyalella azteca* for all sites.
- Significant reproduction toxicity for *Ceriodaphnia dubia* was observed at the 9B_ADOLF and 13_BELT sites.
- No TIEs were performed on samples collected for this sampling event.

Event 55 Water Quality Toxicity

Table 7. Water Quality Toxicity Event 55 - *Ceriodaphnia dubia* and *Hyalella azteca*

Site ID	<i>Ceriodaphnia dubia</i>			<i>Hyalella azteca</i>	
	Survival	Reproduction	TIE?	Survival	TIE?
03_UNIV	No	No	No		
04_WOOD				No	No
07_HITCH	No	No	No		
9B_ADOLF	No	No	No		
10_GATE	No	Yes	No		
13_BELT	No	No	No		

Event 55 Toxicity and TIE Summary

- No significant reductions in survival were observed for *Ceriodaphnia dubia* or *Hyalella azteca*.
- Significant reproduction toxicity for *Ceriodaphnia dubia* was observed at the 10_GATE site.
- No TIEs were performed on samples collected for this sampling event.

Appendix E:

Laboratory QA/QC Results and Discussion

QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance and quality control (QA/QC) measures are built into the Calleguas Creek Watershed Total Maximum Daily Load (TMDL) Compliance Monitoring Program (CCWTMP) to assure that collected data are credible. Two types of quality controls were conducted. Field quality controls (to test for field contamination and precision) were conducted by the field crews and include: equipment blanks, field blanks, and field duplicates. Laboratory quality controls (to test for laboratory contamination and precision) were conducted by the laboratories and include: method blanks, blank spikes, blank spike duplicates, lab duplicates, matrix spikes, matrix spike duplicates, laboratory control samples, and surrogates (organics only). Equipment blanks only apply to the shovels used in sediment sample collection. All field protocols for the collection of clean samples were followed according to the Quality Assurance Project Plan (QAPP). The following section lists the quality control failures that occurred during the 2015-2016 monitoring year and any associated qualifiers and comments.

Blank Contamination

Blank samples are used to identify the presents of and potential sources of sample contamination. During the eighth year of monitoring, there were three types of blank samples conducted.

- **Field blanks** are conducted by field crews and are looking for possible contamination in the collection and transportation of samples.
- **Equipment blanks** are done by the field crews and are look for contamination with the sampling equipment.
- **Laboratory blanks** are conducted by the analyzing laboratory and look for contamination in the lab.

Of the blank failures about half were in the laboratory blanks, while the other half were in the field blanks. Of the field blanks, a majority were in the metals category. There were no equipment blank failures. Of the lab blank failures, they were equal split between general water and metals. Even though the detections were above the method detection limit (MDL) value, most were low compared to the environmental sample, so very few qualifications were needed. Details of all the blank hits are reported in **Table 1** below. The following lists a basic summary of the blank contamination results:

- Field Blanks – 1838 analyzed – 10 detections above the MDL (0.54%) (does not include surrogates)
- Equipment Blanks – 129 analyzed – 0 detections above MDL (0.0%) (does not include lab duplicates or surrogates)
- Laboratory Blanks – 3690 analyzed – 11 detections above MDL (0.30%) (does not include surrogates)

Precision

Precision (reproducibility) of sample collection, preparation, and analytical methods is demonstrated by analyzing duplicate samples and calculating the relative percent difference (RPD) between the original and duplicate samples. The RPD is reported for field duplicates, lab duplicates, blank spike duplicates, laboratory control spike (LCS) duplicates, and matrix spike duplicates. An RPD is computed as:

$$RPD = 2 * |O_i - D_i| / (O_i + D_i) * 100$$

Where:

RPD = Relative Percent Difference

O_i = value of compound i in original sample

D_i = value of compound i in duplicate sample

QA failures for precision are noted when the RPD between a sample and its duplicate are greater than the acceptance value. Details of all the RPD failures are reported in **Table 2** below. The following list summarizes the precision analysis results:

- Field Duplicates – 1988 analyzed – 102 failed RPD (5.13%) (does not include surrogates)
- Laboratory Duplicates – 1089 analyzed – 1 failed RPD (0.09%) (includes surrogates)
- Blank Spike/LCS Duplicates – 3264 analyzed – 9 failed RPD (0.28%) (includes surrogates)
- Matrix Spike Duplicates – 1011 analyzed – 34 failed RPD (3.36%) (includes surrogates)

Accuracy

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

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

Where:

%R = Percent Recovery

C_s = analyzed spiked concentration

C = analyzed concentration of sample matrix

S = known spiked concentration

Percent recoveries of blank spike samples, LCS samples, and matrix spike samples check the accuracy of lab reported sample concentrations. For the blank spike samples and LCS samples that fell outside the acceptable range, eight of the ten were for pesticides constituents, and all were in water samples. The other two were for metals. For the matrix spike samples that fell outside the acceptable range, a little more than half of them were for metals while the others were for pesticides. **Table 3** summarizes the QA/QC sample results for accuracy that did not meet percent recovery objectives. The following lists the results of the accuracy analysis results:

- Blank Spike/LCS Samples – 6504 Analyzed – 10 fell outside the range (0.15%) (does not include surrogates)
- Matrix Spike Samples – 1966 Analyzed – 141 fell outside the range (7.17%) (does not include surrogates)

Table 1. Blank Contamination Observed

Constituent	Matrix	Event	Lab Batch	Equip Blank	Field Blank	Lab Blank	Program Qualifier	Comments
General Water Quality								
Electrical Conductivity (umhos/cm)	Water	55	2P1605166-B			0.07		
Electrical Conductivity (umhos/cm)	Water	55	2P1605735-A			0.09		
Total Dissolved Solids (mg/L)	Water	53	2P1601389-B			11.18		
Total Dissolved Solids (mg/L)	Water	54	2P1602300-A			9.23		
Total Dissolved Solids (mg/L)	Water	55	2P1605184-A			8		
Nutrients								
Total Kjeldahl Nitrogen (mg/L)	Water	55	Associated_QC11 6 6584_W_CON		0.13		U	Upper Limit due to analyte found in field blank
Total Kjeldahl Nitrogen (mg/L)	Water	55	Associated_QC116 6584_W_CON		0.14		U	Upper Limit due to analyte found in field blank
OC Pesticieds								
None								
PCBs								
None								
OP Pesticides								
Dimethoate (µg/L)	Water	50	W5H0735			0.0073		
Fensulfothion (µg/L)	Water	50	W5H0735			0.0042		
Pyrethroid Pesticides								
None								
Metals & Selenium								
Barium, Dissolved (µg/L)	Water	50	Physis E-8119 W		0.35			
Boron, Total (µg/L)	Water	50	E-8128		24			

Constituent	Matrix	Event	Lab Batch	Equip Blank	Field Blank	Lab Blank	Program Qualifier	Comments
Mercury, Dissolved (µg/L)	Water	54	W6B0614			0.009		
Molybdenum, Dissolved (µg/L)	Water	50	Physis E-8119 W		0.22			
Molybdenum, Total (µg/L)	Water	50	Physis E-8119 W		0.12			
Nickel, Dissolved (µg/L)	Water	50	Physis E-8119 W		0.05			
Nickel, Dissolved (µg/L)	Water	54	W6B1368			0.058		
Strontium, Dissolved (µg/L)	Water	50	Physis E-8119 W		0.03		MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Titanium, Dissolved (µg/L)	Water	50	Physis E-8119 W		0.18		MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Zinc, Dissolved (µg/L)	Water	50	Physis E-8119 W		0.05		FD RPD	FieldDup RPD Failed
Zinc, Dissolved (µg/L)	Water	51	W5K0839			2.44		
Zinc, Dissolved (µg/L)	Water	54	W6B1368			1.78		

Table 2. Precision QA/QC Issues

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
General Water Quality										
Dissolved Organic Carbon (mg/L)	Water	51	Associated_QC 1159787	01_RR_BR				49	EST MS/MSD	Estimate due to MS/MSD RPD failed
Total Organic Carbon (% Dry Weight)	sediment	50	GC-03-042	03_UNIV		70			FD RPD	FieldDup RPD Failed
Total Suspended Solids (mg/L)	Water	52	Physis C-17144 W	10_GATE		74			FD RPD	FieldDup RPD Failed
Nutrients										
Total Kjeldahl Nitrogen (mg/L)	Water	51	Associated_QC 1159909_W_C ON	03_UNIV		86			FD RPD	FieldDup RPD Failed
OC Pesticides										
Chlordane, alpha- (ng/wet g)	Tissue	55	Physis O-10112 W	07_TIERRA		67		9		
Chlordane, alpha-, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		44			FD RPD	FieldDup RPD Failed
Chlordane, gamma- (ng/wet g)	Tissue	55	Physis O-10084 W	04_WOOD		34		23		
Chlordane, gamma-, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		43			FD RPD	FieldDup RPD Failed
Chlordane, gamma-, Total (µg/L)	Water	52	Physis O-9032 W	10_GATE		59			FD RPD	FieldDup RPD Failed
DDD(o,p')	Tissue	55	Physis O-10084	04_WOOD		39		5		

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
(ng/wet g)			W							
DDD(o,p'), Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		32			FD RPD	FieldDup RPD Failed
DDD(o,p'), Total (µg/L)	Water	54	Physis O-9116 W	04_WOOD		36				
DDD(p,p'), Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		42			FD RPD	FieldDup RPD Failed
DDD(p,p'), Total (µg/L)	Water	52	Physis O-9032 W	10_GATE		135			FD RPD	FieldDup RPD Failed
DDE(o,p') (ng/wet g)	Tissue	55	Physis O-10084 W	04_WOOD		33		10		
DDE(p,p') (ng/wet g)	Tissue	55	Physis O-10084 W	04_WOOD		12		251	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
DDE(p,p') (ng/wet g)	Tissue	55	Physis O-10086 W	9B_ADOLF				117	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
DDE(p,p'), Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		50			FD RPD	FieldDup RPD Failed
DDE(p,p'), Total (µg/L)	Water	53	Physis O-9102 W	10_GATE		34				
DDE(p,p'), Total (µg/L)	Water	54	Physis O-9116 W	03_UNIV		67				
DDT(o,p'), Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		49			FD RPD	FieldDup RPD Failed
DDT(p,p'), Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		46			FD RPD	FieldDup RPD Failed
Dieldrin, Total (µg/L)	Water	52	Physis O-9032 W	10_GATE		126				

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
Endrin Aldehyde, Total (µg/L)	Water	50	Physis O-8042 W	LABQA	31				EST BS/BSD	Estimate due to BS/BSD RPD failed
Nonachlor, cis, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		61				
Nonachlor, trans, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		42			FD RPD	FieldDup RPD Failed
Permethrin, cis-, Total (µg/L)	Water	50	Physis O-8042 W	LABQA	90				BS <LL, EST BS/BSD	BS failed lower limit, Estimate due to BS/BSD RPD failed
Permethrin, trans-, Total (µg/L)	Water	50	Physis O-8042 W	LABQA	45				EST BS/BSD	Estimate due to BS/BSD RPD failed
Permethrin, trans-, Total (µg/L)	Water	55	Physis O-10068 W	LABQA	37				EST BS/BSD	Estimate due to BS/BSD RPD failed
Permethrin, trans-, Total (µg/L)	Water	55	Physis O-10070 W	LABQA	35				EST BS/BSD	Estimate due to BS/BSD RPD failed
Tetrachloro-m-xylene-2,4,5,6 (Surrogate), Total (%)	Water	52	Physis O-9032 W	01T_ODD2_DC H		54				
Tetrachloro-m-xylene-2,4,5,6 (Surrogate), Total (%)	Water	52	Physis O-9032 W	10_GATE		62				
Tetrachloro-m-xylene-2,4,5,6 (Surrogate), Total (%)	Water	53	Physis O-9102 W	10_GATE		54				
Tetrachloro-m-xylene-2,4,5,6	Water	55	Physis O-10068 W	07_HITCH		111				

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
(Surrogate), Total (%)										
PCBs										
PCB 030 (Surrogate) (%)	Tissue	55	Physis O-10084 W	04_WOOD		32		19	LD RPD	LabDuplicate RPD Failed
PCB 030 (Surrogate), Total (%)	Water	52	Physis O-9032 W	01T_ODD2_DC H		53			FD RPD	FieldDup RPD Failed
PCB 030 (Surrogate), Total (%)	Water	52	Physis O-9032 W	10_GATE		69			FD RPD	FieldDup RPD Failed
PCB 030 (Surrogate), Total (%)	Water	53	Physis O-9102 W	10_GATE		44				
PCB 030 (Surrogate), Total (%)	Water	55	Physis O-10068 W	07_HITCH		94			FD RPD	FieldDup RPD Failed
PCB 037 (ng/wet g)	Tissue	55	Physis O-10112 W	07_TIERRA		0		40	EST MS/MSD	Estimate due to MS/MSD RPD failed
PCB 095, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		43				
PCB 101, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		40				
PCB 105 (ng/wet g)	Tissue	55	Physis O-10084 W	04_WOOD		46		11	LD RPD	LabDuplicate RPD Failed
PCB 110, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		42				
PCB 112 (Surrogate), Total (%)	Water	52	Physis O-9032 W	01T_ODD2_DC H		38			FD RPD	FieldDup RPD Failed
PCB 112	Water	52	Physis O-9032	10_GATE		55			FD RPD	FieldDup RPD Failed

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
(Surrogate), Total (%)			W							
PCB 112 (Surrogate), Total (%)	Water	55	Physis O-10068 W	07_HITCH		82			FD RPD	FieldDup RPD Failed
PCB 118 (ng/wet g)	Water	55	Physis O-10086 W	LABQA	31				EST BS/BSD	Estimate due to BS/BSD RPD failed
PCB 128 (ng/wet g)	Tissue	55	Physis O-10086 W	9B_ADOLF		10		40	EST MS/MSD	Estimate due to MS/MSD RPD failed
PCB 151 (ng/wet g)	Tissue	55	Physis O-10086 W	9B_ADOLF		40		7		
PCB 153 (ng/wet g)	Tissue	55	Physis O-10112 W	07_TIERRA		57		7		
PCB 187 (ng/wet g)	Tissue	55	Physis O-10086 W	9B_ADOLF		22		32	EST MS/MSD	Estimate due to MS/MSD RPD failed
PCB 198 (Surrogate) (%)	Tissue	55	Physis O-10112 W	07_TIERRA		59		20		
PCB 198 (Surrogate), Total (%)	Water	52	Physis O-9032 W	01T_ODD2_DC H		35			FD RPD	FieldDup RPD Failed
PCB 198 (Surrogate), Total (%)	Water	52	Physis O-9032 W	10_GATE		54			FD RPD	FieldDup RPD Failed
PCB 198 (Surrogate), Total (%)	Water	55	Physis O-10068 W	07_HITCH		90			FD RPD	FieldDup RPD Failed
PCB 206 (ng/wet g)	Tissue	55	Physis O-10112 W	07_TIERRA		0		104	EST MS/MSD	Estimate due to MS/MSD RPD failed
PCB 209 (ng/wet g)	Tissue	55	Physis O-10086 W	9B_ADOLF		0		41	EST MS/MSD	Estimate due to MS/MSD RPD failed
OP Pesticides										

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
Azinphos methyl (Guthion) (µg/L)	Water	54	W6B0505	10D_HILL				37		
Azinphos methyl (Guthion) (µg/L)	Water	55	W6E0400	10D_HILL				35		
Bolstar (µg/L)	Water	54	W6B0505	10D_HILL				71		
Chlorpyrifos (ng/dry g)	Sediment	50	Physis O-8038 W	03_UNIV		32				
Chlorpyrifos, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		43			FD RPD	FieldDup RPD Failed
Chlorpyrifos, Total (µg/L)	Water	55	Physis O-10068 W	01T_ODD2_DC H		73			FD RPD	FieldDup RPD Failed
Coumaphos (µg/L)	Water	54	W6B0505	10D_HILL				35		
Coumaphos (µg/L)	Water	55	W6E0400	10D_HILL				42		
Demeton-o (µg/L)	Water	54	W6B0505	10D_HILL				154		
Demeton-s, Total (µg/L)	Water	50	Physis O-8030 W	LABQA	48				EST BS/BSD	Estimate due to BS/BSD RPD failed
Diazinon (µg/L)	Water	54	W6B0505	10D_HILL				124		
Diazinon (µg/L)	Water	55	W6E0400	10D_HILL				31		
Diazinon, Total (µg/L)	Water	50	Physis O-8042 W	LABQA	32				EST BS/BSD	Estimate due to BS/BSD RPD failed
Disulfoton, Total (µg/L)	Water	50	Physis O-8030 W	LABQA	50				EST BS/BSD	Estimate due to BS/BSD RPD failed
Fensulfothion (µg/L)	Water	54	W6B0505	10D_HILL				33		
Malathion, Total (µg/L)	Water	52	Physis O-9032 W	10_GATE		189			FD RPD	FieldDup RPD Failed
Malathion, Total	Water	53	Physis O-9094	03_UNIV		76			FD RPD	FieldDup RPD Failed

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
(µg/L)			W							
Merphos (µg/L)	Water	54	W6B0505	10D_HILL				54		
Mevinphos (µg/L)	Water	51	W5K0614	10D_HILL				31	EST MS/MSD	Estimate due to MS/MSD RPD failed
Tokuthion (Prothiofos) (µg/L)	Water	54	W6B0505	10D_HILL				41		
PAHs										
None										
Pyrethroid Pesticides										
Bifenthrin (ng/dry g)	Sediment	50	Physis O-8038 W	03_UNIV		46				
Bifenthrin, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		87			FD RPD	FieldDup RPD Failed
Bifenthrin, Total (µg/L)	Water	52	Physis O-9032 W	10_GATE		32			FD RPD	FieldDup RPD Failed
Cyfluthrin, total, Total (µg/L)	Water	52	Physis O-9032 W	10_GATE		75			FD RPD	FieldDup RPD Failed
Cypermethrin, total, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		123			FD RPD	FieldDup RPD Failed
Danitol, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		91			FD RPD	FieldDup RPD Failed
Deltamethrin/Tral omethrin (µg/L)	Water	54	W6B0466	10D_HILL			77			
Esfenvalerate, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		157			FD RPD	FieldDup RPD Failed
Fenvalerate, Total (µg/L)	Water	52	Physis O-9032 W	01T_ODD2_DC H		131				
L-Cyhalothrin	Water	50	W5H0425	LABQA				37		

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
(µg/L)										
Metals and Selenium										
Aluminum, Dissolved (µg/L)	Water	50	Physis E-8119 W	04_WOOD		31				
Aluminum, Dissolved (µg/L)	Water	51	Physis E-10023 W	02_PCH		43			MS >UL	MS failed upper limit
Aluminum, Dissolved (µg/L)	Water	53	Physis E-10089 W	01T_ODD2_DC H		42			LD RPD	LabDuplicate RPD Failed
Aluminum, Total (µg/L)	Water	52	Physis E-10054 W	01_RR_BR		2		37	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Aluminum, Total (µg/L)	Water	53	Physis E-10089 W	03_UNIV		31			FD RPD	FieldDup RPD Failed
Antimony, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		42		7		
Barium, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		35		4	FD RPD	FieldDup RPD Failed
Beryllium, Dissolved (µg/L)	Water	54	Physis E-10090 W	9AD_CAMA		120		3		
Beryllium, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		133		2		
Beryllium, Total (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		120		1		
Cadmium, Dissolved (µg/L)	Water	51	Physis E-10024 W	05D_SANT_VC WPD		75		1		
Cadmium, Dissolved (µg/L)	Water	55	Physis E-10147 W	9AD_CAMA		57		4		
Cadmium, Total (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		33		2	LD RPD	LabDuplicate RPD Failed
Cadmium, Total	Water	55	Physis E-10147	9AD_CAMA		112		0	LD RPD	LabDuplicate RPD Failed

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
(µg/L)			W							
Chromium, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		51		2	LD RPD, FD RPD	LabDuplicate RPD Failed, FieldDuplicate RPD Failed
Chromium, Dissolved (µg/L)	Water	55	Physis E-10147 W	9AD_CAMA		54		3	LD RPD, FD RPD	LabDuplicate RPD Failed, FieldDuplicate RPD Failed
Chromium, Total (µg/L)	Water	53	Physis E-10089 W	03_UNIV		32			FD RPD	FieldDup RPD Failed
Cobalt, Dissolved (µg/L)	Water	53	Physis E-10089 W	01T_ODD2_DC H		91			LD RPD	LabDuplicate RPD Failed
Iron, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H				158	MS >UL, EST MS/MSD	MS failed upper limit, Estimate due to RPD failure between MS/MSD
Iron, Total (µg/L)	Water	53	Physis E-10089 W	03_UNIV		41			FD RPD	FieldDup RPD Failed
Iron, Total (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H				52	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Lead, Dissolved (µg/L)	Water	50	Physis E-8119 W	01T_ODD2_DC H		41		1	LD RPD	LabDuplicate RPD Failed
Lead, Dissolved (µg/L)	Water	51	Physis E-10023 W	02_PCH		143		0	LD RPD, FD RPD	LabDuplicate RPD Failed, FieldDuplicate RPD Failed
Lead, Dissolved (µg/L)	Water	51	Physis E-10023 W	03_UNIV		88			LD RPD, FD RPD	LabDuplicate RPD Failed, FieldDuplicate RPD Failed
Lead, Dissolved (µg/L)	Water	52	Physis E-10053 W	01T_ODD2_DC H		40			FD RPD	FieldDup RPD Failed
Lead, Dissolved (µg/L)	Water	53	Physis E-10089 W	01T_ODD2_DC H		80			LD RPD	LabDuplicate RPD Failed
Lead, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		32		3	LD RPD, FD RPD	LabDuplicate RPD Failed, FieldDuplicate RPD Failed
Lead, Dissolved	Water	55	Physis E-10147	9AD_CAMA		56		0	LD RPD,	LabDuplicate RPD Failed,

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
(µg/L)			W						FD RPD	FieldDuplicate RPD Failed
Lead, Total (µg/L)	Water	55	Physis E-10147 W	9AD_CAMA		57		1	LD RPD	LabDuplicate RPD Failed
Manganese, Total (µg/L)	Water	52	Physis E-10054 W	01_RR_BR		2		43	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Mercury, Dissolved (µg/L)	Water	54	Physis E-9104 W	07D_SIMI		67			LD RPD	LabDuplicate RPD Failed
Mercury, Total (µg/L)	Water	51	Physis E-9037 W	03_UNIV		46				
Mercury, Total (µg/L)	Water	54	Physis E-9116 W	03_UNIV		80			FD RPD	FieldDup RPD Failed
Selenium, Dissolved (µg/L)	Water	53	Physis E-10089 W	03_UNIV		34			FD RPD	FieldDup RPD Failed
Selenium, Dissolved (µg/L)	Water	55	Physis E-10147 W	9AD_CAMA		68		4	LD RPD	LabDuplicate RPD Failed
Selenium, Total (µg/L)	Water	54	Physis E-10110 W	01_RR_BR		33			LD RPD, FD RPD	LabDuplicate RPD Failed, FieldDuplicate RPD Failed
Selenium, Total (µg/L)	Water	54	Physis E-10111 W	03_UNIV		46			FD RPD	FieldDup RPD Failed
Selenium, Total (µg/L)	Water	55	Physis E-10147 W	9AD_CAMA		171		4	LD RPD	LabDuplicate RPD Failed
Strontium, Dissolved (µg/L)	Water	50	Physis E-8119 W	01T_ODD2_DC H		1		32	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Strontium, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		7		73	MS >UL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Strontium, Total (µg/L)	Water	52	Physis E-10054 W	01_RR_BR		2		75	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
Strontium, Total (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		1		2644	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Thallium, Dissolved (µg/L)	Water	50	Physis E-8119 W	07D_SIMI		86		0		
Thallium, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		40		2		
Thallium, Total (µg/L)	Water	53	Physis E-10089 W	03_UNIV		67				
Thallium, Total (µg/L)	Water	55	Physis E-10144 W	01_RR_BR		35				
Thallium, Total (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		67		1		
Tin, Dissolved (µg/L)	Water	50	Physis E-8119 W	04_WOOD		59				
Tin, Total (µg/L)	Water	50	Physis E-8119 W	01T_ODD2_DC H		80		2		
Tin, Total (µg/L)	Water	50	Physis E-8124 W	01_RR_BR		40			LD RPD	LabDuplicate RPD Failed
Tin, Total (µg/L)	Water	55	Physis E-10147 W	9AD_CAMA		75		4		
Titanium, Dissolved (µg/L)	Water	50	Physis E-8119 W	01T_ODD2_DC H		2		171	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Titanium, Dissolved (µg/L)	Water	55	Physis E-10147 W	01T_ODD2_DC H		8		31	MS >UL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Titanium, Total (µg/L)	Water	50	Physis E-8119 W	01T_ODD2_DC H		1		67	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Titanium, Total	Water	55	Physis E-10147	01T_ODD2_DC		1		43	MS <LL,	MS failed lower limit,

Constituent	Matrix	Event	Lab Batch	Site	BS/ BSD RPD	Field Dup RPD	Lab Dup RPD	MS/ MSD RPD	Program Qualifier	Comments
(µg/L)			W	H					EST MS/MSD	Estimate due to RPD failure between MS/MSD
Zinc, Dissolved (µg/L)	Water	50	Physis E-8119 W	04_WOOD		60			FD RPD	FieldDup RPD Failed
Zinc, Dissolved (µg/L)	Water	51	Physis E-10024 W	05D_SANT_VC WPD		33		1		
Zinc, Total (µg/L)	Water	52	Physis E-10054 W	01_RR_BR		2		58	MS <LL, MS >UL, EST MS/MSD	MS failed lower limit, MS failed upper limit, Estimate due to RPD failure between MS/MSD

EST BS/BSD = Estimated due to Blank Spike/Blank Spike Duplicate RPD failure.

EST MS/MSD = Estimated due to Matrix Spike/Matrix Spike Duplicate RPD failure

FD RPD = Field Duplicate Relative Percent Difference failure

LD RPD = Lab Duplicate Relative Percent Difference failure

MS <LL = Matrix spike recovery was below the Lower Limit of the acceptance range

MS >UL = Matrix spike recovery was above the Upper Limit of the acceptance range

Table 3. Accuracy QA/QC Issues

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
General Water Quality											
Dissolved Organic Carbon (mg/L)	Water	51	Associated_QC1 159787	80	120	96		117	71	EST MS/MSD	Estimate due to RPD failure between MS/MSD
Nutrients											
Ammonia as N (mg/L)	Water	51	Physis C-18107 W	75	121			64	64	MS <LL	MS failed lower limit
Nitrate as N (mg/L)	Water	51	Physis C-23130 W	91	122			88	86	MS <LL	MS failed lower limit
Nitrate as N (mg/L)	Water	53	Physis C-26020 W	76	121			127	126	MS >UL	MS failed upper limit
Nitrite as N (mg/L)	Water	51	Physis C-24150 W	81	112			48	46	MS <LL	MS failed lower limit
Nitrite as N (mg/L)	Water	55	Physis C-28057 W	70	130			60	60	MS <LL	MS failed lower limit
OC Pesticides											
DDE(p,p') (ng/wet g)	Tissue	55	Physis O-10084 W	44	148			16	-14	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
DDE(p,p') (ng/wet g)	Tissue	55	Physis O-10086 W	44	148			149	39	MS <LL, MS >UL, EST MS/MSD	MS failed lower limit, MS failed upper limit, Estimate due to RPD failure between MS/MSD
Methoxychlor (ng/wet g)	Tissue	55	Physis O-10112 W	54	166			47	51	MS <LL	MS failed lower limit
Oxychlordan (ng/wet g)	Tissue	55	Physis O-10084 W	43	156			623	636	MS >UL	MS failed upper limit

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
Toxaphene (ng/wet g)	Tissue	55	Physis O-10112 W	51	174			44	37	MS <LL	MS failed lower limit
PCBs											
PCB 018 (ng/wet g)	Tissue	55	Physis O-10112 W	59	136			321	358	MS >UL	MS failed upper limit
PCB 128 (ng/wet g)	Tissue	55	Physis O-10084 W	53	158			45		MS <LL	MS failed lower limit
PCB 170 (ng/wet g)	Tissue	55	Physis O-10112 W	47	160			38	34	MS <LL	MS failed lower limit
OP Pesticides											
Azinphos methyl (Guthion) (µg/L)	Water	55	W6E0400	0.1	154			135	193	MS >UL	MS failed upper limit
Bolstar, Total (µg/L)	Water	55	Physis O-10070 W	46	147	131	155			BS >UL	BS failed upper limit
Demeton-s (µg/L)	Water	51	W5K0614	0.1	213	270		324	321	BS >UL, MS >UL	BS failed upper limit, MS failed upper limit
Demeton-s (µg/L)	Water	50	W5H0735	0.1	207			187	208	MS >UL	MS failed upper limit
Diazinon (µg/L)	Water	54	W6B0505	36	153			135	31	MS <LL	MS failed lower limit
Disulfoton (ng/dry g)	Water	50	Physis O-8038 W	25	125	22	26			BS <LL	BS failed lower limit
Ethoprop (µg/L)	Water	50	W5H0735	51	167			177	176	MS >UL	MS failed upper limit
Malathion (µg/L)	Water	50	W5H0735	6	184			165	185	MS >UL	MS failed upper limit
Stirophos (µg/L)	Water	50	W5H0735	0.1	167			197	197	MS >UL	MS failed upper limit
Tokuthion (Prothiofos) (µg/L)	Water	55	W6E0400	27	160			183	238	MS >UL	MS failed upper limit
Pyrethroid Pesticides											
Allethrin, Total (µg/L)	Water	52	Physis O-9034 W	63	124	62	66			BS <LL	BS failed lower limit
Cyfluthrin (µg/L)	Water	50	W5H0425	11	214			258	245	MS >UL	MS failed upper limit
Cypermethrin (µg/L)	Water	50	W5H0425	20	206			229	224	MS >UL	MS failed upper limit

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
Cypermethrin, total, Total (µg/L)	Water	51	Physis O-8132 W	65	120	119	122			BS >UL	BS failed upper limit
Fenvalerate/Esfenvalerate (µg/L)	Water	50	W5H0425	32	193			196	189	MS >UL	MS failed upper limit
L-Cyhalothrin (µg/L)	Water	50	W5H0425	61	209			211	146	MS >UL	MS failed upper limit
Permethrin (µg/L)	Water	50	W5H0425	37	209			237	245	MS >UL	MS failed upper limit
Permethrin, cis-, Total (µg/L)	Water	50	Physis O-8042 W	41	151	79	30			BS <LL, EST BS/BSD	BS failed lower limit, Estimate due to BS/BSD RPD failed
Permethrin, trans-, Total (µg/L)	Water	55	Physis O-10068 W	41	147	114	165			EST BS/BSD	Estimate due to RPD failure between BS/BSD
Permethrin, trans-, Total (µg/L)	Water	55	Physis O-10070 W	41	147	113	161			EST BS/BSD	Estimate due to RPD failure between BS/BSD
Prallethrin (µg/L)	Water	55	W6E0672	11	247			349	324	MS >UL	MS failed upper limit
Sumithrin (Phenothrin) (µg/L)	Water	50	W5H0425	12	247			264	249	MS >UL	MS failed upper limit
Metals and Selenium											
Aluminum, Dissolved (µg/L)	Water	51	Physis E-10023 W	75	130			134	134	MS >UL	MS failed upper limit
Aluminum, Total (µg/L)	Water	52	Physis E-10054 W	75	130			-2399	-1655	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Arsenic, Dissolved (µg/L)	Water	50	Physis E-8119 W	98	130			130	131	MS >UL	MS failed upper limit
Arsenic, Total (µg/L)	Water	50	Physis E-8119 W	98	130			131	131	MS >UL	MS failed upper limit
Arsenic, Total (µg/L)	Water	54	Physis E-10110 W	99	129	96	100			BS <LL	BS failed lower limit

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
Barium, Total (µg/L)	Water	52	Physis E-10054 W	95	115			90	98	MS <LL	MS failed lower limit
Beryllium, Dissolved (µg/L)	Water	51	Physis E-10023 W	86	118			120	122	MS >UL	MS failed upper limit
Beryllium, Dissolved (µg/L)	Water	54	Physis E-10111 W	86	118			83	83	MS <LL	MS failed lower limit
Beryllium, Dissolved (µg/L)	Water	54	Physis E-10112 W	86	118			82	81	MS <LL	MS failed lower limit
Chromium, Dissolved (µg/L)	Water	51	Physis E-10023 W	91	118			119	119	MS >UL	MS failed upper limit
Iron, Dissolved (µg/L)	Water	55	Physis E-10147 W	65	134			22	187	MS <LL, MS >UL, EST MS/MSD	MS failed lower limit, MS failed upper limit, Estimate due to RPD failure between MS/MSD
Iron, Dissolved (µg/L)	Water	55	Physis E-10147 W	65	134			166	151	MS >UL, EST MS/MSD	MS failed upper limit, Estimate due to RPD failure between MS/MSD
Iron, Total (µg/L)	Water	50	Physis E-8119 W	74	124			70	69	MS <LL	MS failed lower limit
Iron, Total (µg/L)	Water	52	Physis E-10054 W	65	134			-3415	-2843	MS <LL	MS failed lower limit
Iron, Total (µg/L)	Water	55	Physis E-10147 W	65	134			-12	-73	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Iron, Total (µg/L)	Water	55	Physis E-10147 W	65	134			143	138	MS >UL, EST MS/MSD	MS failed upper limit, Estimate due to RPD failure between MS/MSD
Manganese, Dissolved (µg/L)	Water	51	Physis E-10023 W	93	121			128	124	MS >UL	MS failed upper limit

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
Manganese, Total (µg/L)	Water	50	Physis E-8119 W	93	121			92	92	MS <LL	MS failed lower limit
Manganese, Total (µg/L)	Water	52	Physis E-10054 W	83	125			37	57	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Mercury, Total (µg/L)	Water	52	Physis E-9081 W	73	140			157	155	MS >UL	MS failed upper limit
Selenium, Dissolved (µg/L)	Water	50	Physis E-8119 W	83	134			141	137	MS >UL	MS failed upper limit
Selenium, Total (µg/L)	Water	50	Physis E-8119 W	83	134			135	136	MS >UL	MS failed upper limit
Silver, Dissolved (µg/L)	Water	50	Physis E-8119 W	68	106			61	60	MS <LL	MS failed lower limit
Silver, Total (µg/L)	Water	50	Physis E-8119 W	68	106			49	50	MS <LL	MS failed lower limit
Strontium, Dissolved (µg/L)	Water	50	Physis E-8119 W	75	125			51	46	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Strontium, Dissolved (µg/L)	Water	50	Physis E-8119 W	75	125			-35	-25	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Strontium, Dissolved (µg/L)	Water	51	Physis E-1023 W	75	125			142	146	MS >UL	MS failed upper limit
Strontium, Dissolved (µg/L)	Water	51	Physis E-10023 W	75	125			517	396	MS >UL	MS failed upper limit
Strontium, Dissolved (µg/L)	Water	51	Physis E-10024 W	75	125			169	174	MS >UL	MS failed upper limit
Strontium, Dissolved (µg/L)	Water	52	Physis E-10053 W	75	125			154	171	MS >UL	MS failed upper limit
Strontium, Dissolved	Water	53	Physis E-10089	75	125			292	324	MS >UL	MS failed upper limit

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
(µg/L)			W								
Strontium, Dissolved (µg/L)	Water	53	Physis E-10090 W	75	125			143	136	MS >UL	MS failed upper limit
Strontium, Dissolved (µg/L)	Water	54	Physis E-10090 W	75	125			113	130	MS >UL	MS failed upper limit
Strontium, Dissolved (µg/L)	Water	54	Physis E-10090 W	75	125			129	127	MS >UL	MS failed upper limit
Strontium, Dissolved (µg/L)	Water	54	Physis E-10111 W	75	125			424	376	MS >UL	MS failed upper limit
Strontium, Dissolved (µg/L)	Water	54	Physis E-10112 W	75	125			163	145	MS >UL	MS failed upper limit
Strontium, Dissolved (µg/L)	Water	55	Physis E-10147 W	75	125			189	404	MS >UL, EST MS/MSD	MS failed upper limit, Estimate due to RPD failure between MS/MSD
Strontium, Dissolved (µg/L)	Water	55	Physis E-10147 W	75	125			131	115	MS >UL, EST MS/MSD	MS failed upper limit, Estimate due to RPD failure between MS/MSD
Strontium, Total (µg/L)	Water	50	Physis E-8119 W	75	125			-29	-25	MS <LL	MS failed lower limit
Strontium, Total (µg/L)	Water	52	Physis E-10054 W	75	125			34	75	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Strontium, Total (µg/L)	Water	55	Physis E-10147 W	75	125			-64	55	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Titanium, Dissolved (µg/L)	Water	50	Physis E-8119 W	75	131			-13	-1	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between

Constituent	Matrix	Event	Lab Batch	LCL	UCL	LCS %Rec	LCSD %Rec	MS %Rec	MSD %Rec	Program Qualifier	Comments
MS/MSD											
Titanium, Dissolved (µg/L)	Water	51	Physis E-10023 W	75	131			168	157	MS >UL	MS failed upper limit
Titanium, Dissolved (µg/L)	Water	54	Physis E-10111 W	75	131			133	114	MS >UL	MS failed upper limit
Titanium, Dissolved (µg/L)	Water	55	Physis E-10147 W	75	131			121	166	MS >UL, EST MS/MSD	MS failed upper limit, Estimate due to RPD failure between MS/MSD
Titanium, Total (µg/L)	Water	50	Physis E-8119 W	75	131			-12	-6	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Titanium, Total (µg/L)	Water	52	Physis E-10054 W	75	131			51	59	MS <LL	MS failed lower limit
Titanium, Total (µg/L)	Water	55	Physis E-10147 W	75	131			45	70	MS <LL, EST MS/MSD	MS failed lower limit, Estimate due to RPD failure between MS/MSD
Vanadium, Dissolved (µg/L)	Water	51	Physis E-10023 W	101	121			131	131	MS >UL	MS failed upper limit
Zinc, Total (µg/L)	Water	52	Physis E-10054 W	85	132			150	83	MS <LL, MS >UL, EST MS/MSD	MS failed lower limit, MS failed upper limit, Estimate due to RPD failure between MS/MSD

LCL = Lower Control Limit
 UCL = Upper Control Limit
 MS = Matrix Spike
 MS = Matrix Spike Duplicate
 LCS = Laboratory Control Spike
 LCSD = Laboratory Control Spike Duplicate
 %Rec = Percent Recovery



Revolon Slough/Beardsley Wash Trash TMDL TMRP/MFAC 2015-2016 Annual Report

submitted to

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES
REGION

on behalf of the

COUNTY OF VENTURA,
VENTURA COUNTY WATERSHED PROTECTION DISTRICT,
CITY OF CAMARILLO,
CITY OF OXNARD,
PARTICIPANTS IN THE VENTURA COUNTY AGRICULTURAL IRRIGATED
LANDS GROUP,
AND CALIFORNIA DEPARTMENT OF TRANSPORTATION



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Executive Summary

The purpose of this report is to present the results of the seventh-year (2015-2016) monitoring efforts conducted in accordance with the Revolon Slough and Beardsley Wash Trash TMDL (Trash TMDL), which is effective as of March 6, 2008, and the Trash Monitoring and Reporting Plan (TMRP) Minimum Frequency of Assessment and Collection/Best Management Practice (MFAC/BMP) Program. The Los Angeles Regional Water Quality Control Board (Regional Board) approved Addendum No. 1 to the TMRP in June 2015, which revised the monitoring program from a quantitative program to a visual program. The seventh-year monitoring effort was the first full year of monitoring under Addendum No.1 to the TMRP.

The responsible parties are complying with the non-point source requirements of the Trash TMDL through the implementation of a MFAC/BMP Program and complying with the point source requirements through the installation of certified trash full capture devices on all responsible parties' conveyances discharging to Revolon Slough and Beardsley Wash and/or implementing a point source-specific MFAC/BMP Program within the Revolon Slough and Beardsley Wash subwatershed.

During the first full year of implementation, the responsible parties were able to gain a better understanding of trash accumulation trends and potential sources at each site. High trash levels were found at Site 1 and Site 5, so the responsible parties decided to increase BMP implementation in the areas surrounding these sites to further address trash. Overall, the MFAC/BMP Program is effective for addressing trash as none of the five monitoring sites met the criteria for increased BMP implementation (four consecutive months of Category 3 trash conditions). The non-point source-responsible parties are in compliance with the requirements of the Trash TMDL as the MFAC Program resulted in zero trash in-stream immediately following all of the monitoring events. Non-point source-responsible parties will continue to conduct all required MFAC events and implement BMPs at high trash generating areas as well as watershed-wide to reduce the discharge of trash from their jurisdictions to minimize the impact of trash in the watershed per the Regional Board-approved June 2015 Addendum No. 1 to the TMRP.

To address point sources, the responsible parties, where feasible, have, and will continue to install full capture devices on conveyances discharging to Revolon Slough and Beardsley Wash and/or install full capture devices in high trash generating areas and employ a point source-specific MFAC/BMP Program in other areas of their jurisdictions.

Per previous communications with Regional Board staff, the City of Camarillo is currently meeting compliance with the point source requirements of the Trash TMDL through a point source MFAC/BMP Program (see **Section 3.2.1.** for information on the City's point source MFAC/BMP Program). Further, the City continues to maintain the 33 trash full capture devices that were installed in City of Camarillo storm drain catch basins in the high trash generating areas within the Revolon Slough and Beardsley Wash subwatershed.

The City of Oxnard employs various BMPs to address trash including catch basin inspection and cleaning, open channel maintenance, street sweeping, education and outreach, stormwater ordinances, and commercial/industrial facilities and construction site inspections. The City of Oxnard has not yet been able to install full capture devices for conveyances discharging to

Revolon Slough and Beardsley Wash. The City of Oxnard identified 106 catch basins that require retrofitting. A staff report has been prepared and the project has been assigned to the Capital Improvement Project (CIP) Division. The CIP Division is currently working with the City of Oxnard's finance department to secure funding to install the full capture devices. While full capture device planning is ongoing, the City is continuing to implement BMPs within their jurisdiction to address point sources of trash and participate in the non-point source MFAC/BMP program. The non-point source MFAC/BMP program results in cleanups of a site within the City of Oxnard to support point source compliance as well.

For point sources, the County completed installing full capture devices in conveyances it is responsible for and is meeting the March 2016 requirement of 100 percent of the conveyances discharging to Revolon Slough and Beardsley Wash addressed by full capture devices.

The California Department of Transportation (Caltrans) has installed 24 biofiltration swales and one Austin Vault Sand Filter along Highway 101 in the Revolon Slough and Beardsley Wash subwatershed. The biofiltration swales and Austin Vault Sand Filter were installed to address a suite of constituents including metals and selenium; organochlorine pesticides, PCBs, and siltation; and trash. Caltrans will continue to implement its current suite of BMPs as outlined in the TMRP as well as study the maintenance impact for installing full capture devices, and when it is possible, implement future potential full trash capture devices, subject to funding availability and TMDL Reach Prioritization as completed under the new Caltrans MS4 Permit. The continued implementation of current BMPs and the implementation of future potential BMPs will be directed by results obtained from future monitoring events as part of the adaptive management compliance approach. Caltrans has plans of installing five infiltration trenches along Highway 34 in 2019 subject to funding availability and the TMDL Reach Prioritization.

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1 Overview

This Annual Report is being submitted to fulfill the compliance requirements of the Amendments to the Water Quality Control Plan – Los Angeles Region for the Revolon Slough and Beardsley Wash Trash TMDL (Trash TMDL), Resolution No. R4-2007-007 (effective March 6, 2008). The purpose of this Annual Report is to present the results of seventh-year (2015-2016) monitoring efforts associated with the Revolon Slough/Beardsley Wash Trash Monitoring and Reporting Plan (TMRP) - Addendum No. 1 and associated Minimum Frequency of Assessment and Collection/Best Management Practice (MFAC/BMP) Program.

The Annual Report includes:

- MFAC/BMP Program Summary and Assessment;
- Compliance strategy; and
- Proposed revisions to MFAC/BMP Program.

This effort is being completed on behalf of the responsible parties to the Trash TMDL as listed in **Table 1**.

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

Responsible Party	Non-point Source	Point Source
City of Camarillo	X	X ¹
City of Oxnard	X	X ²
Ventura County	X	X ²
Ventura County Watershed Protection District (VCWPD)	X	X
Participants in the VCAILG ^{3, 4}	X	
California Department of Transportation (Caltrans) ⁵		X ²

1. The City of Camarillo is complying with the point source requirements through a point source-specific MFAC/BMP Program.
2. These Responsible Parties are complying with the point source requirements through installation of certified trash full capture devices on all conveyances discharging to Revolon Slough and Beardsley Wash.
3. Ventura County Agricultural Irrigated Lands Group.
4. Not listed as point sources in the Trash TMDL.
5. Caltrans was not given a non-point source Load Allocation (LA) in the TMDL yet is voluntarily participating in the MFAC to meet the TMDL goals.

To complete this effort, the responsible parties hired the California Conservation Corps (CCC) to conduct field monitoring efforts and Larry Walker Associates (LWA) to oversee and conduct monitoring efforts as well as complete reporting requirements. The monitoring efforts during 2015-2016 were conducted according to the TMRP Addendum No. 1, which was submitted to the Regional Board in June 2015. TMRP Addendum No. 1 revised the non-point source MFAC Program from a quantitative assessment-based program to a visual assessment-based program. A TMRP update was necessary to improve the effectiveness of the MFAC Program to more efficiently assess trash levels in Revolon Slough and Beardsley Wash, target actions towards reducing trash quantities, and better utilize available resources. The revised MFAC Program was initiated in July 2015 and this Annual Report provides the results from October 2015 to September 2016.

1.1 ASSESSMENT SITE LOCATIONS

Five visual assessment sites were included in TMRP Addendum No. 1, with four of the sites comprised of assessment sites from the previous MFAC Program (Sites 1, 3a, 5 and 8) and one site comprised of a new assessment location in the City of Oxnard (Site 10). The assessment sites listed below are also depicted in **Figure 1** and detailed in **Appendix 1**.

Assessment Sites:

- Site 1: Revolon Slough and its adjacent land areas at Wood Road (the end of the concrete-lined channel). (MFAC-required)
- Site 3a: Drain outlet on the north side of Camarillo Hills Drain between Las Posas Road and Springville Drive. (MFAC-required)
- Site 5: Agriculture Drain – East of Wood Road on Etting Road.
- Site 8: Caltrans Site at the 101 Freeway Bridge over Revolon Slough.
- Site 10: 5th Street Drain in the City of Oxnard. (MFAC-required)

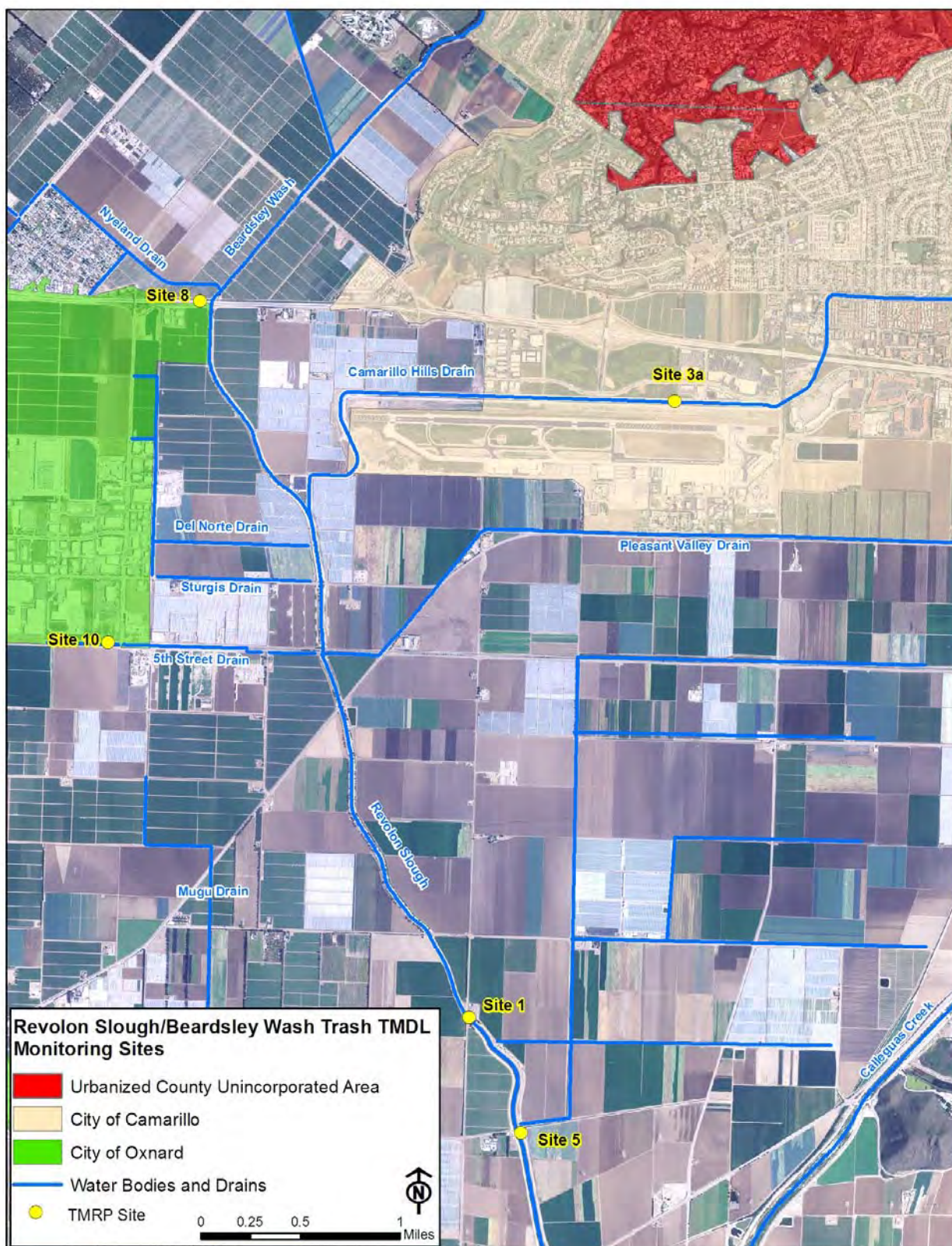


Figure 1. TMRP/MFAC Program Sites

2 Visual MFAC Program

This section provides a summary of the visual monitoring program implemented October 2015 through September 2016.

2.1 MFAC/BMP PROGRAM APPROACH

The goal of the MFAC/BMP program is to address non-point sources of trash in the Revolon Slough and Beardsley Wash watershed. The MFAC/BMP program includes implementing BMPs as outlined in the TMRP and conducting monitoring to assess the effectiveness of BMP implementation.

The revised MFAC/BMP Program includes the following elements:

- 1. Conduct monthly assessments and trash collection events**

MFAC events are conducted monthly at the monitoring sites. The collection aspect of the MFAC utilizes information from the assessments (visual surveys) to determine the locations where trash collection efforts should be focused for the event.

- 2. Conduct regular cleanups**

Although the TMRP outlined quarterly cleanups, the responsible parties have been conducting monthly cleanups to reduce the amount of trash entering the Revolon Slough and Beardsley Wash.

- 3. Employ additional BMPs**

Information gathered during the MFAC events are used to inform the responsible parties as to the level and frequency of BMP implementation, including special trash cleanups, needed to achieve a Category 1 level of trash, as detailed below.

2.2 MONITORING APPROACH

The monitoring approach is a streamlined visual survey of trash levels at select sites within Revolon Slough and Beardsley Wash and sites within conveyances that discharge to Revolon Slough and Beardsley Wash. The visual survey uses a component of the Surface Water Ambient Monitoring Program Rapid trash Assessment Protocol (SWAMP Protocol) and visual assessment approaches being utilized by the City of Ventura, the Santa Clara Valley Urban Runoff Pollution Prevention Program in the San Francisco Bay Area, and a number of cities and municipalities throughout the country.

The visual surveys utilize a three-point system based on the “Level of Trash” scoring category discussed in the SWAMP Protocol to estimate the presence of litter in a specific area. Individuals performing the visual surveys are trained on how to properly conduct these assessments to ensure consistency when performing such surveys and are trained to score each assessed area by rating the amount of litter observed, using the following categories:

- Category 1 – Represents the SWAMP Category “Optimal”
- Category 2 – Represents the SWAMP Category “Suboptimal”
- Category 3 – Represents the SWAMP Category “Poor”

The definition of Category 1 is:

“On first glance, no trash visible. Little or no trash (<10 pieces) evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.”

The definition of Category 2 is:

“On first glance, low to medium levels of trash are evident (10 – 100 pieces). Stream, bank surfaces, and riparian zone contain some litter and debris. Possible evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, clothing.”

The definition of Category 3 is:

“Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris (>100 pieces). Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing.”

Visual monitoring is conducted monthly for each designated site (**Table 2**).

2.3 MFAC/BMP PROGRAM ASSESSMENT APPROACH

As stated above, the goal of the MFAC/BMP Program is to address non-point sources of trash in Revolon Slough and Beardsley Wash. Results of the monitoring are used to evaluate the effectiveness of the MFAC/BMP Program and to support any necessary modifications. The MFAC/BMP Program is continuously evaluated and modified using an adaptive management approach consistent with the procedures outlined in the TMRP - Addendum No. 1 and as summarized below:

1. Monitoring sites classified in Category 1 during the visual monitoring event are noted and any trash observed is collected during the visual monitoring event.
2. Monitoring sites classified in Category 2 are evaluated to determine if and what type of additional BMPs are needed to reduce the accumulation of trash between visual monitoring events with intent to move these sites to Category 1.
3. Monitoring sites classified in Category 3 for four (4) consecutive monthly visual monitoring events initiate more frequent additional cleanups in the areas surrounding the sites to address trash. It is anticipated that the additional cleanups will address trash thereby moving the site to Category 2 and then to Category 1.

2.4 COMPLETED MONITORING EVENTS

Seventh-year visual monitoring for the Trash TMDL was conducted from October 2015 to September 2016 at the frequencies detailed in **Table 2**. The completed monitoring events are shown in **Table 3** and **Appendix 2** contains example photos from a typical MFAC Event.

Table 2. TMRP Seventh-Year Visual Assessment Monitoring Event Frequency

Site	Frequency
Site 1 – Revolon Slough At Wood Road	Once Monthly ¹
Site 3a – Storm drain outlet on the north side of Camarillo Hills Drain just downstream of Las Posas Road	Once Monthly ¹
Site 5 – Agricultural Drain East of Etting Road	Once Monthly ²
Site 8 – Caltrans Site on side of US101 just west of Revolon Slough	Once Monthly ²
Site 10 – 5 th Street Drain at Del Norte Boulevard	Once Monthly ¹

1. The Trash TMDL specifically required these sites to be included in the MFAC Program.

2. The Trash TMDL did not require these sites; they were included to better characterize trash in the watershed.

Table 3. Completed Visual Assessment Monitoring Events (October 2015 – September 2016)

Site	Month											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	X	X	X	X	X	X	X	X	NA ¹	X	X	X
3a	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X
10	X	X	X	X	X	X	X	X	X	X	X	X

X = Visual assessment monitoring event completed per the TMRP - Addendum No. 1.

1. Site 1 was inaccessible during the June 2016 event due to VCWPD channel maintenance activities.

2.5 MFAC/BMP PROGRAM ASSESSMENT

Seventh-year visual monitoring was the first year to exclusively include Visual Assessment Monitoring methods, in comparison to the sixth year monitoring effort, which was split between Quantitative Monitoring and Visual Monitoring. During the full year of implementation, the responsible parties were able to gain a better understanding of trash accumulation trends and potential sources at each site. The visual assessment categories for each site during the monthly MFAC events from October 2015 to September 2016 are presented in **Table 4**.

During the monitoring events, the main sources and types of trash were identified as originating from agricultural and urban sources. Agricultural trash includes irrigation hose, plastic containers for shipping produce, row crop plastic covering, plant containers, etc. Urban trash includes food wrappers, Styrofoam, cardboard, paper, metal, etc.

Site 1 was found to be consistently in the Category 2 and Category 3 range throughout the reporting period, with the exception of the December 2015 Event. Site 1 was not found to be in Category 3 for four consecutive months, and did not warrant additional BMPs such as more frequent cleanups, as outlined in the TMRP - Addendum No. 1. However, considering the goal of the MFAC/BMP Program is to address trash from non-point sources, the responsible parties decided to expand the areas subject to additional cleanups as a preventative measure to reduce trash discharging to Revolon Slough. In addition, the responsible parties installed anti-litter signage to reduce illegal dumping activities as reoccurring cases of dumping directly in or near the agricultural ditches along Wood Road that drain into Revolon Slough were observed.

Site 3a was consistently found to be in Category 1 for the entire monitoring year indicating that the BMPs implemented to address trash upstream of and along the Camarillo Hills Drain are effective at addressing trash.

Site 5 was found to be primarily in Category 2 during the monitoring year. It is believed that the proximity to several agricultural fields is contributing to the high trash levels. An agricultural ditch is upstream of the site, which runs between several agricultural fields, where trash may accumulate before discharging into Revolon Slough. Site 5 also has significant vegetation within the stream and on the banks, which acts as a natural capture device. Based on the visual assessment data collected, the responsible parties began conducting targeted outreach to the agricultural areas surrounding Site 5 including contacting the owners/operators of the agricultural areas and installing anti-litter signage at key locations in the agricultural areas. Site 5 also had evidence of a homeless encampment during the March 2016 and April 2016 monitoring events, but after crews removed belongings and debris, the individual(s) did not return to the area.

Site 8 was in Category 1 for ten of the twelve months during the monitoring year and in Category 2 for the other two months indicating the BMPs implemented to address trash along the 101 freeway are effective at addressing trash.

Site 10 was in Category 1 eight of the twelve months during the monitoring year. During October 2015 to December 2015, Site 10 was in Category 2 or Category 3, but beginning in January, Site 10 was in Category 1 for the remaining months except for August 2016, when Site 10 was in Category 2. Site 10 had evidence of a homeless encampment within the storm drain, which was the likely cause of the Category 2 conditions found at Site 10 during August 2016. The homeless encampment has since been removed from Site 10.

Overall, the MFAC/BMP Program is effective for addressing trash as none of the five monitoring sites met the criteria for increased BMP implementation (four consecutive months of Category 3 trash conditions). However, as high trash levels were found at Site 1 and Site 5, the responsible parties decided to increase BMP implementation in the areas surrounding these sites to further address trash. The responsible parties are confident these increased BMPs will lead to further trash reduction in these areas.

Table 4. Visual Assessment Trash Categories by Monitoring Site

Site	Visual Assessment Trash Category ¹											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2	2	1	3	2	3	2	2	NA ²	3	2	2
3a	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	2	2	1	3	2	1	2	2	2	2
8	1	2	1	1	1	1	2	1	1	1	1	1
10	2	2	3	1	1	1	1	1	1	1	2	1

1. Number indicates trash category.

2. Site 1 was inaccessible during the June 2016 event due to VCWPD channel maintenance activities.

3 Compliance Strategy

The Trash TMDL requires all annual reports to include proposals to enhance BMPs, revise the MFAC (if needed), and prioritize the installation of full capture devices or other compliance measures, including structural BMPs or trash collection events for high trash generating areas. Additionally, the Trash TMDL requires point source-responsible parties to achieve a 100 percent reduction from the baseline wasteload allocation (WLA) by March 2016. This section describes the proposed compliance strategies to be utilized to meet the non-point source and point source Trash TMDL requirements and to further reduce trash discharges into Revolon Slough and Beardsley Wash.

Non-point source-responsible parties will continue complying with the Trash TMDL through a MFAC/BMP Program that includes a combination of MFAC events and BMPs including structural and non-structural BMPs. The information gathered from the MFAC/BMP Program will guide BMP implementation and selection to ensure efficient and effective compliance with the Trash TMDL. The responsible parties will also utilize adaptive management to allow for flexibility in determining the correct BMPs to implement and the correct locations to implement the BMPs. The proposed adaptive management compliance strategy is as follows:

1. Continue implementation of the approved MFAC Program using the visual assessment method.
2. Continue to implement the current suite of BMPs identified in the TMRP with the additions described in the **Current Best Management Practices Section**;
3. Implement BMPs in the future based on information generated from the MFAC/BMP Program focusing on the high trash generating areas as discussed in the **Future Potential Best Management Practices Section**; and
4. Evaluate the effectiveness and needs for additional BMPs and/or MFAC revisions semi-annually based on the results of the MFAC/BMP Program. The evaluation will consider the results of the visual assessments, on a site-by-site and watershed basis, to prioritize the areas where additional BMP implementation may be most effective in reducing trash levels. Proposed revisions to the MFAC/BMP Program and full capture device or other measure installation/implementation prioritization will be included in each annual report.

To address point sources, the responsible parties, where feasible, are installing full capture devices on conveyances discharging to Revolon Slough and Beardsley Wash and/or installing full capture devices in high trash generating areas and/or employing a point source-specific MFAC/BMP Program in other areas of their jurisdictions.

The following sections outline the jurisdictional BMPs currently being implemented, the additional BMPs to be implemented in prioritized areas, other BMPs being considered for implementation throughout the watershed, and a BMP implementation schedule.

3.1 CURRENT BEST MANAGEMENT PRACTICES

TMRP - Addendum No. 1 lists a suite of BMPs that each responsible party is implementing in their respective jurisdictions. One of the primary modifications to the MFAC/BMP Program in response to the monitoring results is to add additional trash cleanups at the high trash generating sites identified during the monitoring. Initially, the responsible parties contracted with the CCC

to conduct monthly trash cleanups near Sites 1, 3a, and 5 from October 2014 through July 2015. Beginning in August 2015, Sites 8 and 10 were added to the monthly special cleanups. From October 2015 through May 2016, approximately 2,340 pounds of trash in 216 44-, 39-, or 33-gallon bags were removed from Sites 1, 3a, 5, 8, and 10. Beginning in June 2016, the trash cleanup area for Sites 1 was expanded to address trash found in these areas. Approximately 970 pounds of trash in 108 33-gallon bags were removed from Sites 1, 3a, 5, 8, and 10 during June 2016 to September 2016. The total annual amount of trash removed at all sites from October 2015 through June 2016 was 3,310 pounds. Example photos taken during these special cleanups are presented in **Appendix 3**.

In addition to the trash cleanups, the responsible parties implemented the following BMPs to address trash:

3.1.1 City of Camarillo Litter Management Program

TMRP BMP list for the City:

1. Catch basin cleaning - all City catch basins are inspected at least once per year and those in high-trash generating areas are inspected four times per year and all are cleaned when filled with trash to 25 percent or more of the catch basin's capacity. As identified in the City's March 2016 letter to the Regional Board staff, starting with July 2016, the city changed the inspection frequency to quarterly and the metric for determining when a catch basin needs to be cleaned to the same metric used for the nonpoint source program. The first quarterly inspection conducted in July 2016 revealed only 14 percent of the catch basins needed to be cleaned out (84 out of 665). The total pounds of trash removed from all the cleanouts from July 2015 through June 2016 was 698 pounds.
2. Open channel maintenance - all City-maintained channels are inspected and cleaned at least once before the wet season and at least once after the wet season.
3. Trash Management at Public Events - All special use permits for events in the public right of way require proper management of trash and litter.

The following are enhancements/revisions made to the non-point source BMPs listed in the TMRP for the City:

1. Trash removal was also performed along City fence lines near city stormwater system structures in the watershed.
2. The City performs annual debris and trash removal from city-maintained ditches/channels and detention basins. Approximately 30,060 pounds of materials were removed from the structures within the Revolon Slough and Beardsley Wash subwatershed.
3. City arterial streets are swept weekly and residential streets are swept monthly in an attempt to reduce trash accumulating in deleterious amounts on streets within the City.
4. The City requires conditions pertaining to trash to be met for all new development and redevelopment projects within the watershed, including:

- A. Trash full capture devices and post-construction treatment devices for other pollutants of concern must be installed in drain inlets;
 - B. Trash enclosures and/or recycling areas must be properly installed (e.g., covered and including structures to direct stormwater away from entering the enclosures/areas);
 - C. All property areas must be maintained free of litter/debris;
 - D. Onsite storm drains must be cleaned at least twice per year, including once before the beginning of the wet season; and
 - E. Private roads and parking lots must be swept at a minimum of once per month, with two sweepings occurring in October before the beginning of the wet season.
5. The City requires private owners to provide proof of maintenance of their post construction treatment devices annually.
 6. The City hosts household hazardous waste collection events two days per month to provide residents a place to properly dispose of their materials. This reduces the amount of illegal dumping and diverts household hazardous waste from landfills. Camarillo successfully diverted 222,059 pounds of household hazardous waste in 2015-2016 which equals a 99.9 percent diversion rate of items collected during the events.
 7. The City adopted Stormwater Ordinance No. 1032 in December 2012 which includes trash specific prohibitions and fines and penalties for violations of the prohibitions.
 8. The City continued additional measures to its Water Conservation Ordinance in 2015-2016 limiting lawn watering to three days per week, no washing of hard surfaces (i.e., driveways, sidewalks), and imposing penalties for runoff. Further, the City of reduced its water usage by 23.6 percent for the six month period ending July 2016 compared to usage in 2013. These measures will reduce dry weather flows to the storm drain system thereby reducing trash transport.
 9. The City engages in several outreach and education campaigns including:
 - A. The City includes a litter prevention message, at least annually, in its quarterly Cityscene Newsletter, which is distributed to all residents.
 - B. The City includes an insert with all utility bills soliciting volunteers to remove trash in the City on Coastal Cleanup Day and which also educates residents on pollution prevention.
 - C. The City conducts commercial and industrial facility inspections to ensure proper pollutant prevention BMPs are being applied and to educate the employees on the importance of pollution prevention. The City inspected 461 facilities during 2015-2016.
 - D. The City sends out letters to all commercial, industrial, and high-density residential property managers requesting assistance in controlling trash on their property.

- E. The City inspects all construction sites to ensure application of proper pollution prevention BMPs. The City inspected 174 sites in 2015-2016.
- F. The City mails construction site BMP brochures to contractors and developers annually, during fall, to ensure proper pollutant prevention BMPs are being applied especially before the wet season.
- G. The City participates in the Countywide Stormwater Public Outreach Program that includes litter outreach, which can be reviewed at www.cleanwatershed.org. In 2015-2016, over 9.1 million impressions were made via this program with 15 percent of those in Spanish.

The following are enhancements/revisions made to the point source BMPs listed in the TMRP for the City:

- 1. The City installed and is maintaining 44 trash full capture devices in City storm drain catch basins in high trash generating areas throughout the City including 33 devices within the Revolon Slough and Beardsley Wash watershed. However, the City is currently employing a point source MFAC/BMP Program to meet the point source compliance requirements of the Trash TMDL (see **Section 3.2.1.** for information on the City's point source MFAC/BMP Program).

3.1.2 City of Oxnard Litter Management Program

- 1. Catch basin cleaning - all City of Oxnard catch basins are inspected at least once per year and those in high-trash generating areas are inspected four times per year and all are cleaned when filled with trash to 25 percent or more of the catch basin's capacity.
- 2. Open channel maintenance - all City of Oxnard-maintained channels are inspected and cleaned at least once per year before the wet season and at least once per year after the wet season.
- 3. City of Oxnard arterial streets are swept weekly and residential streets are swept monthly in an attempt to reduce trash accumulating in deleterious amounts on streets within the City of Oxnard.
- 4. Trash Management at Public Events - All special use permits for events in the public right of way require proper management of trash and litter.
- 5. The City of Oxnard requires conditions pertaining to trash to be met for all new development and redevelopment projects within the watershed, including:
 - A. Trash full capture devices and post-construction treatment devices for other pollutants of concern must be installed in drain inlets;
 - B. Trash enclosures and/or recycling areas must be properly installed (e.g., covered and including structures to direct stormwater away from entering the enclosures/areas);
 - C. All property areas must be maintained free of litter/debris;
 - D. Onsite storm drains must be cleaned at least twice per year, including once before the beginning of the wet season; and

- E. Private roads and parking lots must be swept at a minimum of once per month, with two sweepings occurring in October before the beginning of the wet season.
- 6. The City of Oxnard requires private owners to provide proof of maintenance of their post construction treatment devices annually.
- 7. The City of Oxnard accepts household hazardous wastes at the Del Norte Regional Recycling Station Monday - Saturday to provide residents a place to properly dispose of their materials. This reduces the amount of illegal dumping.
- 8. The City of Oxnard adopted Stormwater Ordinance No. 2876 in November 2013, which includes trash specific prohibitions and fines and penalties for violations of the prohibitions.
- 9. The City of Oxnard imposed additional measures to its Water Conservation Ordinance in 2014 by prohibiting lawn watering except between 4 PM and 9 AM or 6 PM and 9AM during daylight savings, no washing of hard surfaces (i.e., driveways, sidewalks), and imposing penalties for runoff. These measures will reduce dry weather flows to the storm drain system thereby reducing trash transport.
- 10. The City catch basins are labeled, “Don’t pollute, Flows to Waterways”.
- 11. The City of Oxnard engages in several outreach and education campaigns including:
 - A. The City of Oxnard has established the www.oxnardnews.org website which disseminates information regarding pollution prevention, household hazardous waste roundups, Coastal Clean-up day and water conservation.
 - B. The City of Oxnard includes an insert with all utility bills soliciting volunteers to remove trash in the City of Oxnard on Coastal Cleanup Day which also educates residents on pollution prevention.
 - C. The City of Oxnard conducts commercial, industrial, and construction facility/site inspections to ensure proper pollutant prevention BMPs are being applied and to educate the employees on the importance of pollution prevention.
 - D. The City of Oxnard sends out letters to all commercial, industrial, and high-density residential property managers requesting assistance in controlling trash on their property.
 - E. The City of Oxnard inspects all construction sites to ensure application of proper pollution prevention BMPs.
 - F. The City of Oxnard participates in the Countywide Stormwater Public Outreach Program that includes litter outreach, which can be reviewed at www.cleanwatershed.org.

3.1.3 County of Ventura and VCWPD Litter Management Program

The County has a very limited storm drain system within the Trash TMDL responsibility area. In 2014, eight StormTek® connector pipe screen full capture devices were installed. The final inspection of the eight full capture devices was completed in October 2014 towards 100 percent

Trash TMDL compliance. However, additional storm drain system analysis indicated the installed devices were insufficient to meet point source compliance requirements. In May 2015, the County issued a contract for a site suitability analysis for installation of additional full capture devices within the Revolon Slough/Beardsley Wash watershed. The results of this study showed that 48 additional full capture devices were required to meet the 100 percent full capture requirement. The County installed the remaining 48 full capture devices and is meeting the 100 percent point source compliance requirement. For details, refer to “County of Ventura Full Capture Connector Pipe Screen Trash Excluder Certification Report” provided in **Appendix 4**.

1. Catch basin cleaning - Catch basins are inspected at least once a year and cleaned when filled to 25 percent or more of the catch basin’s capacity. During storm season, all drainage facilities are inspected and cleaned as necessary.
2. Open channel storm drain maintenance - All VCWPD-owned and -maintained channels are cleared, inspected, and cleaned as required at least once per year. During the annual 2015-2016 channel sediment cleaning of Revolon Slough and Beardsley Wash, a total of 5,362 tons of combined plant material, sediment and trash were removed. Trash accounted for approximately 3.8 tons of the removed material.
3. Trash Management at Public Events - A proper Management of Trash and Litter Plan is required when obtaining a permit for staging public events. This Plan requires adequate facilities for trash collection and disposal.
4. Public areas - Trash receptacles have been placed within high trash generation areas. These devices are cleaned and maintained regularly to prevent trash overflow.
5. The Stormwater Quality Management Ordinance for Unincorporated Areas (Ventura County Ordinance No. 4450) includes litter and trash specific prohibitions for the discharge or deposition of trash that may enter the County storm drain system or receiving waters (Section 6942). The ordinance also includes civil penalties for violations and provisions for issuing administrative fines, recovery of costs and misdemeanor violations.
6. County catch basins are labeled, “Don’t pollute, Flows to Waterways”.
7. New watershed awareness signs have been installed at key locations at major roadway crossings of Revolon Slough and Beardsley Wash, stating “Calleguas Creek Watershed, Keep It Clean!” In addition, in June 2016, the County/VCWPD installed 11 bilingual “No Dumping Allowed” signs at six locations at access points along Revolon Slough and Beardsley Wash, where illegal dumping has occurred. Photos of the newly installed signs are provided in **Appendix 5**.
8. In October 2013, an anti-littering billboard space was leased from ClearChannel with a message posted for a month along Highway 101 (near the Del Norte overcrossing) stating “Our Oceans are Drowning in Plastic”, encouraging proper disposal of waste and recyclable materials. This location was seen by 97,000 people per day (estimated at 64,000 Ventura County residents and 33,000 others travelling through the area) for the entire month of October.
9. On July 31, 2012 the County of Ventura Board of Supervisors received and filed a draft model Single-Use Bag Ordinance referred to the County by the Beach Erosion Authority for Clean Oceans and Nourishment (BEACON). The County endorsed the

- use of up to \$8,000 as the County's pro-rata share of a regional Environmental Impact Report (EIR) to be prepared by BEACON, which is required to be completed under the California Environmental Quality Act (CEQA) before the model single-use bag ban can be adopted. This was the first step for the County to move forward with the consideration of adoption of a single-use plastic bag ban.
10. On June 24, 2014 the County of Ventura Board of Supervisors approved a motion directing the County of Ventura Executive Officer to have staff prepare a Single-Use Bag Ordinance modeled on the BEACON Ordinance.
 11. The County and VCWPD continue to participate in the Countywide Stormwater Program to provide outreach and education retaining the services of "The Agency", a professional advertisement group that designs and conducts Countywide, bilingual outreach programs advocating proper trash disposal. The most recent addition to the outreach program is trash prevention and protection of stormwater quality education using Facebook®. This program made over 9.1 million countywide media impressions (TV, radio, internet, transit shelters) including 15 percent of those impressions in Spanish.
 12. The County conducts commercial, industrial, and construction facility/site inspections to ensure proper pollutant prevention BMPs are being applied and to educate the employees on the importance of pollution prevention. The County inspects the 362 businesses at least twice during the Ventura County MS4 Permit Term.
 13. The County requires private owners to provide proof of maintenance of their post construction treatment devices annually.
 14. On September 17, 2016, County staff captained a Coastal Cleanup Day site in Beardsley Wash. 23 volunteers cleaned two sections of Beardsley Wash and removed 515 pounds of trash that included food and tobacco product wrappers, cigarette butts, as well as glass and plastic bottles. In addition, VCWPD crews removed 45 illegally dumped tires from Beardsley Wash weighing 2,020 pounds and an illegally dumped couch.

3.1.4 VCAILG Litter Management Program

During the 2015-2016 monitoring year, VCAILG provided education and outreach to a diverse group of owners and growers throughout Ventura County. Certain aspects of the education and outreach discuss trash BMPs for agricultural areas and information regarding the Trash TMDL. In addition, at a September 2016 VCAILG educational meeting, Regional Board staff gave an overview of the new Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region (Conditional Waiver) and the TMDL requirements under the Conditional Waiver, including those for trash.

VCAILG has been conducting direct outreach to agricultural areas surrounding Site 1 and Site 5 to address agricultural trash that was found near those sites. In addition, VCAILG installed anti-littering signs near the agricultural areas surrounding Site 1 and Site 5.

3.1.5 Caltrans Litter Management Program

Caltrans implements a variety of BMPs in the watershed along the freeways and highways. These BMPs are a suite of programs done to reduce trash as follows.

1. Street Sweeping
2. Trash Collection
3. Adopt-a-Highway Program

Caltrans (District 7, serving Los Angeles and Ventura Counties) uses a variety of methods to educate the public about the importance of managing stormwater. This consists of a variety of written materials, bulletins, and websites. A few venues the District uses to accomplish this are public schools and community sponsored clean up events, Bring Your Child to Work Day, and Earth Day. The written material is designed to appeal to the public while providing technical information on selected Caltrans projects and activities. Caltrans continues to install stenciled warnings prohibiting discharges to drain inlets at park and ride lots, rest areas, vista points and other areas with pedestrian traffic. Additionally, Caltrans has installed 24 biofiltration swales and one Austin Vault Sand Filter along Highway 101 in the Revolon Slough and Beardsley Wash subwatershed. The biofiltration swales and Austin Vault Sand Filter were installed to address a suite of constituents including metals and selenium; organochlorine pesticides, PCBs, and siltation; and trash.

3.2 FUTURE POTENTIAL BEST MANAGEMENT PRACTICES

Future potential BMPs specific to each responsible party are detailed below.

3.2.1 City of Camarillo Litter Management Program

To address non-point sources, the City will focus BMP efforts at the high trash generating areas identified through the MFAC Program and continue watershed-wide BMP activities as a means to further reduce the discharge of trash to Revolon Slough and Beardsley Wash.

For point sources, the City has been complying with the Trash TMDL's point source requirements by installing full capture systems and has installed 44 full capture systems citywide in the areas designated by the City as high trash generating; 33 of those are within the Revolon Slough and Beardsley Wash watershed. However, the City and its residents have recently been impacted by Federal Emergency Management Agency (FEMA) flood plain map revisions, placing residents in flood zones and thus projecting the increased possibility of flooding in those areas. In addition, residents in these areas are now required to purchase expensive flood insurance. As such, the City is going to analyze the existing full capture systems under more substantial rain events to ensure they operate efficiently and safely before installing additional full capture systems that could potentially increase flooding issues in these FEMA-designated flood plains. Therefore, the City has started compliance with the point source requirements of the Trash TMDL through a point source MFAC/BMP Program, as identified in the March 6, 2016 letter to Regional Board staff.

In May 2015, the City submitted a letter to the Regional Board staff detailing a proposed point source compliance option and requesting Regional Board approval. Subsequently, in July 2015 the City met with Regional Board staff to discuss the City's May 2015 letter. In October 2015,

per a Regional Board staff request, the City submitted additional data related to the point source compliance option. On December 14, 2015, the City received a response letter from the Regional Board stating it was unable to approve the City's requested point source strategy. On March 3, 2016, the City submitted another letter to the Regional Board in response to the December 14, 2015 letter detailing a revised, proposed point source compliance strategy (listed below). As of the submittal date of this annual report, the City has not received approval of the proposed point source compliance option.

Until the Regional Board re-considers the Trash TMDL related to the Statewide Trash Policy's priority land use areas, the City will address all land uses (non-priority and priority) within the Revolon Slough and Beardsley Wash watershed by conducting a point source MFAC/BMP Program, which will consist of implementing the suite of BMPs currently employed by the City, as detailed in TMRP - Addendum No. 1 and Annual Monitoring Reports, as well as inspecting and monitoring catch basins for trash and/or leaf litter. The City is implementing the following inspection and collection schedule for non-priority land use area catch basins to serve as the assessment collection aspect of the MFAC/BMP Program:

- Initially, the City will conduct quarterly visual inspections for all non-priority land use catch basins.
- Inspection frequencies may be modified for particular catch basins based on the amount of trash and/or anthropogenic landscape litter (dumped grass clippings) present during initial quarterly inspections. A minimum inspection frequency interval will be selected that prevents trash and/or leaf litter from accumulating in deleterious amounts between collections.
- Collection events will occur concurrently with the assessments and the City will ensure zero trash and/or leaf litter will remain after the collection event.

Based on this inspection and cleaning schedule, catch basins cleaned one or fewer times (i.e., no trash/anthropogenic landscaping litter found during inspections) over a rolling three-year period will be considered equivalent to catch basins with full capture devices installed. This determination is based on trash and/or anthropogenic landscaping litter not accumulating in the catch basins and therefore not being discharged to Revolon Slough and Beardsley Wash. This also indicates the BMPs implemented by the City are addressing trash equivalent to full capture devices. If any catch basin does not maintain its one or fewer cleaning status, the catch basin and/or area surrounding the catch basin will be addressed via trash-control BMPs to return the catch basin to the one or fewer cleaning category and, depending on the results of the full capture systems analyses, may be addressed by a full capture system. If the Regional Board revises the Trash TMDL to only focus on priority land uses, the MFAC/BMP Program will be ceased for the non-priority areas and the inspection and cleaning protocols will revert to the requirements of the Ventura County MS4 Permit.

In order to assess compliance with the 100 percent reduction from the baseline WLA requirement, the City calculated a point source baseline WLA for: (1) all land uses and (2) only the priority land uses, using land use acreage determined through geographic information system (GIS) analyses and trash generation rate (TGR) data obtained through a review of reports that contain trash generation rate data. A baseline WLA of 2,738 gallons per year was calculated for all land uses and a baseline WLA of 1,653 gallons per year was calculated for only the priority

land use areas. In essence, if the City's BMPs address at least 2,738 gallons per year of trash, then they will be in compliance with the 100 percent reduction from the baseline WLA.

In 2015-2016, the City removed 54,628 gallons of trash through the implemented trash control measures (**Table 5**). Further, the City began point source MFAC/BMP Program quarterly inspections in July 2016. The July 2016 inspection revealed that only 84 catch basins had to be cleaned, which equates to only 14 percent of the total 665 catch basins. Therefore, trash and debris are not accumulating in deleterious amounts between the inspection and collection events. The City is confident the current trash control measures implemented as well as the point source MFAC/BMP Program are effectively meeting the point source requirements of the Trash TMDL.

Table 5. Materials Removed via Various City Trash-Control Measures Implemented in 2015-2016

BMP	Estimated Amount Removed	Amount of Trash	Amount of Leaf Litter ²	Amount of Sediment
Amount of trash collected in pounds				
Catch Basin Cleaning	13,959	698	10,469	2,792
Street Sweeping	644,800	128,960	257,920	128,960
Ditch, Channel, and Detention Basin Cleaning	30,060	6,012	12,024	6,012
Fence Line Trash Removal	900	900	0	0
Total	689,719	136,570	280,413	137,764
Amount of trash collected in gallons¹				
Catch Basin Cleaning	5,584	279	4,188	1,117
Street Sweeping	257,920	51,584	103,168	51,584
Ditch, Channel, and Detention Basin Cleaning	12,024	2,405	4,810	2,405
Fence Line Trash Removal	360	360	0	0
Total	275,888	54,628	112,166	55,106

1. Pounds converted to gallons using 2.5 pounds=1 gallon from: Michael Baker International. Literature Review for Trash Amendment Compliance Strategy. Contract No. 534079, Task Order 52. Prepared for: County of San Diego Department of Public Works. July 2015.

2. Leaf litter is not anthropogenic landscaping litter but literally leaves from adjacent trees. Dumped landscaping litter is considered trash and is accounted for under "trash" category.

3.2.2 City of Oxnard Litter Management Program

The City owns and operates the Del Norte Regional Recycling and Transfer Station, which is responsible for accepting, transferring and disposing of approximately 200,000 solid waste tons each year from the City, permitted haulers, and self-haulers throughout the region, as well as materials recovery, which is responsible for diverting material from the waste stream to prevent marketable recyclable material and divertible material from entering the landfill. The City has entered into agreements with organizations such as the Carpet America Recovery Effort (carpetrecovery.org) and Recycle with Paint Care (paintcare.org) for recycling of post consumer products. Green waste is recycled to provide compost soil amendments and other beneficial environmental products. The Del Norte Regional Recycling and Transfer Station includes a buyback center, which is responsible for accepting and dispensing payments to customers that redeem California Redemption Value material such as aluminum cans, plastic beverage containers, and glass. In addition, the Del Norte Regional Recycling and Transfer Station

contains the Recyclable Household Hazardous Waste Center, which is responsible for accepting and recycling material from City residents that drop-off antifreeze, batteries, used motor oil, water-based paint and electronic devices. For hazardous wastes that are not accepted at Del Norte Regional Recycling and Transfer Station, the City offers Household Hazardous Waste Collection Events which are held at a separate location and allow residents to transport up to 15 gallons or 125 lbs household hazardous waste to the event. There is also a special program available once per month for Oxnard Conditionally Exempt Small Quantity Generator Businesses (CESQG's). A CESQG generates or stores less than 27 gallons or 200 pounds of Hazardous Waste per month. A CESQG may qualify for a limited amount of free disposal.

The City of Oxnard will continue to promote the City's Green Sustainability Programs with robust outreach focused on pollution prevention and environmental sustainability. The City of Oxnard has started a new "On the Road to Zero Waste" campaign which encourages community participation through a series of workshops designed to educate the public and garner community input. The program has vision of zero waste with a guiding principle to protect the environment and public health.

Additionally, the City of Oxnard joined efforts with the Calleguas Creek Stakeholder Group during the 2014-2015 monitoring year and is participating in the approved TMRP - Addendum and MFAC/BMP Program for trash monitoring and BMP implementation. The City of Oxnard will focus BMP efforts at the high trash generating areas identified through the MFAC Program and continue watershed-wide BMP activities as a means to further reduce the discharge of trash to Revolon Slough and Beardsley Wash.

For point sources, the City of Oxnard has not yet been able to install full capture devices for conveyances discharging to Revolon Slough and Beardsley Wash. The City of Oxnard identified 106 catch basins that require retrofitting. A staff report has been prepared and the project has been assigned to the Capital Improvement Project (CIP) Division. The CIP Division is currently working with the City of Oxnard's finance department to secure funding to install the full capture devices. While full capture device planning is ongoing, the City is continuing to implement BMPs within their jurisdiction to address point sources of trash and participate in the non-point source MFAC/BMP program. The non-point source MFAC/BMP program results in cleanups of a site within the City of Oxnard to support point source compliance as well.

3.2.3 County of Ventura and VCWPD Litter Management Program

The County/VCWPD will continue to install and implement structural and non-structural BMPs to address non-point source trash to minimize the discharge of trash from their jurisdictions as part of the MFAC/BMP Program. BMPs will include monthly trash cleanups at high trash generating areas. Additionally, the County will conduct targeted outreach to schools within the area covered by the Trash TMDL to educate the students, staff, and faculty on the importance of pollution prevention specifically regarding trash. The scale of BMP implementation will depend on the trash data collected during the 2016-2017 monitoring year. For point sources, the County completed installing full capture devices in conveyances they are responsible for and is meeting the March 2016 requirement of 100 percent of the conveyances discharging to Revolon Slough and Beardsley Wash are addressed by full capture devices (**Appendix 4**).

3.2.4 VCAILG Litter Management Program

As part of the new Conditional Waiver, VCAILG will provide educational classes focused on improving water quality, including identifying trash as an impairment of water quality. VCAILG will make a concerted effort to make trash management a bigger focus during educational classes. Furthermore, based on 2015-2016 monitoring results, VCAILG will assist its members with the implementation of additional BMPs as necessary by following the adaptive process identified in the WQMP. In addition, VCAILG members will continue to be billed separately for Trash TMDLs to further reinforce the idea, through a fiscal measure, that there are trash problems in the watershed.

3.2.5 Caltrans Litter Management Program

Caltrans will continue to implement its current suite of BMPs as outlined in the TMRP as well as study the maintenance impact for installing full capture devices, and when it is possible, implement future potential full trash capture devices, subject to funding availability and TMDL Reach Prioritization as completed under the new Caltrans MS4 Permit. The continued implementation of current BMPs and the implementation of future potential BMPs will be directed by results obtained from future monitoring events as part of the adaptive management compliance approach. Caltrans has plans of installing five infiltration trenches along Highway 34 in 2019 subject to funding availability and the TMDL Reach Prioritization.

3.3 BEST MANAGEMENT PRACTICES IMPLEMENTATION SCHEDULE

Non-point source-responsible parties intend to continue complying with the Trash TMDL through a visual MFAC/BMP Program, which may include the installation or implementation of structural or non-structural BMPs. The MFAC/BMP Program that was included in TMRP - Addendum No. 1 will continue to be implemented. Additional BMP implementation will be scheduled as appropriate to address the identified high trash generating areas.

Point source-responsible parties will continue installing full capture devices on conveyances discharging to Revolon Slough and Beardsley Wash and/or employ a point source-specific MFAC/BMP Program.

4 MFAC Revisions

Overall, the non-point source MFAC/BMP Program is effective for addressing trash as none of the five monitoring sites met the criteria for increased BMP implementation (four consecutive months of Category 3 trash conditions). In addition, the current monthly non-point source MFAC monitoring schedule is appropriate for assessing trash conditions within the Revolon Slough and Beardsley Wash subwatershed. Any necessary revisions identified during the implementation of the 2016-2017 monitoring year will be proposed in the eighth-year monitoring annual report in December 2017.

In addition, the City of Camarillo's point source-specific MFAC/BMP Program is effective at addressing trash and the quarterly inspection and collection frequency is appropriate for assessing trash conditions within the City's portion of the Revolon Slough and Beardsley Wash subwatershed. Any necessary revisions identified during the implementation of the 2016-2017 monitoring year will be proposed in the eighth-year monitoring annual report in December 2017.

Appendix 1. Assessment Site Descriptions

Site 1 – Revolon Slough at Wood Road

This site consists of Revolon Slough and its adjacent land areas. It begins at the end of a concrete channel and includes the 100 foot downstream portion of Revolon Slough and the banks on both sides of the water body.

GPS Coordinates:

Lat: 34.169771

Lon: -119.095591



Site 3a – Camarillo Hills Drain Outlet

This site begins at the upstream end of a drain outlet and includes the in-stream portions of the Camarillo Hills Drain and the banks on either side of the drain.

GPS Coordinates:

Lat: 34.215486

Lon: -119.076388



Site 5 – Revolon Slough at Etting Road

This site begins at the downstream end of an agricultural drain that discharges into Revolon Slough and includes the in-stream portions of Revolon Slough as well as the land areas within the slough and the banks.

GPS Coordinates:

Lat: 34.161731

Lon: -119.091460



Site 8 – Caltrans Site on U.S. 101 Freeway

This site is located on the south side of U.S. 101 Freeway near Revolon Slough. The site begins at the end of the guard rail and ends at the fence surrounding Revolon Slough.

GPS Coordinates:

Lat: 34.221799

Lon: -119.120400

**Site 10 – 5th Street Drain at Del Norte Blvd.**

This site is located within the 5th Street Drain near the intersection of Del Norte Boulevard and 5th Street. This site was added to the MFAC Program in July 2015.

GPS Coordinates:

Lat: 34.191006

Lon: -119.107392



Appendix 2. Example MFAC Event Photos

Site 1 – Revolon Slough at Wood Road



Figure 1: Site 1 before a MFAC Event in October, 2015



Figure 2: Site 1 after a MFAC Event in October, 2015

Site 3a – Camarillo Hills Drain Outlet



Figure 3: Site 3a before a MFAC Event in October, 2015



Figure 4: Site 3a after a MFAC Event in October, 2015

Site 5 – Revolon Slough at Etting Road



Figure 5: Site 5 before a MFAC Event in October, 2015



Figure 6: Site 5 after a MFAC Event in October, 2015

Site 8 – Caltrans Site on U.S. 101 Freeway



Figure 7: Site 8 before a MFAC Event in October, 2015



Figure 8: Site 8 after a MFAC Event in October, 2015

Site 10 – Revolon Slough at Del Norte Blvd.



Figure 9. Site 10 before a MFAC Event in October, 2015



Figure 10. Site 10 before a MFAC Event in October, 2015

Appendix 3. Example Special Cleanup Photos

Site 1 – Revolon Slough at Wood Road



Figure 1: Site 1 before a Special Cleanup Event in April, 2016

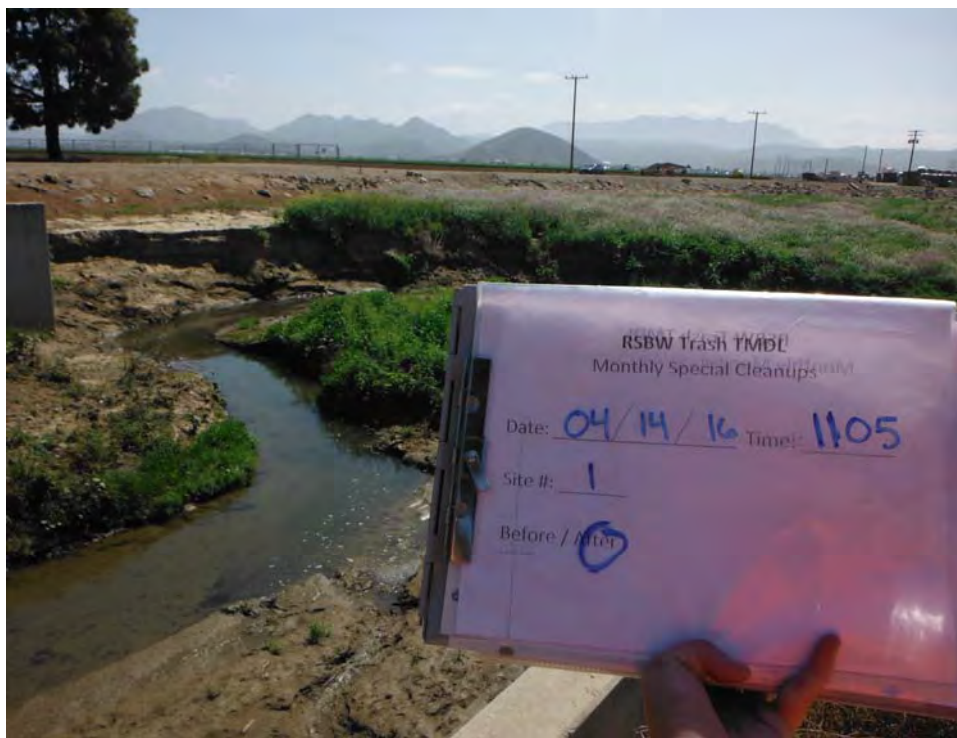


Figure 2: Site 1 after a Special Cleanup Event in April, 2016

Site 3a-Camarillo Hills Drain Outlet



Figure 3: Site 3a before a Special Cleanup Event in April, 2016

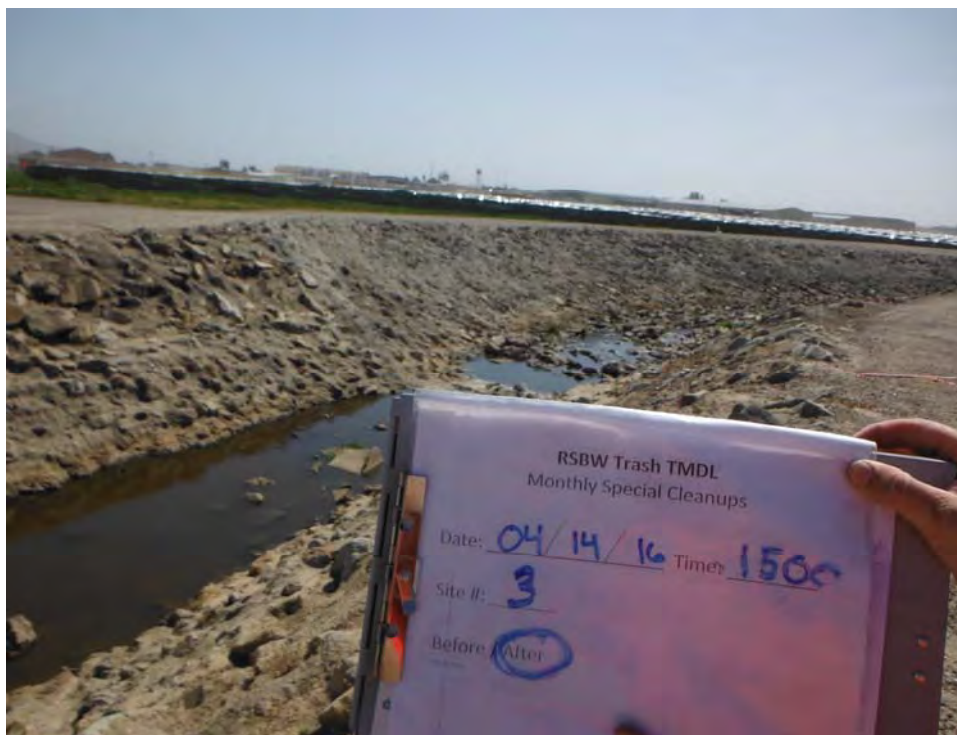


Figure 4: Site 3a after a Special Cleanup Event in April, 2016

Site 5 – Revolon Slough at Etting Road



Figure 5: Site 5 before a Special Cleanup Event in April, 2016



Figure 6: Site 5 after a Special Cleanup Event in April, 2016

Site 8 – Caltrans Site on U.S. 101 Freeway



Figure 7: Site 8 before a Special Cleanup Event in April, 2016



Figure 8: Site 8 after a Special Cleanup Event in April, 2016

Site 10 – Revolon Slough at Del Norte Blvd.



Figure 9. Site 10 before a Special Cleanup Event in April, 2016



Figure 10. Site 10 after a Special Cleanup Event in April, 2016

Appendix 4. County of Ventura Full Capture Connector Pipe Screen Trash Excluder Certification Report

**REVOLON SLOUGH/BEARDSLEY WASH TRASH TMDL
FULL CAPTURE CONNECTOR PIPE SCREEN TRASH EXCLUDER
CERTIFICATION REPORT**

**100% Full Trash Capture Compliance within
County Unincorporated Areas in Revolon Slough/Beardsley Wash Subwatersheds**

Prepared By:



Ventura County Public Works Agency

800 S. Victoria Avenue
Ventura, CA 93009-1600

December 2016

**REVOLON SLOUGH/BEARDSLEY WASH TRASH TMDL
FULL CAPTURE CONNECTOR PIPE SCREEN TRASH EXCLUDER
CERTIFICATION REPORT**

Prepared By:

David Laak, Water Quality Planner
Ventura County Watershed Protection District

Reviewed By:

Ewelina Mutkowska, Engineering Manager
David Kirby, Water Quality Engineer

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Appendix A Detailed Maps and Drainage Areas

Appendix B Installation Photos

Appendix C As-Built Drawings

Background

The purpose of this report is to document the installation and certification of 54 adequately sized and maintained connector pipe screen (CPS) 100% full capture trash excluders and 2 custom sized Detention Basin standpipe 5 mm screens for all Ventura County Unincorporated (County) areas draining to the County's MS4 within the Revolon Slough/Beardsley Wash (RSBW) watershed as part of the Point Source requirements of the Revolon Slough and Beardsley Wash Trash TMDL (Los Angeles Regional Water Quality Control Board Resolution No. R4-2007-007).

The Los Angeles Regional Water Quality Control Board (LARWQCB) adopted the definition of "full capture system" for the Ballona Creek Trash Total Maximum Daily Load (TMDL) per Resolution No. 04-023 on March 4, 2004. This definition is considered applicable for all receiving waters in the Los Angeles Region identified as being impaired for trash. The definition is as follows:

"A full capture system is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate (Q) resulting from a one-year, one-hour, storm in the subdrainage area. Rational equation is used to compute the peak flow rate: $Q = C \times I \times A$, where Q = design flow rate (cubic feet per second, cfs); C = runoff coefficient (dimensionless); I = design rainfall intensity (inches per hour, as determined per the rainfall isohyetal map), and A = subdrainage area (acres)."

On August 1, 2007 the Los Angeles County Division of Public Works (LACDPW) received full capture certification from the LARWQCB for semi-circular connector pipe screens that were the basis of the submitted technical report "Connector Pipe Screen Design, Full Capture TMDL Compliance, Screen and Bypass Sizing Requirements (LACDPW Technical Report)," dated April 2007. Following the guidelines of the technical report, the County of Ventura hired contractors to design, manufacture and install these types of devices in the RSBW Watershed, in order to claim full capture credit towards the Trash TMDL requirements. The Stormtek and United Storm Water Inc., CPS devices installed within RSBW are certified for 100% trash capture per LACDPW Technical Report requirements.

In Fall 2014, 8 County owned and maintained catch basins were retrofitted with Stormtek CPS devices with 5 mm mesh screen designed to provide 100% capture of trash within their respective drainage areas. All devices were installed on the downstream connector pipe at strategic locations within their respective drainage areas to ensure 100% full trash capture for the areas draining to these devices.

During Summer 2015, the County hired Stantec Consulting Services, Inc. to perform a site suitability analysis study of both land use and the storm drain system to determine County owned catch basins requiring installation of full capture devices. This analysis included field reconnaissance findings with key information pertaining to physical measurements, photos, and field sketches, in addition to required drainage area delineation and hydrology calculations. Based on this site suitability analysis and additional field investigations and desktop analysis performed by County staff, in Fall 2016 48 additional County owned and maintained catch basin inlets were installed with custom designed and fabricated CPS devices from United Storm Water Inc. in addition to installation at two locations of 5 mm custom CPS screens on existing Ventura County Watershed Protection District (VCWPD) detention basin standpipes. In October 2016 it was discovered that the City of Oxnard had annexed a small roadway portion on Almond Drive in the Nyeland Acres community to become part of the City of Oxnard. 2 CPS devices were installed within this newly annexed area and will be transferred to the City of Oxnard for ownership and maintenance.

Potential Point Sources and Responsible Jurisdiction

The Trash Total Maximum Daily Load For Revolon Slough and Beardsley Wash in the Calleguas Creek Watershed Staff Report defines the Revolon Slough starting "... as Beardsley Wash at the Camarillo Hills...becomes Revolon Slough in the Oxnard Plain... Revolon Slough flows into Mugu Lagoon in a channel that runs parallel to Calleguas Creek near Pacific Coast Highway". **Figure 1** depicts the extent of the Revolon Slough Subwatershed and the County of Ventura Unincorporated Urban Infill areas and the Camarillo Airport properties, which are owned by the County of Ventura.

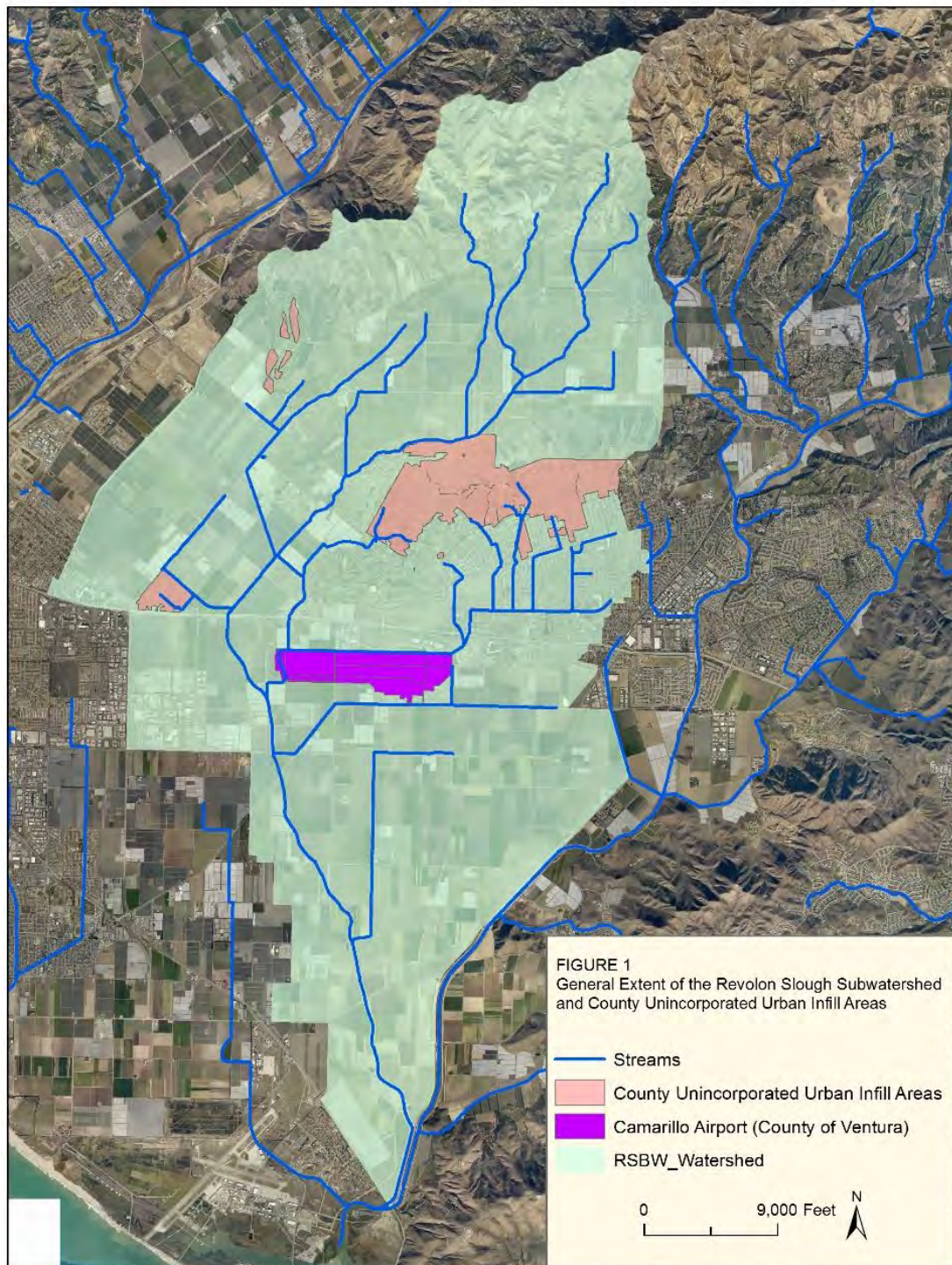


Figure 1 –Extent of the Revolon Slough Subwatershed, County Unincorporated Infill Areas and Camarillo Airport

The County’s MS4 storm drain network that is within the RSBW Subwatershed was analyzed to identify the catch basin locations requiring CPS installations. Each catch basin location was also evaluated for feasibility of installation of CPS devices based on its dimensions, inlet type and existing storm drain infrastructure. The locations of the installations represent 100% trash capture for all County MS4 drainage areas within the subwatershed to catch basins that are feasible for CPS device installation. The VCWPD owned Ramona and Las Posas Estates Detention Basins were identified as ideal locations for 5-mm mesh screen installation on their basin standpipes due to the large drainage area to each basin. For the Camarillo Airport area, the secured runway and hangar area is covered under the State’s Industrial

General Permit (IGP). As such, enhanced stormwater BMP's, including trash capture and frequent street/runway cleaning are implemented within this area per IGP and FAA safety requirements. The MS4 system outside of this IGP area was analyzed for full capture device requirements. **Figure 2** shows an overview of the County's MS4 within the RSBW Subwatershed with the locations of the installed CPS devices.

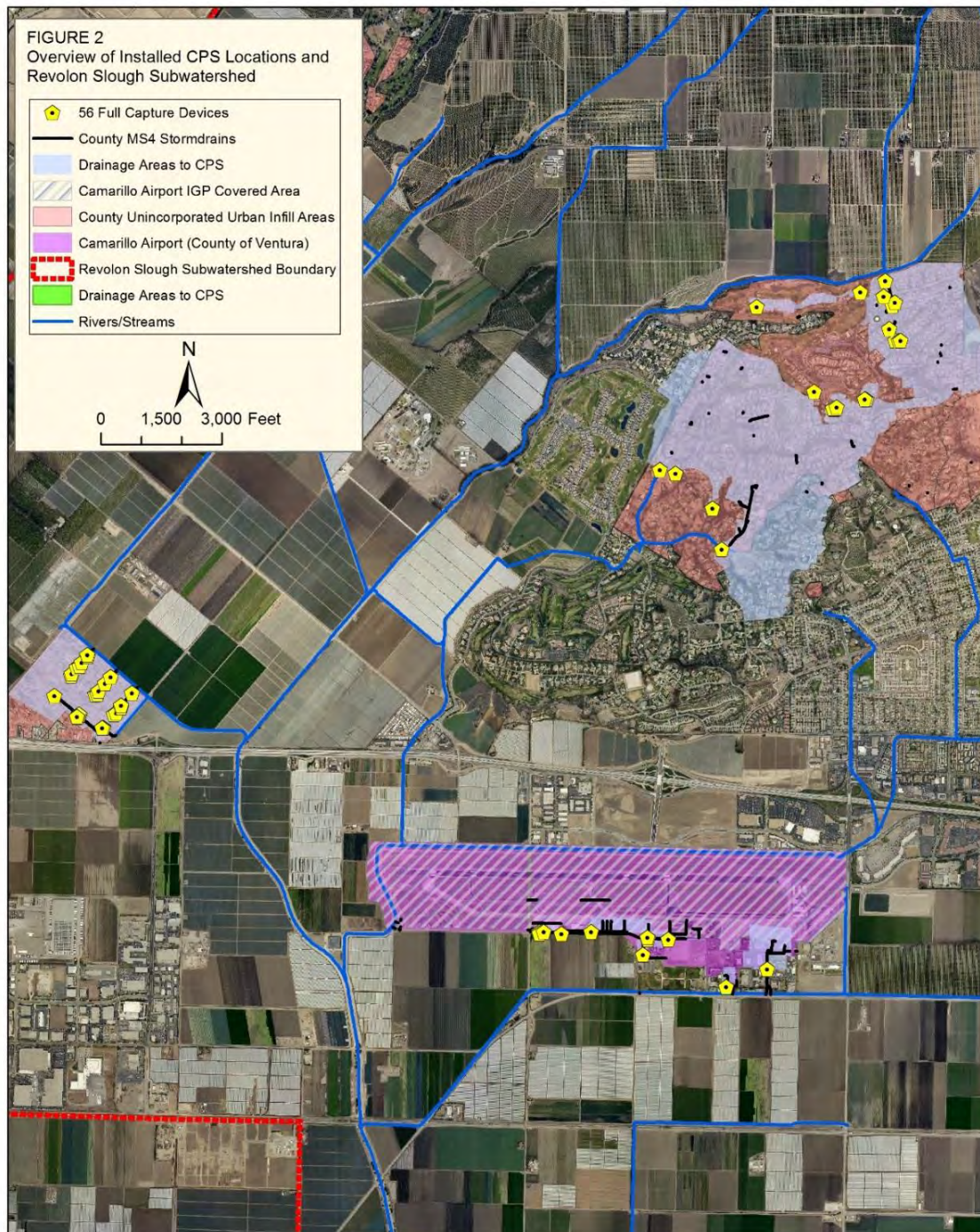


Figure 2 – Overview of Installed CPS Locations within Revolon Slough Subwatershed

CPS Device Trash Excluder Locations

Figures 3, 4 and 5 show detailed maps of the County MS4 and the installed CPS devices with their drainage areas. **Appendix A** contains more detailed maps of each retrofitted catch basin and their drainage areas. **Appendix B** contains photos of the installed for each of the locations using their unique device identification number. The installed devices As-built drawings can be found in **Appendix D**.

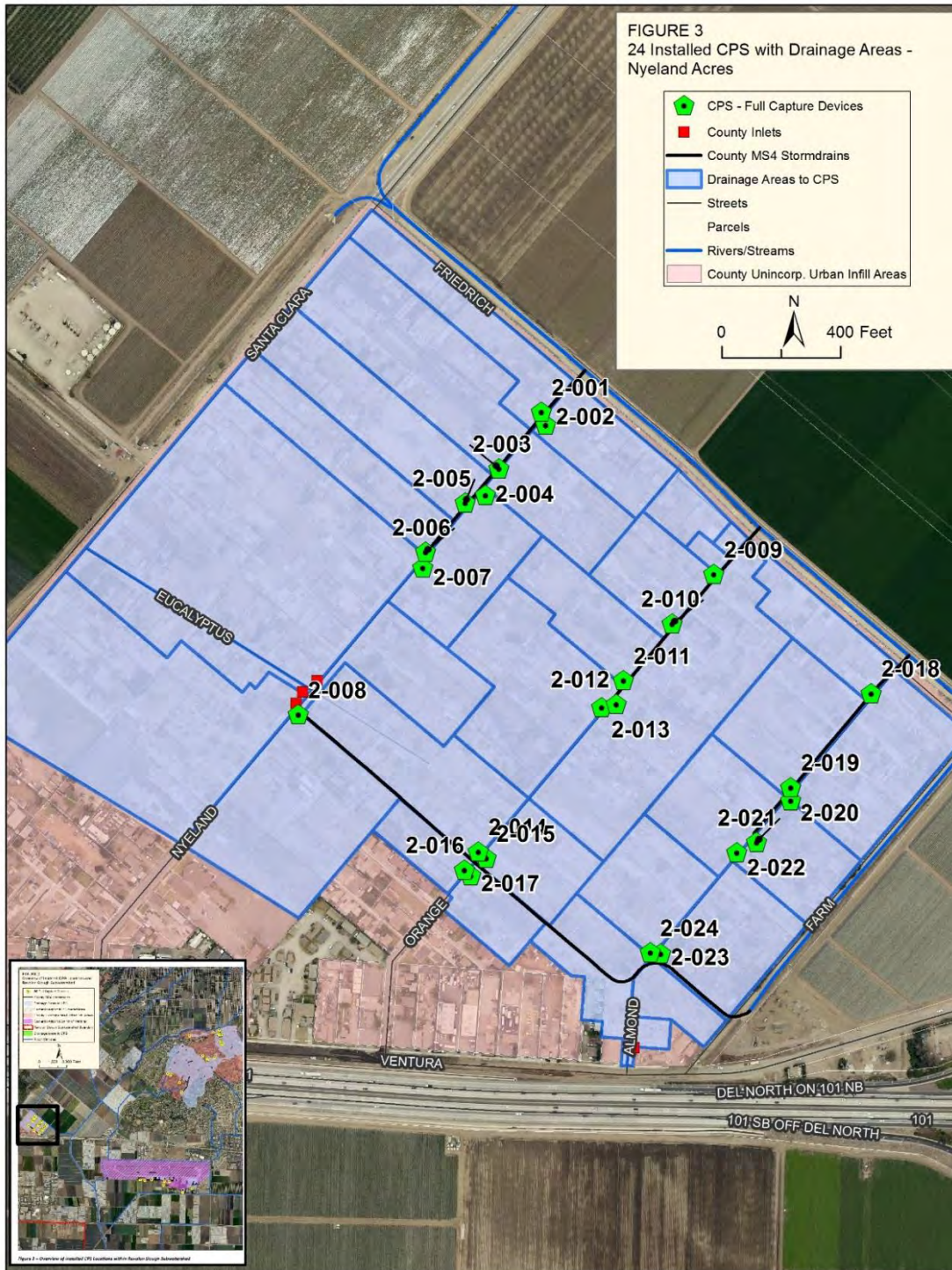


Figure 3 – 24 Installed CPS with Drainage Areas – Nyeland Acres

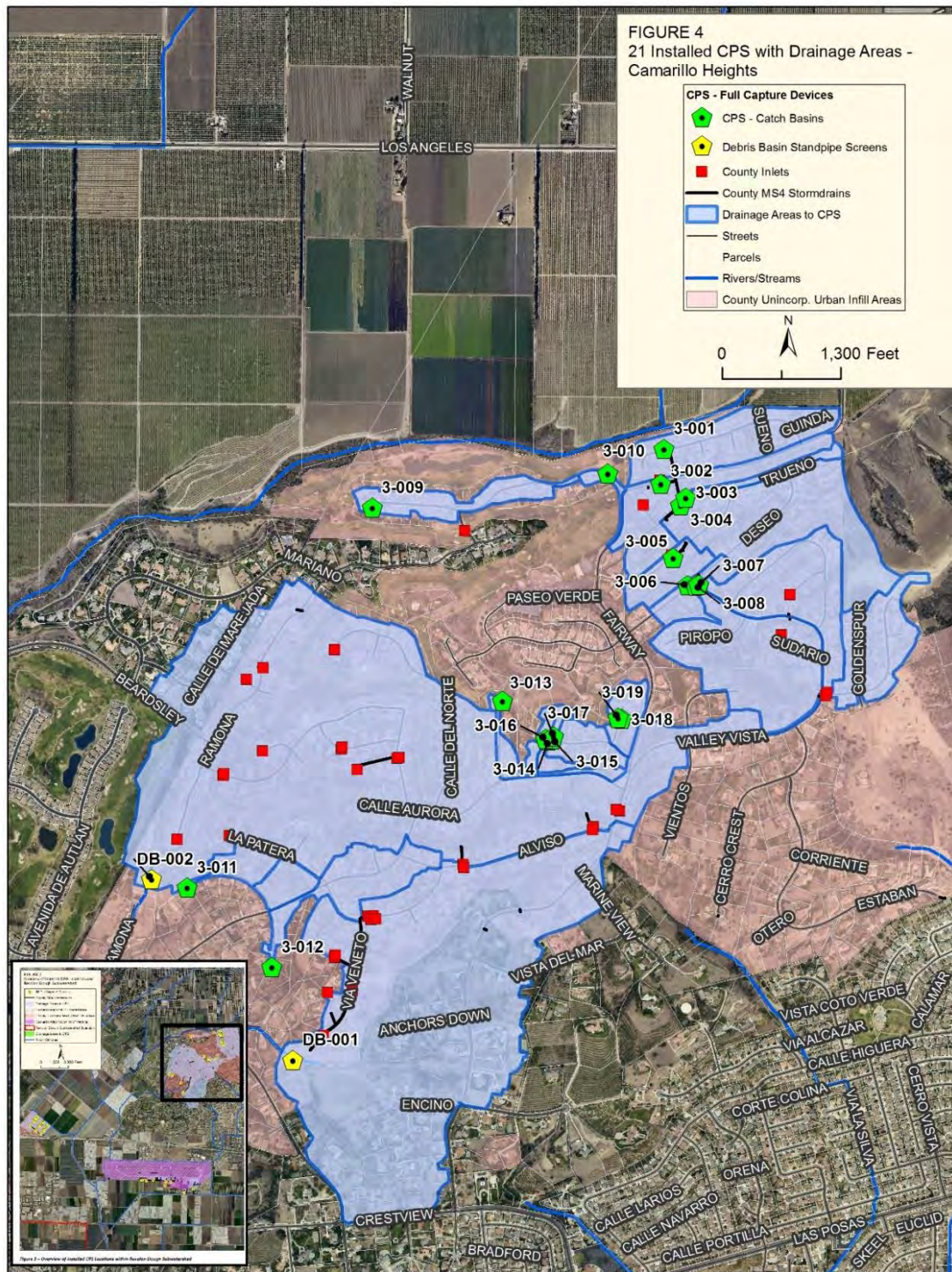


Figure 4 - 21 Installed CPS with Drainage Areas – Camarillo Heights

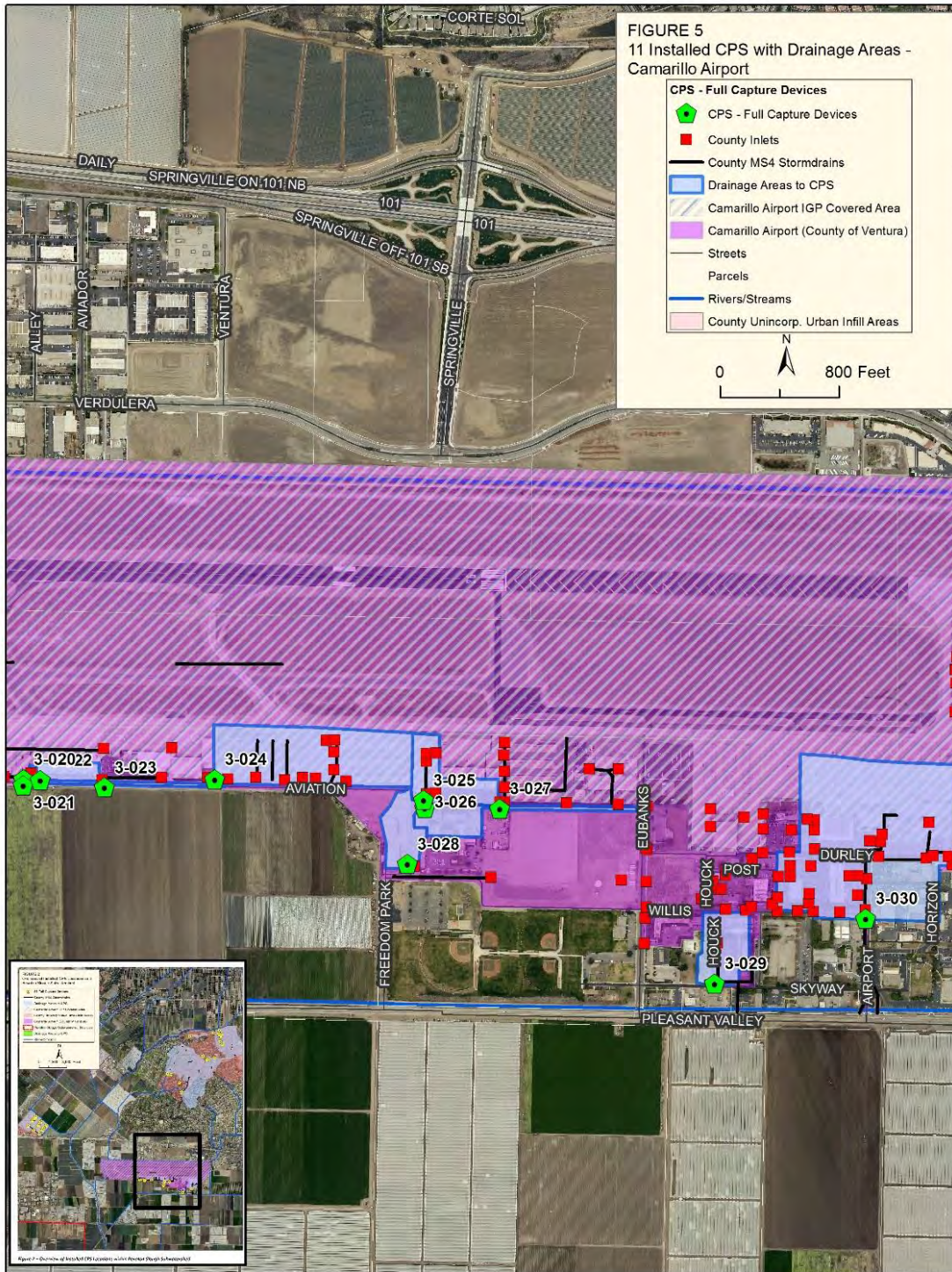


Figure 5 - 11 Installed CPS with Drainage Areas – Camarillo Airport

Each of the CPS devices will be inspected and maintained by responsible personnel in accordance with the 'Connector Pipe Screen (CPS) Trash Excluders – Operation and Maintenance Plans' (O&M Plans) which are currently under review and approval by the involved County Departments.

Design Hydrology

In Fall 2014, 8 County owned and maintained catch basins were retrofitted with Stormtek CPS devices with 5 mm mesh screen designed to provide 100% capture of trash within their respective drainage areas. Stantec Consulting Services, Inc. was hired in Summer 2015 to perform a complete site suitability analysis study of both land use and the storm drain system to determine additional County owned catch basins requiring installation of full capture devices within RSBW. This analysis included field reconnaissance findings with key information pertaining to physical measurements, photos, and field sketches, in addition to required drainage area delineation and hydrology calculations. Since the majority of Ventura County drainage facilities are designed for a 10-yr design storm frequency (Q_{10}), the calculations in this report for the sizing of the CPS devices are for a catch basin designed with a 10-year storm frequency. The VCWPD hydrology section provided guidance on two different recommended hydrologic calculations methods to determine flow rates to each catch basin in addition to providing two different methods for the CPS device 1-yr/1hr treatment flow. The methods utilized within the RSBW watershed are discussed below and provide larger flow rates, and therefore more conservative values. Below is a discussion of the hydrology calculations used to determine the 1-yr/1-hr design flow (for CPS device treatment flow to attain full capture requirements), and the 10-yr/24-hr design flow for the catch basin itself.

Calculation of 1-Yr/1-Hr Design Flow and 10-Yr/24-hr Design Flow

Guidance on acceptable analysis methods were provided by the VCWPD Hydrology Section. Mark Bandurraga, Design Hydrologist with VCWPD provided information and assistance regarding the existing VCRat model of the Revolon watershed and 1-yr/1-hr rainfall data. The following procedure was used for determining the design flow for the 1-yr/1-hr storm within the RSBW watershed:

- The Rational Equation Method ($Q = CIA$) was used to determine the runoff generated from the tributary area “A” of each inlet analyzed.
 - The “C” coefficients were determined from the Ventura County Technical Guidance Manual (TGM).
 - The equation for coefficient “C” = $0.95 * imp + C_p (1-imp)$.
 - “C_p” values are based on the Ventura Soil Type
 - (Soil Number 1 – 7) and are depicted on Table 2-3 of the TGM.

Table 2-3: Ventura Soil Type Pervious Runoff Coefficients

Ventura Soil Type (Soil Number)	C _p value
1	0.15
2	0.10
3	0.10
4	0.05
5	0.05
6	0
7	0

- Intensity “I” values were determined using the Precipitation Frequency Data Server on NOAA’s Hydrometeorological Design Studies Center website <http://hdsc.nws.noaa.gov/hdsc/pfds/>.
 - The latitude and longitude of each inlet location was entered on the website.
 - A site specific table of the precipitation frequency estimates for the 1-yr/1-hr storm event were provide for each location.

- The tributary areas for the inlets analyzed in the RSBW watersheds were provided by the County, with additional analyses conducted using a topographic map from LIDAR data, Google Earth Pro, and field investigation information. Drainage areas were delineated for each catch basin with a CPS device installed. See **Figures 3 & 4** – Installed CPS Devices and Drainage Areas.

The 10-yr/24-hr design flow analysis utilizes the results from a revised version of the Revolon model. The following summarizes the procedure for this storm scenario for the RSBW watershed:

- The 100-yr Tc's in the model are revised according to the County's general rules to reflect 10-yr conditions.
 - Table - 2 of the Moon Ditch Watershed Design Hydrology Update Final Report (dated January 2015) was referenced in converting the 100-yr Tc to the 10-yr Tc.
 - The percent imperviousness, soil numbers, and time of concentration for the nodes depicted in the table varied.
 - However, the ratio between the 100-yr Tc and the 10-yr Tc were consistently around the low 60% to the mid-70% range.
 - Using an average Tc value from the nodes depicted in Table – 2, a multiplier was determined for use in converting the 100-yr Tc in the Revolon model to an equivalent 10-yr Tc.
- The model was then rerun using those Tc's and the K10 rainfall distribution.
 - The results were pro-rated to determine the runoff of the tributary area for each catch basin analyzed.
 - The results of the design flows for both storm events are included in **Tables 1 & 2**.

RSBW - Calculation of Detention Basin Design Peak Flow, Volume, and Water Surface Elevation

Utilizing the VCWPD record drawings of the basins, the VCWPD Debris Basin Report (dated September, 2005) for reference, and the previously mentioned existing VCRat model of the Revolon watershed modified to reference the 1-yr /1-hr rainfall data. The basin routing results from the model was used to determine the design peak flow, volume, and water surface elevation for the Las Posas Estates Detention Basin and the Ramona Detention Dam.

- The Stage-Discharge Curves and Area-Capacity Curves from the VCWPD Debris Basin Report were used to create stage-storage-discharge curves for the reservoir routing of the Las Posas Estates and Ramona basins.
 - The report also provided the emergency spillway elevations and top of dam elevations.
- For the 1-yr/1-hr scenario, the VCRat model uses the intensity data from the vcrain.dat file that the County provided. The vcrain.dat file was renamed to vcrain_1-yr.dat. The rain curve used in the run was changed to the L10. A single curve was created using a value of 0.493 in/hr.
 - The Revolon Model Node ID for the Las Posas Estates Detention Basin is 5173D.
 - Finish Grade – Bleeder Pipe: 151.00'
 - Water Surface Elevation (WSE) Increase: +1.3'
 - Water Surface Elevation: 152.3 ft
 - Design Peak Flow: 29.44 cfs
 - Volume: 1.87 ac-ft (81,457 cu-ft)
 - The Revolon Model Node ID for the Ramona Detention Dam is 5166B.
 - Finish Grade – Bleeder Pipe: 149.00'
 - Water Surface Elevation (WSE) Increase: +4.85'
 - Water Surface Elevation: 153.85 ft

- Design Peak Flow: 55.08 cfs
- Volume: 4.35 ac-ft (189,486 cu-ft)
- Due to a reduction in volume, fattening of the hydrograph was removed for this storm scenario.
- For the 10-yr/24-hr scenario, the Revolon model was rerun using the 10-yr Tc values previously discussed. The reservoir routing provides values of the incoming hydrograph peak flows, the maximum elevation (stage) attained in the basin, and the corresponding volume (storage) at that elevation.
 - The Revolon Model Node ID for the Las Posas Estates Detention Basin is 5173D.
 - Design Peak Flow: 264.14 cfs
 - Water Surface Elevation: 163.97 ft
 - Volume: 12.46 ac-ft (542,758 cu-ft)
 - The Revolon Model Node ID for the Ramona Detention Dam is 5166B.
 - Design Peak Flow: 330.30 cfs
 - Water Surface Elevation: 165.12 ft
 - Volume: 18.68 ac-ft (813,701 cu-ft)

From the hydrologic analysis and calculated water surface elevation, it was determined that only the bleeder pipes located at each basin required the 5mm screen retrofit and neither of the intake towers required screens.

Table 1 – Q₁₋₁ Hydrology Peak Flow Rates and Parameters

Table 1: 1-Yr/1-Hr Design Flow Analysis (NOAA Intensity with TGM "C" Coefficients)

Device ID	Revolon Subarea No.	Area (acres)	Soil No.	% Imp (Effective)	% Imp (Average)	Cp	C	Intensity (in/hr)	Tributary Area (acres)	Q1 Design Flow (cfs)
2-001	5379	62	3	0.23	0.47	0.10	0.50	0.510	2.76	0.70
2-002	5379	62	3	0.23	0.47	0.10	0.50	0.510	2.33	0.59
2-003	5379	62	3	0.23	0.47	0.10	0.50	0.510	5.78	1.47
2-004	5379	62	3	0.23	0.47	0.10	0.50	0.510	2.60	0.66
2-005	5379	62	3	0.23	0.47	0.10	0.50	0.510	4.08	1.04
2-006	5379	62	3	0.23	0.47	0.10	0.50	0.510	3.08	0.78
2-007	5379	62	3	0.23	0.47	0.10	0.50	0.510	2.95	0.75
2-008	5387	59	3	0.23	0.47	0.10	0.50	0.510	8.79	2.24
2-009	5379	62	3	0.23	0.47	0.10	0.50	0.510	0.23	0.06
2-010	5379	62	3	0.23	0.47	0.10	0.50	0.510	2.13	0.54
2-011	5379	62	3	0.23	0.47	0.10	0.50	0.510	2.44	0.62
2-012	5379	62	3	0.23	0.47	0.10	0.50	0.510	7.89	2.01
2-013	5379	62	3	0.23	0.47	0.10	0.50	0.510	5.20	1.33
2-014	5387	59	3	0.23	0.47	0.10	0.50	0.510	4.38	1.12
2-015	5387	59	3	0.23	0.47	0.10	0.50	0.510	2.13	0.54
2-016	5387	59	3	0.23	0.47	0.10	0.50	0.510	1.06	0.27
2-017	5387	59	3	0.23	0.47	0.10	0.50	0.510	1.35	0.34

Device ID	Revolon Subarea No.	Area (acres)	Soil No.	% Imp (Effective)	% Imp (Average)	Cp	C	Intensity (in/hr)	Tributary Area (acres)	Q1 Design Flow (cfs)
2-018	5379	62	3	0.23	0.47	0.10	0.50	0.504	2.00	0.50
2-019	5379	62	3	0.23	0.47	0.10	0.50	0.510	3.20	0.81
2-020	5379	62	3	0.23	0.47	0.10	0.50	0.510	4.26	1.09
2-021	5379	62	3	0.23	0.47	0.10	0.50	0.510	2.13	0.54
2-022	5379	62	3	0.23	0.47	0.10	0.50	0.510	2.66	0.68
2-023	5387	59	3	0.23	0.47	0.10	0.50	0.510	3.19	0.81
2-024	5387	59	3	0.23	0.47	0.10	0.50	0.510	2.66	0.68
3-001	5110	81	1	0.13	0.25	0.15	0.35	0.509	23.80	4.24
3-002	5110	81	1	0.13	0.25	0.15	0.35	0.509	17.70	3.15
3-003	5110	81	1	0.13	0.25	0.15	0.35	0.509	3.40	0.61
3-004	5110	81	1	0.13	0.25	0.15	0.35	0.509	42.10	7.50
3-005	5109	57	1	0.15	0.30	0.15	0.39	0.509	8.10	1.61
3-006	5109	57	1	0.15	0.30	0.15	0.39	0.509	6.30	1.25
3-007	5109	57	1	0.15	0.30	0.15	0.39	0.509	27.00	5.36
3-008	5109	57	1	0.15	0.30	0.15	0.39	0.509	56.20	11.16
3-009	5120	39	1	0.10	0.20	0.15	0.31	0.512	12.41	1.97
3-010	5116	48	3	0.04	0.08	0.10	0.17	0.509	1.60	0.14
3-011	5168	52	2	0.15	0.30	0.10	0.36	0.500	5.96	1.06
3-012	5176	39	2	0.15	0.30	0.10	0.36	0.500	17.52	3.11
3-013	5117	41	1	0.10	0.20	0.15	0.31	0.512	4.72	0.75
3-014	5117	41	1	0.10	0.20	0.15	0.31	0.512	3.09	0.49
3-015	5117	41	1	0.10	0.20	0.15	0.31	0.512	4.05	0.64
3-016	5117	41	1	0.10	0.20	0.15	0.31	0.512	2.06	0.33
3-017	5117	41	1	0.10	0.20	0.15	0.31	0.512	2.73	0.43
3-018	5117	41	1	0.10	0.20	0.15	0.31	0.512	4.46	0.71
3-019	5117	41	1	0.10	0.20	0.15	0.31	0.512	1.36	0.22
3-020	5702	21	3	0.30	0.60	0.10	0.61	0.467	0.15	0.04
3-021	5702	21	3	0.30	0.60	0.10	0.61	0.467	0.29	0.08
3-022	5702	21	3	0.30	0.60	0.10	0.61	0.467	1.22	0.35
3-023	5702	21	3	0.30	0.60	0.10	0.61	0.467	0.43	0.12
3-024	5702	21	3	0.30	0.60	0.10	0.61	0.467	11.88	3.38
3-025	5697	86	3	0.20	0.40	0.10	0.44	0.454	0.62	0.12
3-026	5697	86	3	0.20	0.40	0.10	0.44	0.454	3.55	0.71
3-027	5697	86	3	0.20	0.40	0.10	0.44	0.454	2.18	0.43
3-028	5697	86	3	0.20	0.40	0.10	0.44	0.454	2.64	0.53
3-029	5694	55	3	0.40	0.76	0.10	0.75	0.454	3.12	1.06
3-030	5693	55	3	0.15	0.30	0.10	0.36	0.449	22.90	3.65
DB-001	Las Posas	168	1	0.15	0.30	0.15	0.39	0.486	191.24	36.25
DB-002	Ramona	254	1	0.15	0.30	0.15	0.39	0.500	257.09	50.13

Table 2 – Q₁₀₋₂₄ Hydrology Peak Flow Rates and Parameters

Table 2: 10-Yr/24-Hr Design Flow Analysis

Device ID	Revolon Subarea No.	Area (acres)	S o i l N o.	% Imp	Q100 Tc (min)	Q100 (cfs)	10-yr Tc Ratio	Q10 Tc (min)	Q10 (cfs)	cfs/acre	Tributary Area (acres)	Q10 Design Flow (cfs)
2-001	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.76	3.12
2-002	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.33	2.63
2-003	5379	62	3	0.23	17	135	1.5479	26	70	1.13	5.78	6.52
2-004	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.60	2.94
2-005	5379	62	3	0.23	17	135	1.5479	26	70	1.13	4.08	4.61
2-006	5379	62	3	0.23	17	135	1.5479	26	70	1.13	3.08	3.47
2-007	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.95	3.33
2-008	5387	59	3	0.23	16	133	1.5479	25	68	1.15	8.79	10.13
2-009	5379	62	3	0.23	17	135	1.5479	26	70	1.13	0.23	0.26
2-010	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.13	2.41
2-011	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.44	2.75
2-012	5379	62	3	0.23	17	135	1.5479	26	70	1.13	7.89	8.91
2-013	5379	62	3	0.23	17	135	1.5479	26	70	1.13	5.20	5.87
2-014	5387	59	3	0.23	16	133	1.5479	25	68	1.15	4.38	5.05
2-015	5387	59	3	0.23	16	133	1.5479	25	68	1.15	2.13	2.46
2-016	5387	59	3	0.23	16	133	1.5479	25	68	1.15	1.06	1.23
2-017	5387	59	3	0.23	16	133	1.5479	25	68	1.15	1.35	1.55
2-018	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.00	2.26
2-019	5379	62	3	0.23	17	135	1.5479	26	70	1.13	3.20	3.61
2-020	5379	62	3	0.23	17	135	1.5479	26	70	1.13	4.26	4.81
2-021	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.13	2.40
2-022	5379	62	3	0.23	17	135	1.5479	26	70	1.13	2.66	3.00
2-023	5387	59	3	0.23	16	133	1.5479	25	68	1.15	3.19	3.68
2-024	5387	59	3	0.23	16	133	1.5479	25	68	1.15	2.66	3.07
3-001	5110	81	1	0.13	12	163	1.5479	19	125	1.54	23.80	36.73
3-002	5110	81	1	0.13	12	163	1.5479	19	125	1.54	17.70	27.31
3-003	5110	81	1	0.13	12	163	1.5479	19	125	1.54	3.40	5.25
3-004	5110	81	1	0.13	12	163	1.5479	19	125	1.54	42.10	64.97
3-005	5109	57	1	0.15	10	128	1.5479	15	101	1.77	8.10	14.35
3-006	5109	57	1	0.15	10	128	1.5479	15	101	1.77	6.30	11.16
3-007	5109	57	1	0.15	10	128	1.5479	15	101	1.77	27.00	47.84
3-008	5109	57	1	0.15	10	128	1.5479	15	101	1.77	56.20	99.58
3-009	5120	39	1	0.10	9	135	1.5479	14	72	1.85	12.41	22.91
3-010	5116	48	3	0.04	12	123	1.5479	19	61	1.27	1.60	2.03
3-011	5168	52	2	0.15	12	144	1.5479	19	73	1.40	5.96	8.37
3-012	5176	39	2	0.15	8	135	1.5479	12	72	1.85	17.52	32.34
3-013	5117	41	1	0.10	8	150	1.5479	12	82	2.00	4.72	9.44
3-014	5117	41	1	0.10	8	150	1.5479	12	82	2.00	3.09	6.18
3-015	5117	41	1	0.10	8	150	1.5479	12	82	2.00	4.05	8.10
3-016	5117	41	1	0.10	8	150	1.5479	12	82	2.00	2.06	4.12
3-017	5117	41	1	0.10	8	150	1.5479	12	82	2.00	2.73	5.46
3-018	5117	41	1	0.10	8	150	1.5479	12	82	2.00	4.46	8.92
3-019	5117	41	1	0.10	8	150	1.5479	12	82	2.00	1.36	2.72
3-020	5702	21	3	0.30	18	45	1.5479	28	23	1.10	0.15	0.17
3-021	5702	21	3	0.30	18	45	1.5479	28	23	1.10	0.29	0.31

Device ID	Revolon Subarea No.	Area (acres)	Soil No.	% Imp	Q100 Tc (min)	Q100 (cfs)	10-yr Tc Ratio	Q10 Tc (min)	Q10 (cfs)	cfs/acre	Tributary Area (acres)	Q10 Design Flow (cfs)
3-022	5702	21	3	0.30	18	45	1.5479	28	23	1.10	1.22	1.34
3-023	5702	21	3	0.30	18	45	1.5479	28	23	1.10	0.43	0.48
3-024	5702	21	3	0.30	18	45	1.5479	28	23	1.10	11.88	13.07
3-025	5697	86	3	0.20	19	173	1.5479	29	90	1.05	0.62	0.65
3-026	5697	86	3	0.20	19	173	1.5479	29	90	1.05	3.55	3.73
3-027	5697	86	3	0.20	19	173	1.5479	29	90	1.05	2.18	2.29
3-028	5697	86	3	0.20	19	173	1.5479	29	90	1.05	2.64	2.77
3-029	5694	55	3	0.40	12	152	1.5479	19	79	1.44	3.12	4.49
3-030	5693	55	3	0.15	15	127	1.5479	23	64	1.16	22.90	26.64
DB-001	Las Posas	168				495	1.5479		264	1.57	191.24	300.52
DB-002	Ramona	254				602	1.5479		330	1.30	257.09	334.01

For all devices, the contractor sized the screens, their diameter or length and height and the vertical opening around the perimeter at the top of the screen for each device according to the recommended calculations and dimensions as shown in the LACDPW Technical Report. Each unit was custom designed and constructed for the catch basin based on its dimensions, outflow pipe and modeled flow rates. **Table 3** lists the catch basin dimensions, installed CPS dimensions, and the LACDPW Technical Report minimum sizes and design screen capacities.

Hydraulic Analysis

A conservative estimate of catch basin flows based on curb openings widths must be determined in order to calculate the Q_{1-1} . The bypass structure must also be able to pass the maximum catch basin flow in order to provide proper flood protection. The LACDPW Technical Report was used for guidance in this analysis. The table in the Appendix of the LACDPW Technical Report was used to define the minimum screen capacity and minimum screen surface area for each catch basin. The catch basins were categorized as either 1) CB 300 – Standard Catch Basin, 2) CB 301 Side Inlet with Grate Catch Basin, or 3) CB 303 Standard Grating Catch Basin. By using the table, the catch basin type and their dimensions as well as the installed CPS device dimensions, the minimum screen capacity (cfs) and minimum screen surface area (sq in) were compared to the installed device capacity and surface area. For those catch basins where the CPS device was installed underneath the catch basin opening, a lid was installed on top of the device to ensure trash coming in through the opening would not fall behind or bypass the CPS Device. For these locations, the bypass height in inches is shown. **Table 3** lists these values and dimensions.

Table 3 – Catch Basin/CPS Dimensions & Minimum Recommended Screen Size/Capacity

ID No.	Catch Basin Dimensions					Installed Insert Dimensions					LADPW Tech. Report Information				Calculated Flows
	CB Type	Depth (ft)	Width (ft)	Length (ft)	Outlet Dia (in)	Config*	Bypass (in)	Screen Height (in)	Screen Length (ft)	Screen Surface Area (sq in)	Min. Screen Height (in)**	Min. Screen Length (ft)**	Min. Screen Surface Area (sq in)	Min. Screen Capacity (cfs)**	Q1-1 (cfs)
2-001	300	5	3.15	10	18	S	12	20	7.5	1800	30	3.0	1080	5.0	0.70
2-002	300	4.6	3.4	3	18	L	12	20	3.6	860	24	1.1	317	1.5	0.59
2-003	300	4	3.15	10	18	L	12	20	7.5	1800	24	3.3	950	4.4	1.47
2-004	300	4.7	3.15	3.5	18	L	12	20	3.6	860	24	1.1	317	1.5	0.66
2-005	300	4	3.15	10	18	S	12	20	7.5	1800	24	3.3	950	4.4	1.04
2-006	300	4	3.15	10	18	L	12	24	6.0	1728	24	3.3	950	4.4	0.78
2-007	300	4.6	3.15	3.5	18	L	12	24	3.0	864	24	1.5	432	1.5	0.75
2-008	300	4	4.6	6.5	36	L	N/A	24	5.0	1440	24	2.9	835	3.8	2.24
2-009	300	3.8	4.3	3	18	T	N/A	18	3.1	666	24	1.5	432	2.0	0.06
2-010	300	3.2	4.4	3	18	T	N/A	18	3.1	666	18	1.5	324	1.5	0.54
2-011	300	3.6	4.5	3	18	L	N/A	18	3.1	666	18	1.5	324	1.5	0.62
2-012	300	4.3	3.5	3.4	18	L	N/A	18	3.0	648	24	1.1	317	1.5	2.01
2-013	300	4.8	3.4	3	18	L	N/A	24	3.1	888	30	1.1	396	1.8	1.33
2-014	300	3.45	4.5	4.5	24	T	12	16	4.0	768	18	1.5	324	1.5	1.12
2-015	300	4.18	4.5	4.5	24	T	12	18	3.0	648	24	1.5	432	2.0	0.54
2-016	300	3.3	4.5	3	24	T	12	18	3.0	648	18	1.5	324	1.5	0.27
2-017	300	3.8	4.5	3	24	T	12	18	4.0	864	24	1.5	432	2.0	0.34
2-018	300	3.3	4.5	3	18	L	N/A	18	3.1	666	18	1.5	324	1.5	0.50
2-019	300	4.35	4.5	3	18	L	N/A	20	3.3	780	24	1.1	317	2.0	0.81
2-020	300	3.8	4.5	3.6	18	L	N/A	20	3.6	860	24	1.5	432	2.0	1.09
2-021	300	3.6	4.5	3.5	18	L	N/A	18	3.1	666	18	1.5	324	1.5	0.54
2-022	300	3.5	4.6	3	18	L	N/A	18	3.1	666	18	1.5	324	1.5	0.68
2-023	300	4.2	4.6	3	24	T	N/A	24	3.3	960	24	1.5	432	2.0	0.81
2-024	300	3.44	4.5	3	24	T	12	24	2.9	840	18	1.5	324	1.5	0.68
3-001	301	4	4	10	24	SC	N/A	38	3.7	1672	24	3.4	979	4.5	4.24
3-002	301	4.17	4	7	28	SC	N/A	35	3.8	1575	24	3.3	950	3.3	3.15
3-003	301	5	4	14	24	SC	N/A	40	4.7	2240	30	3.5	1260	5.8	0.61
3-004	300	4.17	3.83	14	20	SC	N/A	30	4.8	1710	24	3.9	1123	5.1	7.50
3-005	301	4	3	7	16	SC	N/A	40	3.9	1880	24	3.3	950	4.4	1.61
3-006	301	3	3.83	10	18	SC	N/A	18	3.7	792	18	3.4	734	3.4	1.25
3-007	301	3.83	3.83	20	24	SC	N/A	30	3.7	1320	24	4.0	1152	5.3	5.36
3-008	301	3.83	4.17	20	24	SC	N/A	34	4.4	1802	24	4.0	1152	5.3	11.16
3-009	303	2.83	1.75	3.5	15	T	10	16	3.5	672	18	3.0	648	3.0	1.97
3-010	303	5	2	3.5	36	S	12	24	3.5	1008	30	3.0	1080	5.0	0.14
3-011	303	2.83	1.75	3.33	14	T	10	16	3.5	672	18	3.0	648	3.0	1.06
3-012	303	2.7	1.83	3.5	12	T	10	14	3.5	588	18	3.0	648	3.0	3.11
3-013	303	3.92	1.75	3.5	18	T	10	16	3.5	672	24	3.0	864	4.0	0.75
3-014	300	3.5	3	7	18	L	12	20	4.0	960	18	2.9	626	2.9	0.49
3-015	300	3	3	7	18	S	10	16	4.0	768	18	2.9	626	2.9	0.64
3-016	300	5.17	3	7	18	L	12	24	4.0	1152	30	2.1	756	3.5	0.33
3-017	300	6	3	7	18	L	12	24	4.0	1152	42	2.1	1058	4.9	0.43
3-018	300	3.92	3	10	18	L	12	18	6.0	1296	24	3.3	950	4.4	0.71
3-019	300	4.3	3	3.5	18	S	12	24	3.5	1008	24	1.1	317	1.5	0.22
3-020	300	3.5	7	3.2	18	T	12	20	3.1	740	18	1.5	324	1.5	0.04
3-021	300	3.6	3.5	3	12	S	12	20	3.5	840	18	1.5	324	1.5	0.08
3-022	303	3	3	3	18	S	10	16	2.9	560	18	1.5	324	1.5	0.35
3-023	300	4.66	3.5	3.5	18	S	12	24	3.6	1032	24	1.1	317	1.5	0.12
3-024	303	5.5	3	3	27	T	12	24	3.0	864	36	3.0	1296	6.0	3.38
3-025	300	3	3	3	18	T	8	10	3.0	360	18	1.5	324	1.5	0.12
3-026	300	3	3	3	18	S	10	18	3.0	648	18	1.5	324	1.5	0.71
3-027	300	4	3	3	18	T	12	24	3.0	864	24	1.5	432	2.0	0.43
3-028	300	3.5	3.5	3.5	18	T	N/A	24	3.0	864	18	1.5	324	1.5	0.53
3-029	303	2.4	2.5	2.5	15	S	10	16	2.7	512	18	3.0	648	3.0	1.06
3-030	303	5.75	3	3	24	S	11	22	2.5	660	36	3.0	1296	6.0	3.65

* Configuration: L = "L" Shaped, T=Triangle, S=Square, SC=Semi Circular

** Screen capacity and recommended screen dimensions from LADPW Tech. Report, 2007

As noted in the LACDPW Technical Report some combinations of V-depths, connector pipe sizes and catch basin dimensions made installation of standard sized CPS devices impossible. For Device ID's 2-012, 3-004, 3-008 and 3-012, the calculated Q_{1-1} is greater than minimum Q_{1-1} shown in the LACDPW Technical Report for a catch basin with similar V-depths and lengths. The total area and therefore treatment capacity of the screen is still adequate at these locations as can be seen in the comparison of the installed Screen Surface Area to the Minimum Screen Surface area from the LACDPW Technical Report. Device ID 3-012 has a V-depth of 2.7' and was compared to the minimum V-depth provided in the LACDPW Technical Report of 3.5'. With this difference in V-depth, this device has adequate surface screen area. Although the screen surface areas for Device ID's 3-010, 3-012, 3-024 and 3-030 was less than the recommended screen surface area from the LACDPW Technical Report, the screen capacity at these locations is adequate for the calculated flows. As shown in **Table 3**, all of the installed devices meet the performance criteria for full capture certification.

Connecting Pipe Flows

As stated in the August 3, 2004 LARWQCB Technical Memorandum – Procedures and Requirements for Certification of a Best Management Practice for Trash Control as a Full Capture System (Memo), the pipes carrying the flows from the subdrainage area should be able to handle peak flows. Full flow capacities using Manning's Equation were calculated for all connector pipes immediately downstream of the installed full capture devices. Slopes for the downstream connector pipes were estimated at 0.05 ft/ft. **Table 4** lists the estimated full flow capacities for each location.

Table 4 – Connector Pipe Full Flow Capacities

Device ID	Outlet Pipe Diameter (in.)	Slope*	'N'-Value	Full Flow Capacity	Calculated Q ₁₀
2-001	18	0.05	0.012	25.4	3.12
2-002	18	0.05	0.012	25.4	2.63
2-003	18	0.05	0.012	25.4	6.52
2-004	18	0.05	0.012	25.4	2.94
2-005	18	0.05	0.012	25.4	4.61
2-006	18	0.05	0.012	25.4	3.47
2-007	18	0.05	0.012	25.4	3.33
2-008	36	0.05	0.012	161.5	10.13
2-009	18	0.05	0.012	25.4	0.26
2-010	18	0.05	0.012	25.4	2.41
2-011	18	0.05	0.012	25.4	2.75
2-012	18	0.05	0.012	25.4	8.91
2-013	18	0.05	0.012	25.4	5.87
2-014	24	0.05	0.012	54.8	5.05
2-015	24	0.05	0.012	54.8	2.46
2-016	24	0.05	0.012	54.8	1.23
2-017	24	0.05	0.012	54.8	1.55
2-018	18	0.05	0.012	25.4	2.26
2-019	18	0.05	0.012	25.4	3.61
2-020	18	0.05	0.012	25.4	4.81
2-021	18	0.05	0.012	25.4	2.40

Device ID	Outlet Pipe Diameter (in.)	Slope*	'N'-Value	Full Flow Capacity	Calculated Q10
2-022	18	0.05	0.012	25.4	3.00
2-023	24	0.05	0.012	54.8	3.68
2-024	24	0.05	0.012	54.8	3.07
3-001	24	0.05	0.012	54.8	36.73
3-002	28	0.05	0.012	75	27.31
3-003	24	0.05	0.012	54.8	5.25
3-004	20	0.05	0.012	38.3	64.97
3-005	16	0.05	0.012	18.753	14.35
3-006	18	0.05	0.012	25.4	11.16
3-007	24	0.05	0.012	54.8	47.84
3-008	24	0.05	0.012	54.8	99.58
3-009	15	0.05	0.012	15.6	22.91
3-010	36	0.05	0.012	161.5	2.03
3-011	14	0.05	0.012	13	8.37
3-012	12	0.05	0.012	8.6	32.34
3-013	18	0.05	0.012	25.4	9.44
3-014	18	0.05	0.012	25.4	6.18
3-015	18	0.05	0.012	25.4	8.10
3-016	18	0.05	0.012	25.4	4.12
3-017	18	0.05	0.012	25.4	5.46
3-018	18	0.05	0.012	25.4	8.92
3-019	18	0.05	0.012	25.4	2.72
3-020	18	0.05	0.012	25.4	0.17
3-021	12	0.05	0.012	8.6	0.31
3-022	18	0.05	0.012	25.4	1.34
3-023	18	0.05	0.012	25.4	0.48
3-024	27	0.05	0.012	75	13.07
3-025	18	0.05	0.012	25.4	0.65
3-026	18	0.05	0.012	25.4	3.73
3-027	18	0.05	0.012	25.4	2.29
3-028	18	0.05	0.012	25.4	2.77
3-029	15	0.05	0.012	15.6	4.49
3-030	24	0.05	0.012	54.8	26.64

The majority of the pipes carrying the flows from the subdrainage areas are able to adequately convey the calculated peak flows for the 10-year design storm.

Inspections and Maintenance Procedures

To aid in the inspection and maintenance of the CPS devices, the County is in the process of creating 2 custom O&M Plans for the agencies responsible for maintenance of the CPS devices: Ventura County Department of Airports (Devices 3-020 through 3-030) and Ventura County Public Works Agency's Transportation Department (remaining CPS devices). The County is also currently preparing an O&M plan for the 2 detention basin screens to be maintained by the Ventura County Watershed Protection District. These documents will include comprehensive information on all aspects of required inspection and maintenance of the CPS devices. These O&M Plans will also act as an official interagency maintenance agreement between VCWPD and the responsible maintenance groups. Included in the O&M Plans will be location maps with unique identification numbers, inspection procedures and frequency, equipment needed, maintenance procedures, emergency flood response, project contacts and documentation submittal details and required forms. Because the CPS devices are recently installed, the O&M Plans are subject to minor revisions over time. This chapter represents a summary of the inspection and maintenance procedures outlined in the documents.

The maps and CPS device information in the O&M Plans will be associated through unique CPS device numbers given to each installed full capture trash excluder. The first part of the identification number is a single number before the hyphen representing the Flood Control District Zone the device is located within. The second part is a three digit number representing a unique number for each device installed within that Flood Control District Zone numbered sequentially based on date of installation. For example, 3-001 represents the first device installed in Zone 3.

Each catch basin retrofitted with a CPS device has been identified in the field by a thermoplastic medallion (refer to [Figure 6](#)). Also, as a back-up, a 4-inch diameter red spray paint dot was marked in case medallion gets deteriorated with time to mark CPS devices before a replacement medallion is installed. Both medallion and the dot are positioned directly above the CPS device. This is for easy identification as device locations vary between catch basins.



Figure 6 - CPS Device Medallion and Spray Paint Dot Photos

All CPS devices will have inspection and maintenance completed a minimum of three times per fiscal year (July 1 through June 30). Each occurrence must be separated by at least 30 calendar days.

- One (1) before the wet season (before October 1),
- One (1) during the wet season (October 1 – April 15), and
- One (1) after the wet season (after April 15).

All inspections and maintenance performed will be recorded by the designated Transportation Department, VCWPD or Department of Airport O&M staff on the Checklist for Inspection and Maintenance form. The Inspection and maintenance procedure herein anticipates work will be completed by a two-person crew equipped with the proper tools and items per the O&M Plans.

Completed inspection and maintenance forms and pictures shall be submitted to the County Stormwater Program (CSWP) by July 30th each year for inclusion within the Stormwater Annual Report or upon request as needed for inclusion into the TMDL Compliance Reports. CSWP shall be notified within 1 week of any device removals or those identified as damaged.

CSWP will collect all inspection and maintenance forms and record all data within a spreadsheet for TMDL reporting requirements. Additionally, CSWP will coordinate required repairs identified on the inspection forms with the contractor that manufactured and installed the devices.

Conclusion and Summary










As shown in this report, the County of Ventura CPS retrofits within the RSBW subwatershed meet the definition of full capture system and are certified as a full capture system by trapping all particles retained by a 5-mm mesh screen, and having a treatment capacity exceeding the peak flow rate resulting from a 1-yr/1-hr storm in the subdrainage area. In addition, the following requirements are met:

1. Adequate Pipe Sizing: The pipes carrying the flows from the subdrainage area are able to convey peak flows: and
2. Regular Inspections and Maintenance: The full capture system will be regularly inspected and serviced to continually maintain adequate flow through capacity.

The County area within the RSBW subwatershed that drains to County MS4 system has been treated by the installations of the CPS devices. This report serves as a determination that the vertical Connector Pipe Screens (as described and identified in this Report), when installed and maintained in appropriately sized catch basins, completely satisfy the full capture definition of the RSBW TMDL for County Unincorporated areas. It is understood that the County will have an on-going obligation to demonstrate that the installation of these devices are appropriately sized and meet the intent of this program. Likewise, the County is responsible for on-going maintenance to ensure the systems perform to design specifications.

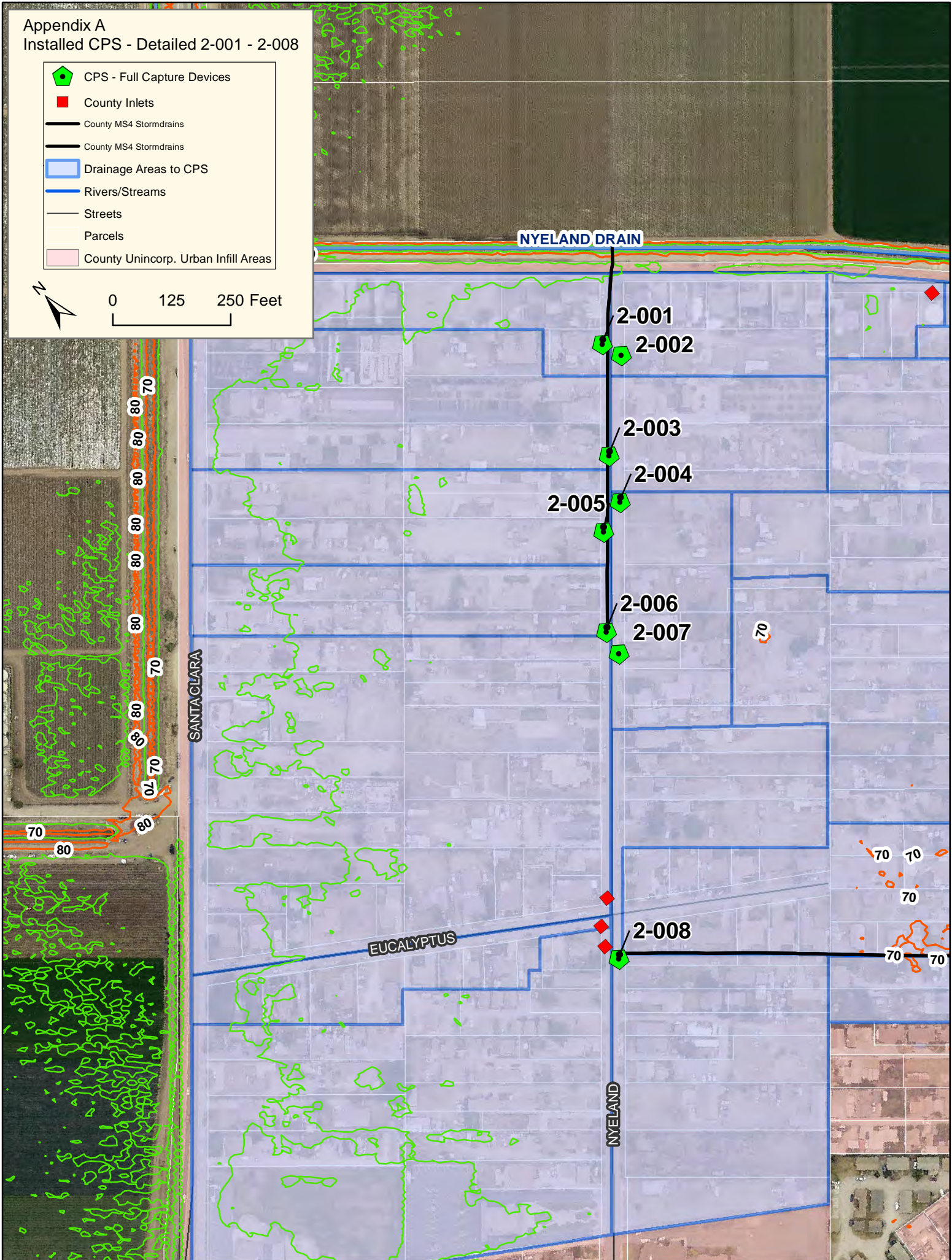
APPENDIX A
DETAILED MAPS AND DRAINAGE AREAS

Appendix A
Installed CPS - Detailed 2-001 - 2-008









-  CPS - Full Capture Devices
-  County Inlets
-  County MS4 Stormdrains
-  County MS4 Stormdrains
-  Drainage Areas to CPS
-  Rivers/Streams
-  Streets
-  Parcels
-  County Unincorp. Urban Infill Areas

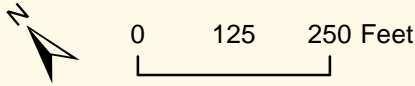


0 125 250 Feet



Appendix A
Installed CPS - Detailed 2-009 - 2-024

-  CPS - Full Capture Devices
-  County Inlets
-  County MS4 Stormdrains
-  Drainage Areas to CPS
-  Rivers/Streams
-  Streets
-  Parcels
-  County Unincorp. Urban Infill Areas



NYELAND DRAIN

FRIEDRICH

2-009

2-010

2-011

2-012

2-013

2-015 2-014

2-017

2-016

ORANGE

2-018

2-019

2-020

2-021

2-022

2-024

2-023

NYELAND DRAIN, TRIBUTARY

FARM










EUCALYPTUS

ALMOND

VENTURA

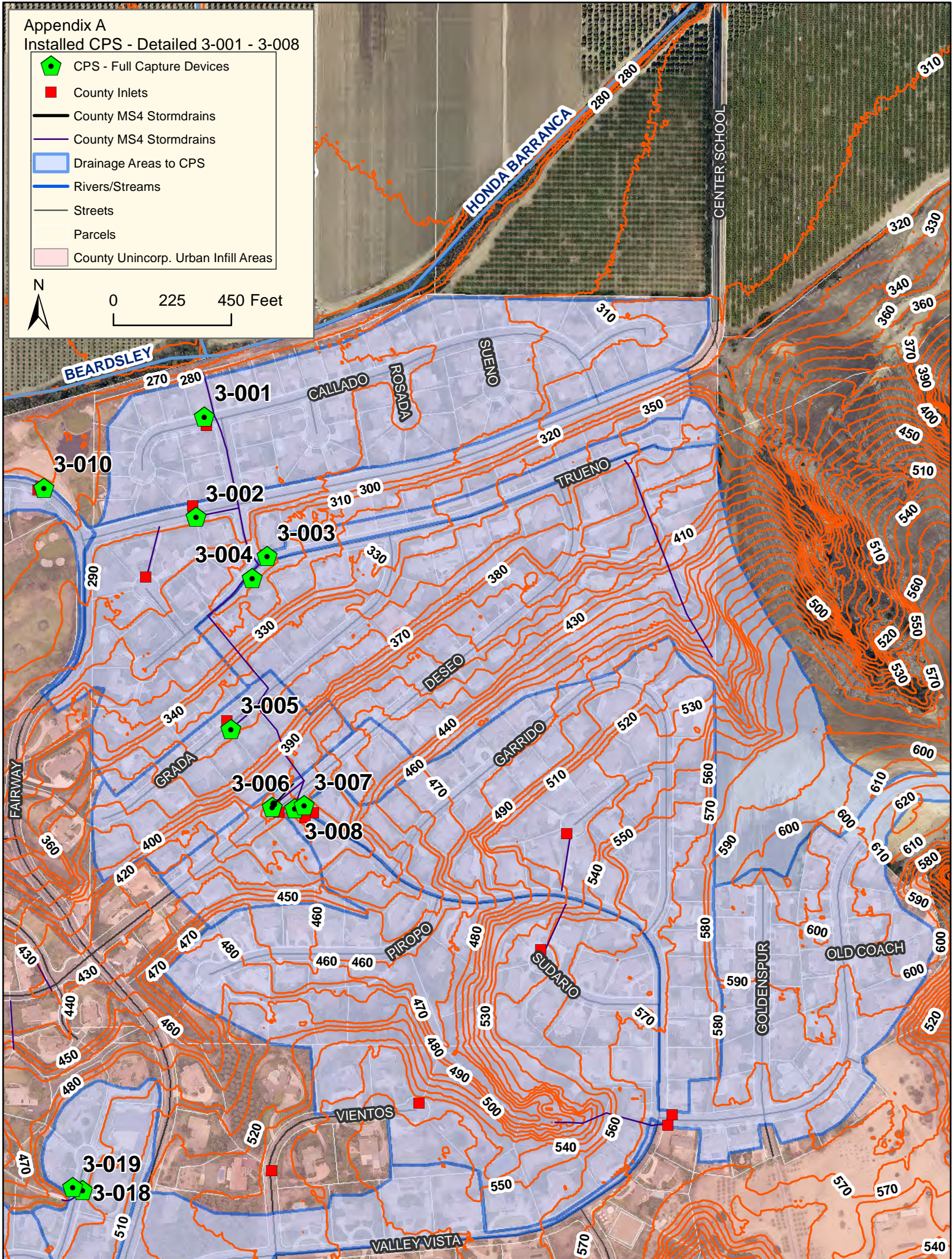
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Appendix A
Installed CPS - Detailed 3-001 - 3-008










-  CPS - Full Capture Devices
-  County Inlets
-  County MS4 Stormdrains
-  County MS4 Stormdrains
-  Drainage Areas to CPS
-  Rivers/Streams
-  Streets
-  Parcels
-  County Unincorp. Urban Infill Areas

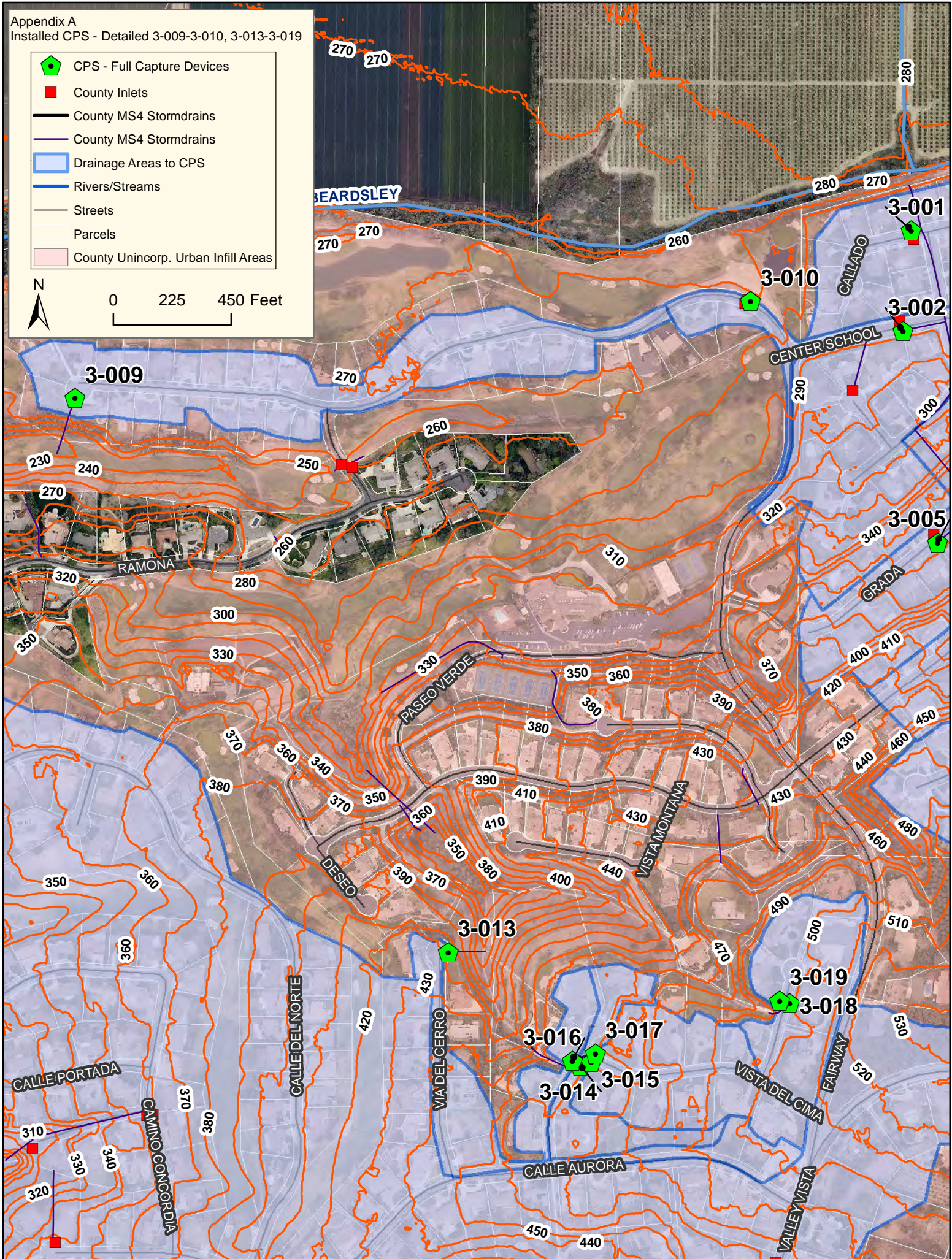
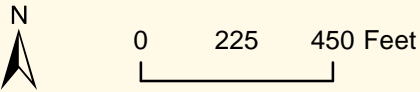


0 225 450 Feet

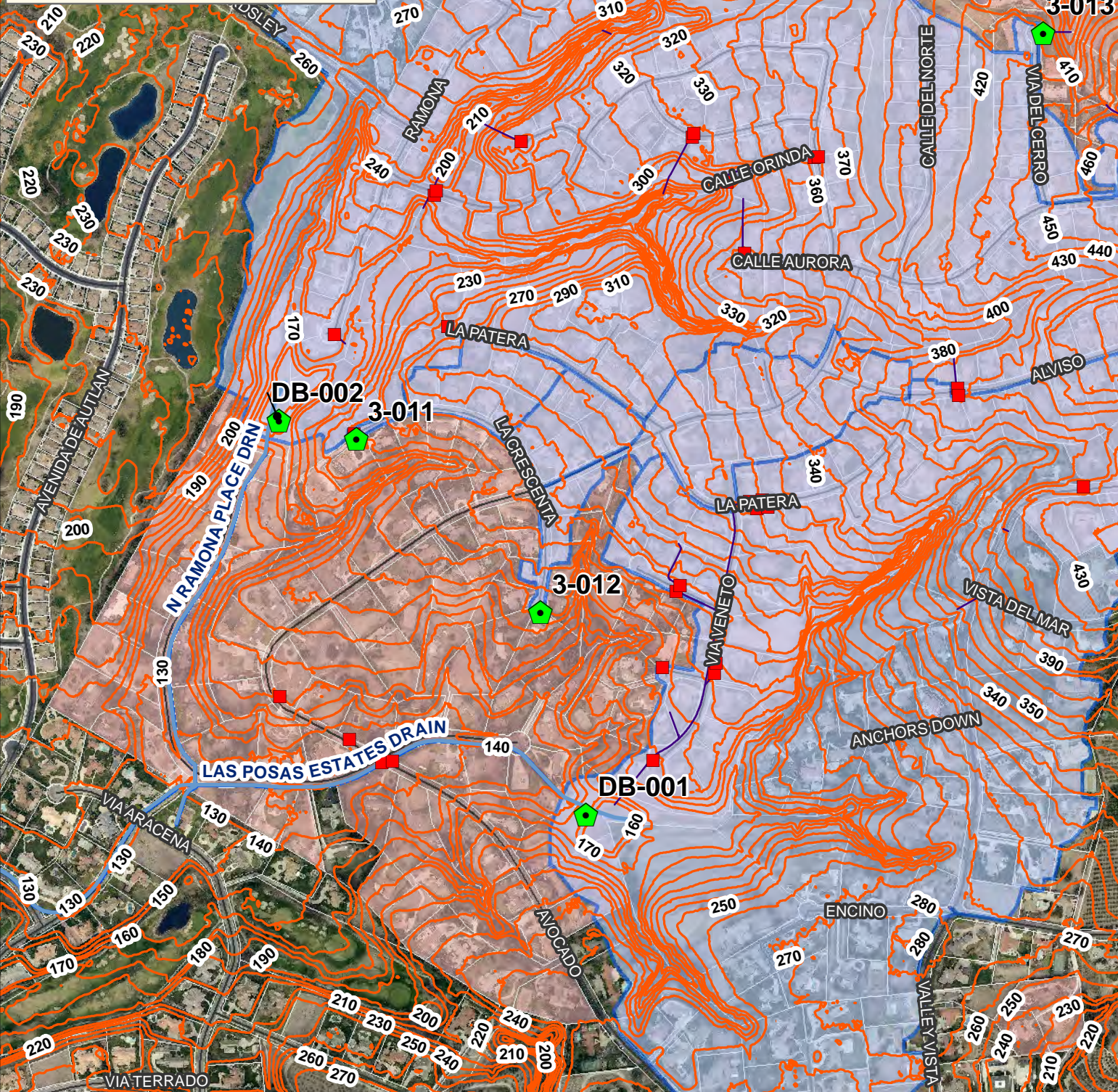
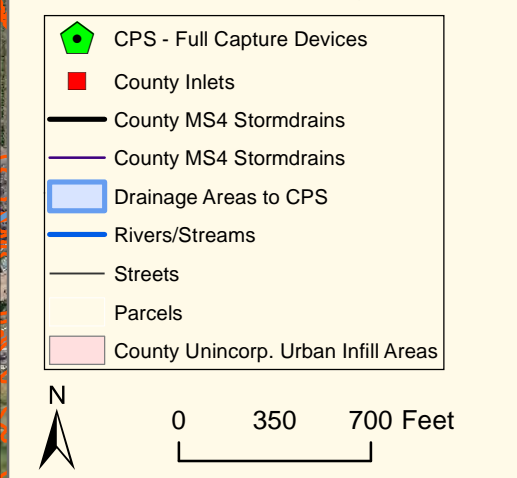


Appendix A
 Installed CPS - Detailed 3-009-3-010, 3-013-3-019











-  CPS - Full Capture Devices
-  County Inlets
-  County MS4 Stormdrains
-  County MS4 Stormdrains
-  Drainage Areas to CPS
-  Rivers/Streams
-  Streets
-  Parcels
-  County Unincorp. Urban Infill Areas



Appendix A
Installed CPS - Detailed 3-011-3-012, DB-001-DB002

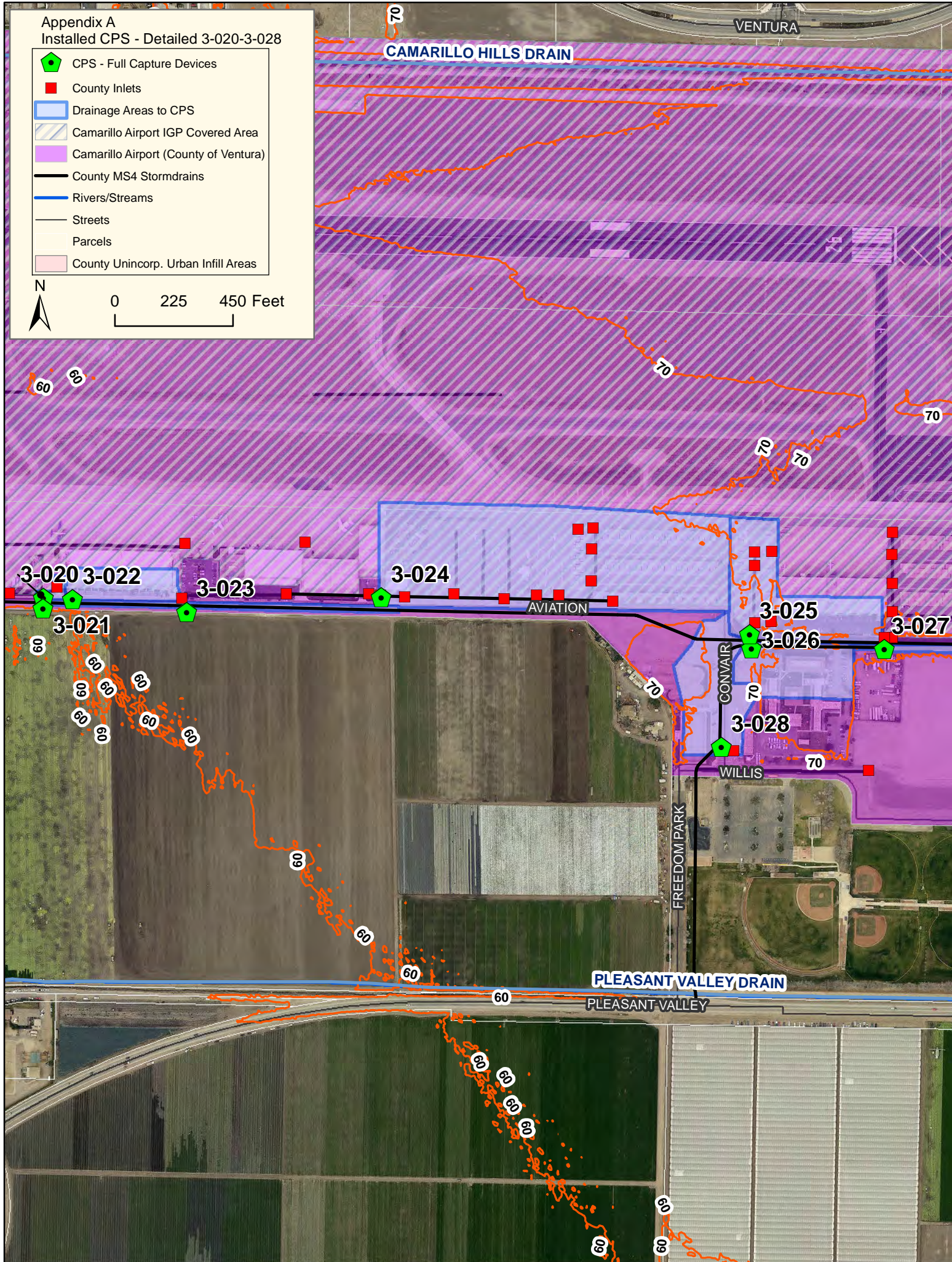


Appendix A
Installed CPS - Detailed 3-020-3-028











-  CPS - Full Capture Devices
-  County Inlets
-  Drainage Areas to CPS
-  Camarillo Airport IGP Covered Area
-  Camarillo Airport (County of Ventura)
-  County MS4 Stormdrains
-  Rivers/Streams
-  Streets
-  Parcels
-  County Unincorp. Urban Infill Areas



0 225 450 Feet

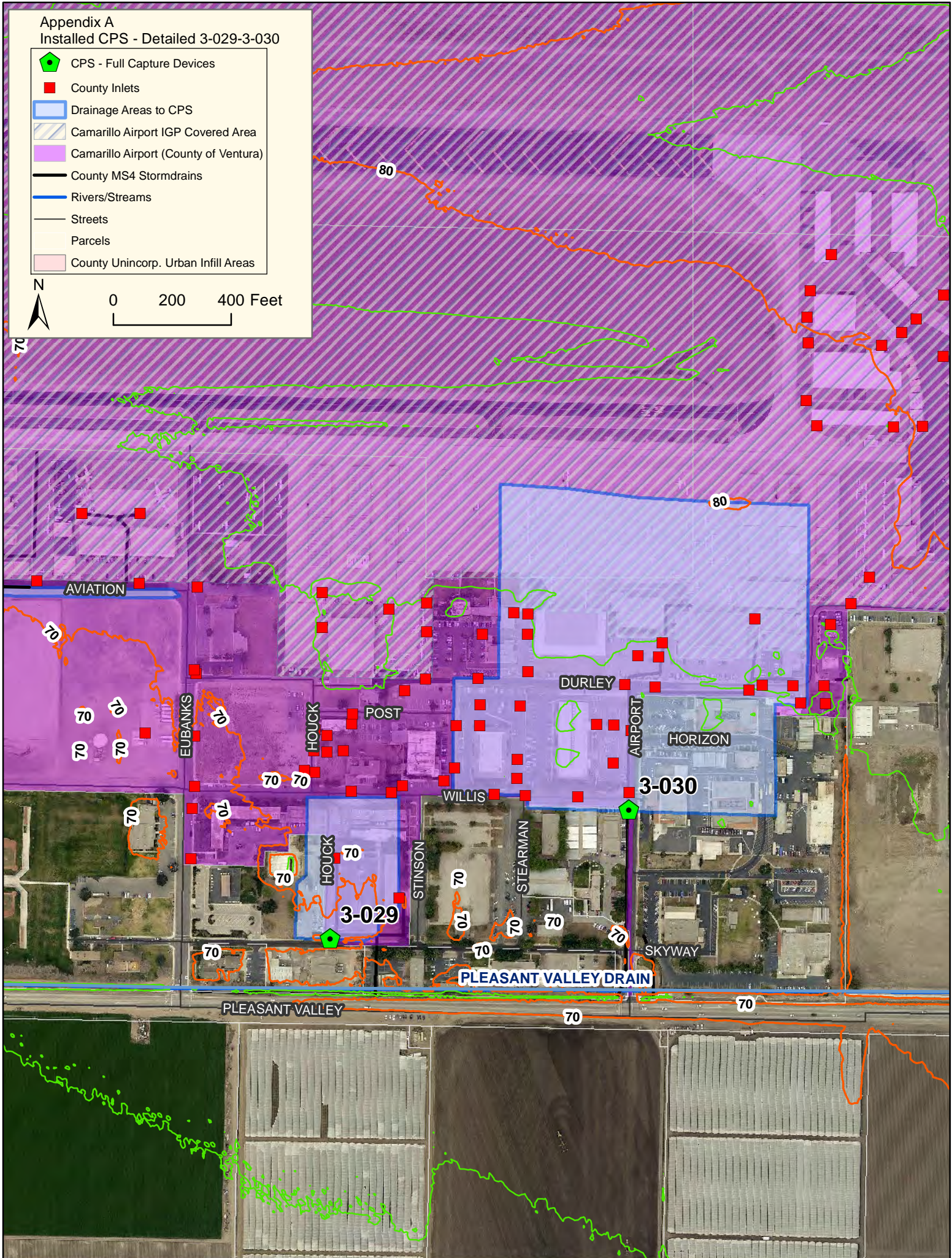


Appendix A
Installed CPS - Detailed 3-029-3-030

-  CPS - Full Capture Devices
-  County Inlets
-  Drainage Areas to CPS
-  Camarillo Airport IGP Covered Area
-  Camarillo Airport (County of Ventura)
-  County MS4 Stormdrains
-  Rivers/Streams
-  Streets
-  Parcels
-  County Unincorp. Urban Infill Areas



0 200 400 Feet



APPENDIX B
INSTALLATION PHOTOS

ZONE 2 - TRASH EXCLUDERS

2-001

Road = Nyeland Ave

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	5	Bypass (in)	12
Width (ft)	3.15	Length (in)	90
Length (ft)	10	Screen Height (in)	20
Outlet D (in)	18	Config = Square	



2-002

Road = Nyeland Ave

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.6	Bypass (in)	12
Width (ft)	3.4	Length (in)	43
Length (ft)	3	Screen Height (in)	20
Outlet D (in)	18	Config = "L" Shaped	



2-003

Road = Nyeland Ave

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4	Bypass (in)	12
Width (ft)	3.15	Length (in)	90
Length (ft)	10	Screen Height (in)	20
Outlet D (in)	18	Config = "L" Shaped	



2-004

Road = Nyeland Ave

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.7	Bypass (in)	12
Width (ft)	3.15	Length (in)	43
Length (ft)	3.5	Screen Height (in)	20
Outlet D (in)	18	Config = "L" Shaped	

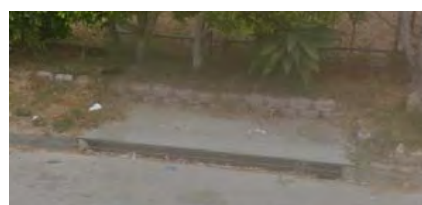


2-005

Road = Nyeland Ave

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4	Bypass (in)	12
Width (ft)	3.15	Length (in)	90
Length (ft)	10	Screen Height (in)	20
Outlet D (in)	18	Config = Square	



2-006

Road = Nyeland Ave

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4	Bypass (in)	12
Width (ft)	3.15	Length (in)	72
Length (ft)	10	Screen Height (in)	24
Outlet D (in)	18	Config = "L" Shaped	



ZONE 2 - TRASH EXCLUDERS

2-007

Road = Nyeland Ave

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.6	Bypass (in)	12
Width (ft)	3.15	Length (in)	36
Length (ft)	3.5	Screen Height (in)	24
Outlet D (in)	18	Config = "L" Shaped	



2-008

Road = Nyeland Ave

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4	Bypass (in)	N/A
Width (ft)	4.6	Length (in)	60
Length (ft)	6.5	Screen Height (in)	24
Outlet D (in)	36	Config = "L" Shaped	



2-009

Road = Orange Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.8	Bypass (in)	N/A
Width (ft)	4.3	Length (in)	37
Length (ft)	3	Screen Height (in)	18
Outlet D (in)	18	Config = Triangle	



2-010

Road = Orange Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.2	Bypass (in)	N/A
Width (ft)	4.4	Length (in)	37
Length (ft)	3	Screen Height (in)	18
Outlet D (in)	18	Config = Triangle	



2-011

Road = Orange Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.6	Bypass (in)	N/A
Width (ft)	4.5	Length (in)	37
Length (ft)	3	Screen Height (in)	18
Outlet D (in)	18	Config = "L" Shaped	



2-012

Road = Orange Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.3	Bypass (in)	N/A
Width (ft)	3.5	Length (in)	36
Length (ft)	3.4	Screen Height (in)	18
Outlet D (in)	18	Config = "L" Shaped	



ZONE 2 - TRASH EXCLUDERS

2-013

Road = Orange Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.8	Bypass (in)	N/A
Width (ft)	3.4	Length (in)	37
Length (ft)	3	Screen Height (in)	24
Outlet D (in)	18	Config = "L" Shaped	



2-014

Road = Orange Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.45	Bypass (in)	12
Width (ft)	4.5	Length (in)	48
Length (ft)	4.5	Screen Height (in)	16
Outlet D (in)	24	Config = Triangle	



2-015

Road = Orange Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.18	Bypass (in)	12
Width (ft)	4.5	Length (in)	36
Length (ft)	4.5	Screen Height (in)	18
Outlet D (in)	24	Config = Triangle	



2-016

Road = Orange Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.3	Bypass (in)	12
Width (ft)	4.5	Length (in)	36
Length (ft)	3	Screen Height (in)	18
Outlet D (in)	24	Config = Triangle	



2-017

Road = Orange Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.8	Bypass (in)	12
Width (ft)	4.5	Length (in)	48
Length (ft)	3	Screen Height (in)	18
Outlet D (in)	24	Config = Triangle	



2-018

Road = Almond Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.3	Bypass (in)	N/A
Width (ft)	4.5	Length (in)	37
Length (ft)	3	Screen Height (in)	18
Outlet D (in)	18	Config = "L" Shaped	



ZONE 2 - TRASH EXCLUDERS

2-019

Road = Almond Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.35	Bypass (in)	N/A
Width (ft)	4.5	Length (in)	39
Length (ft)	3	Screen Height (in)	20
Outlet D (in)	18	Config = "L" Shaped	



2-020

Road = Almond Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.8	Bypass (in)	N/A
Width (ft)	4.5	Length (in)	43
Length (ft)	3.6	Screen Height (in)	20
Outlet D (in)	18	Config = "L" Shaped	



2-021

Road = Almond Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.6	Bypass (in)	N/A
Width (ft)	4.5	Length (in)	37
Length (ft)	3.5	Screen Height (in)	18
Outlet D (in)	18	Config = "L" Shaped	



2-022

Road = Almond Dr

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.5	Bypass (in)	N/A
Width (ft)	4.6	Length (in)	37
Length (ft)	3	Screen Height (in)	18
Outlet D (in)	18	Config = "L" Shaped	



2-023

Road = Almond Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.2	Bypass (in)	N/A
Width (ft)	4.5	Length (in)	40
Length (ft)	3	Screen Height (in)	24
Outlet D (in)	24	Config = Triangle	



2-024

Road = Almond Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.44	Bypass (in)	12
Width (ft)	4.5	Length (in)	35
Length (ft)	3	Screen Height (in)	24
Outlet D (in)	24	Config = Triangle	



ZONE 3 - TRASH EXCLUDERS

3-001

Road = Callado St

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4	Diameter (ft)	2.33
Width (ft)	4	Circumference (ft)	3.75
Length (ft)	10	Height (ft)	3.17
Outlet Dia (ft)	2	Config	Semi-Circular



3-002

Road = Center School Rd

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.17	Diameter (ft)	2.5
Width (ft)	4	Circumference (ft)	3.75
Length (ft)	7	Height (ft)	2.92
Outlet Dia (ft)	2.33	Config	Semi-Circular



3-003

Road = Trueno Ave

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	5	Diameter (ft)	2.33
Width (ft)	4	Circumference (ft)	4.67
Length (ft)	14	Height (ft)	3.33
Outlet Dia (ft)	2	Config	Semi-Circular



3-004

Road = Trueno Ave

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.17	Diameter (ft)	3
Width (ft)	3.83	Circumference (ft)	4.75
Length (ft)	14	Height (ft)	2.5
Outlet Dia (ft)	1.67	Config	Semi-Circular



3-005

Road = Grada Ave

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4	Diameter (ft)	2.5
Width (ft)	3	Circumference (ft)	3.92
Length (ft)	7	Height (ft)	3.33
Outlet Dia (ft)	1.33	Config	Semi-Circular



3-006

Road = Deseo Ave

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3	Diameter (ft)	2.33
Width (ft)	3.83	Circumference (ft)	3.67
Length (ft)	10	Height (ft)	1.5
Outlet Dia (ft)	1.5	Config	Semi-Circular



ZONE 3 - TRASH EXCLUDERS

3-007

Road = Valley Vista Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.83	Diameter (ft)	2.33
Width (ft)	3.83	Circumference (ft)	3.67
Length (ft)	20	Height (ft)	2.5
Outlet Dia (ft)	2	Config	Semi-Circular



3-008

Road = Valley Vista Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.83	Diameter (ft)	2.83
Width (ft)	4.17	Circumference (ft)	4.42
Length (ft)	20	Height (ft)	2.83
Outlet Dia (ft)	2	Config	Semi-Circular



3-009

Road = Fairway Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	2.83	Bypass (in)	10
Width (ft)	1.75	Length (in)	42
Length (ft)	3.5	Screen Height (in)	16
Outlet D (in)	15	Config	Triangle



3-010

Road = Fairway Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	5	Bypass (in)	12
Width (ft)	2	Length (in)	42
Length (ft)	3.5	Screen Height (in)	24
Outlet D (in)	36	Config	Wall to Wall



3-011

Road = La Crescenta Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	2.83	Bypass (in)	10
Width (ft)	1.75	Length (in)	42
Length (ft)	3.33	Screen Height (in)	16
Outlet D (in)	14	Config	Triangle



3-012

Road = La Crescenta Dr

Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	2.7	Bypass (in)	10
Width (ft)	1.83	Length (in)	42
Length (ft)	3.5	Screen Height (in)	14
Outlet D (in)	12	Config	Triangle



ZONE 3 - TRASH EXCLUDERS

3-013

Road = Villa Del Cerro
Access Type = Drop Inlet Grate

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.92	Bypass (in)	10
Width (ft)	1.75	Length (in)	42
Length (ft)	3.5	Screen Height (in)	16
Outlet D (in)	18	Config = Triangle	



3-014

Road = Vista Del Campo
Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.5	Bypass (in)	12
Width (ft)	3	Length (in)	48
Length (ft)	7	Screen Height (in)	20
Outlet D (in)	18	Config = "L" Shaped	



3-015

Road = Vista Del Cima
Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3	Bypass (in)	10
Width (ft)	3	Length (in)	48
Length (ft)	7	Screen Height (in)	16
Outlet D (in)	18	Config = Square	



3-016

Road = Vista Del Campo
Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	5.17	Bypass (in)	12
Width (ft)	3	Length (in)	48
Length (ft)	7	Screen Height (in)	24
Outlet D (in)	18	Config = "L" Shaped	



3-017

Road = Vista Del Cima
Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	6	Bypass (in)	12
Width (ft)	3	Length (in)	48
Length (ft)	7	Screen Height (in)	24
Outlet D (in)	18	Config = "L" Shaped	



3-018

Road = Via Con Dios
Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	3.92	Bypass (in)	12
Width (ft)	3	Length (in)	72
Length (ft)	10	Screen Height (in)	18
Outlet D (in)	18	Config = "L" Shaped	



ZONE 3 - TRASH EXCLUDERS

3-019

Road = Via Con Dios

Access Type = Manhole Lid (Circular)

Catch Basin Dimensions		CPS Device Dimensions	
Depth (ft)	4.3	Bypass (in)	12
Width (ft)	3	Length (in)	42
Length (ft)	3.5	Screen Height (in)	24
Outlet D (in)	18	Config = Wall to Wall	



DB001 – Las Posas Estates Detention Basin



DB002 – Ramona Detention Basin



APPENDIX C
AS-BUILT DRAWINGS

[illegible]

SHEET NO.	TITLE
1.	TITLE SHEET
2.	HYELAND ACRES - DEVICES (HA1 THRU HA8)
3.	HYELAND ACRES - DEVICES (HA9 THRU HA17)
4.	HYELAND ACRES - DEVICES (HA18 THRU NA26)
5.	CAMARILLO HEIGHTS - DEVICES (CH1 THRU CH5)
6.	CAMARILLO HEIGHTS - DEVICES (CH6 THRU CH12)
7.	CAMARILLO AIRPORT - DEVICES (CA1 THRU CA11)
8.	DEVICE DETAILS
9.	DEVICE DATA TABLES
10.	CAMARILLO HEIGHTS - DEBRIS BASIN DEVICES (CH13 AND 14)

DATE PROJECT COMPLETED 8/26/2016
REVISIONS SUBMITTED BY D. YANT
DRAWING REVISED BY D. KIRBY
APPROVED BY D. KIRBY DATE 10/18/16

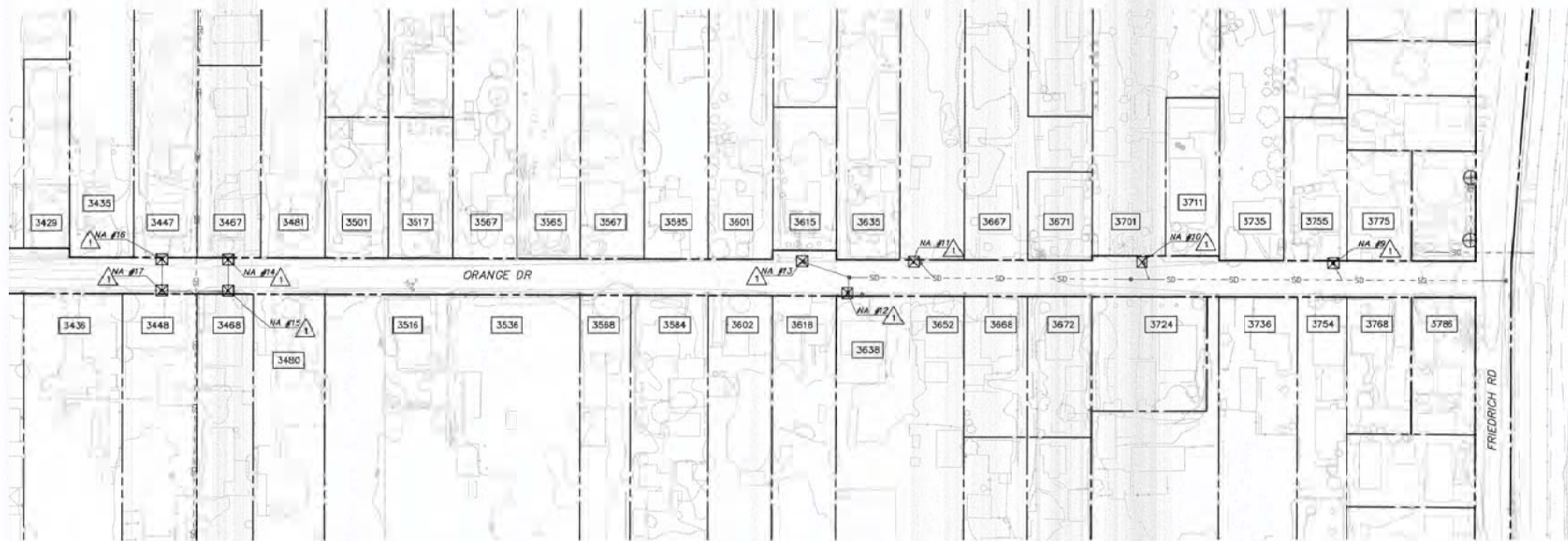
1. LETTERS AND NUMBERS IN \ominus INDICATE THE RETAIL CALL-OUT AND SHEET ON WHICH REFERRED DETAIL IS SHOWN.
2. NUMBERS IN \triangle REFER TO NOTES ON THE SAME SHEET UNLESS OTHERWISE NOTED.
3. EXISTING IMPROVEMENTS WITHIN THE RIGHT OF WAY AND WORK AREAS SHALL REMAIN AND SHALL BE PROTECTED UNLESS OTHERWISE NOTED. DAMAGED IMPROVEMENTS SHALL BE REPLACED IN KIND TO A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION.
4. UTILITIES ARE SHOWN AS KNOWN TO EXIST AT TIME OF SURVEY. UTILITIES MAY HAVE BEEN OMITTED, MISPLACED, AND/OR RELOCATED. CONTRACTOR SHALL EXERCISE CARE IN EXCAVATION AND SHALL PROTECT ALL UTILITIES.
5. CONTRACTOR SHALL NOTIFY UTILITY OWNERS A MINIMUM OF 48 HOURS PRIOR TO STARTING WORK IN AREAS AFFECTING THEIR FACILITIES.
6. CONTRACTOR SHALL REMOVE AND DISPOSE OF TRASH, SEDIMENT AND DEBRIS INSIDE CATCH BASINS AND MANHOLES IDENTIFIED FOR DEVICE INSTALLATION IN ACCORDANCE WITH SPECIFICATIONS.
7. CONTRACTOR SHALL FIELD VERIFY CATCH BASIN DIMENSIONS AND CONFIRM FEASIBILITY OF INSTALLING DEVICES PRIOR TO DEVICE MANUFACTURE/ORDER.
8. NUMBERS IN \circ INDICATE BID ITEMS FOR WHICH PAYMENT WILL BE MADE.

CA	CAMARILLO AIRPORT
CH	CAMARILLO HEIGHTS
NA	MYELAND ACRES

1-800-422-4133
CALL USA/SC
FOR UNDERGROUND LOCATION
2 WORKING DAYS BEFORE YOU DIG

[illegible]

Detailed description of the map: This is a topographic map of a section of Hollywood, California. It shows a network of roads, including Dolby Drive running horizontally across the middle, and several vertical or diagonal streets like Genee St, Laurel St, and Hollywood Blvd. The terrain is indicated by contour lines. Five specific areas are identified as project sites, each enclosed in a rectangle with diagonal hatching. These are labeled 'PROJECT SHEET 5' through 'PROJECT SHEET 9'. 'PROJECT SHEET 5' is located near the intersection of Dolby Drive and Laurel St. 'PROJECT SHEET 6' is further east along Dolby Drive. 'PROJECT SHEET 7' is south of Dolby Drive, near Laurel St. 'PROJECT SHEET 8' is west of Dolby Drive, near Genee St. 'PROJECT SHEET 9' is north of Dolby Drive, near Laurel St. A legend in the bottom right corner shows a hatched box next to the text 'PROPOSED DEVELOPMENT'.



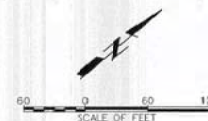
PLAN VIEW - NYELAND ACRES

CONSTRUCTION NOTES

1. CONSTRUCT FULL CAPTURE PIPE SCREEN FOR THE OUTLET PIPE WITHIN THE EXISTING CATCH BASIN PER SHEET B. DIMENSION INFORMATION PER SHEET 9 - CONTRACTOR TO VERIFY IN FIELD. (4)

LEGEND

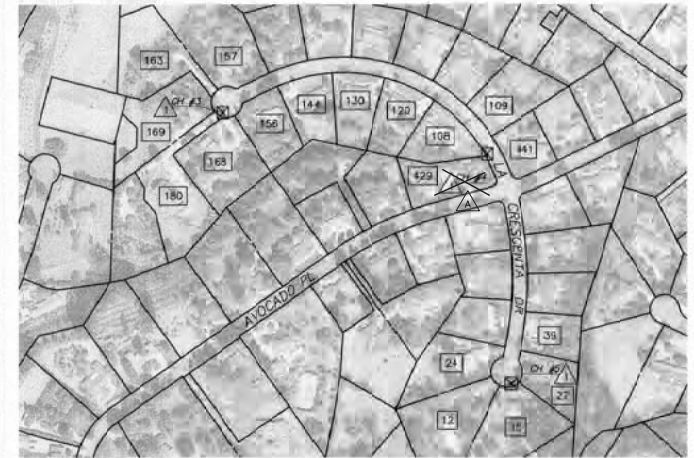
- ☒ EXISTING INLET/MANHOLE DESIGNATED FOR DEVICE INSTALLATION
- ⊕ EXISTING INLET/MANHOLE - NO DEVICE REQUIRED
- ⊕ EXISTING DRAIN STRUCTURE - NO DEVICE REQUIRED
- CA #24 AREA DEVICE #
- (SD)--- EXISTING STORM DRAIN
- 3717 PARCEL ADDRESS NUMBER



RECORD DRAWING
 DATE PROJECT COMPLETED 8/26/2016
 REVISIONS SUBMITTED BY D. YANT
 DRAWING REVISED BY D. KIRBY
 APPROVED BY D. KIRBY DATE 10/18/16

4/15/2016 2:45 PM

DATE: 4/15/16 TMA:GJ	PROJECT: 1204-1120001 (Sheet) 1204-1120001_Plan.dwg	GREGORY J. MUSSER PROJECT ENGINEER DATE: 4/18/2016 SHEET: 77827 OF: 204120001	G.M. DESIGNED D.L. CHECKED G.M. CHECKED	DATE: 4/18/2016 DATE: 4/19/16 DATE: 4/20/16	COUNTY OF VENTURA PUBLIC WORKS AGENCY WATERSHED PROTECTION DISTRICT	SPEC. NO. WP16-11(1) PROJ. NO. 40530	REVOLON SLOUGH AND BEARDSLEY WASH FULL CAPTURE TRASH DEVICES NYELAND ACRES - DEVICES (NA9 THRU NA17)	SHEET 3 OF 10 DRAWING NO. Y-2-3854
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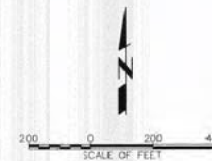
PLAN VIEW - CAMARILLO HEIGHTS

CONSTRUCTION NOTES

1. CONSTRUCT FULL CAPTURE PIPE SCREEN FOR THE OUTLET PIPE WITHIN THE EXISTING CATCH BASIN PER SHEET B. DIMENSION INFORMATION PER SHEET S - CONTRACTOR TO VERIFY IN FIELD. (A)

LEGEND

- ☒ EXISTING INLET/MANHOLE: DESIGNATED FOR DEVICE INSTALLATION
- ⊕ EXISTING INLET/MANHOLE - NO DEVICE REQUIRED
- ⊕ EXISTING DRAIN STRUCTURE - NO DEVICE REQUIRED
- CA #24 AREA DEVICE #
- EXISTING STORM DRAIN
- 3717 PARCEL ADDRESS NUMBER



RECORD DRAWING

DATE PROJECT COMPLETED 8/26/2016
 REVISIONS SUBMITTED BY D. YANT
 DRAWING REVISED BY D. KIRBY
 APPROVED BY D. KIRBY DATE 10/18/16

4/15/2016 2:45 PM

DATE: 4/15/16	TIME: 2:45 PM
PROJECT: 1016-110	PROJECT: 1016-110
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PROJECT: 1016-110	PROJECT: 1016-110
PROJECT: 1016-110	PROJECT: 1016-110



GREGORY J. MUSSER
 PROJECT ENGINEER
 DATE: 4/18/2016
 SIGNED: 77827
 2044133900
 4/15/2016
 4/15/2016

G.M. DESIGNED
 D.L. DRAWN
 G.M. CHECKED

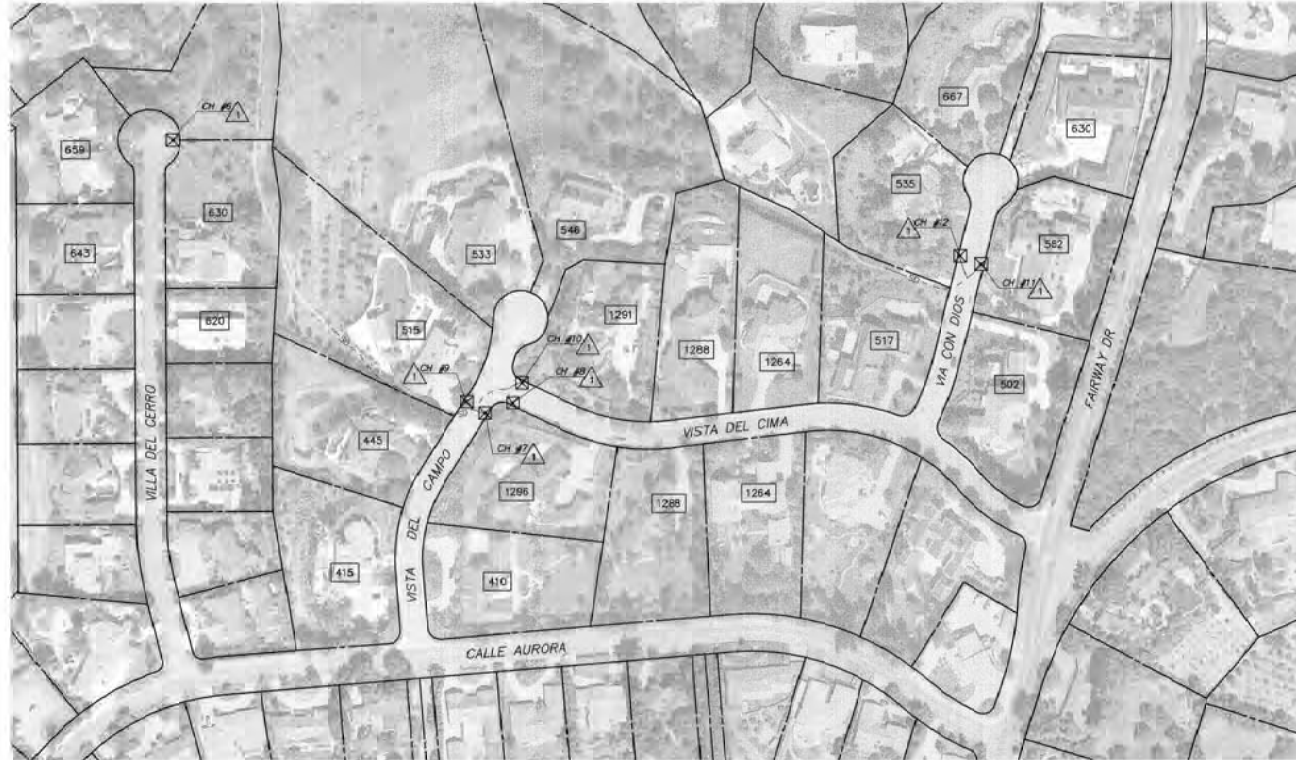
4/18/2016
 4/18/16
 4/20/2016

COUNTY OF VENTURA
 PUBLIC WORKS AGENCY
 WATERSHED PROTECTION DISTRICT

SHEET NO.
 WP16-110
 PROJECT NO.
 40530

REVOLON SLOUGH AND BEARDSLEY WASH
 FULL CAPTURE TRASH DEVICES
 CAMARILLO HEIGHTS - DEVICES (CH1 THRU CH5)

SHEET 5
 OF 10
 DRAWING NO.
 Y-2-3856



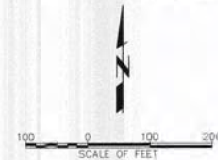
CONSTRUCTION NOTES

1. CONSTRUCT FULL CAPTURE PIPE SCREEN FOR THE OUTLET PIPE WITHIN THE EXISTING CATCH BASIN PER SHEET B. DIMENSION INFORMATION PER SHEET S - CONTRACTOR TO VERIFY IN FIELD. (4)

LEGEND

- EXISTING INLET/MANHOLE DESIGNATED FOR DEVICE INSTALLATION
- EXISTING INLET/MANHOLE - NO DEVICE REQUIRED
- EXISTING DRAIN STRUCTURE - NO DEVICE REQUIRED
- AREA DEVICE #
- EXISTING STORM DRAIN
- PARCEL ADDRESS NUMBER

PLAN VIEW - CAMARILLO HEIGHTS



RECORD DRAWING
 DATE PROJECT COMPLETED 8/26/2016
 REVISIONS SUBMITTED BY D. YANT
 DRAWING REVISED BY D. KIRBY
 APPROVED BY D. KIRBY DATE 10/18/16

4/15/2016 2:45 PM

SAVE DATE: 4/15/16 PM140

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REVISION	DESCRIPTION	APP	DATE



GREGORY J. MUSSER
 PROJECT ENGINEER
 DATE: 4/18/2016
 P.E. #77827
 2016-12-05-000
 4-15-2016
 DRAW DATE

G.M. DESIGNED
 D.L. DESIGN
 G.M. CHECKED

4/19/2016
 4/19/16
 4/20/2016

COUNTY OF VENTURA
 PUBLIC WORKS AGENCY
 WATERSHED PROTECTION DISTRICT

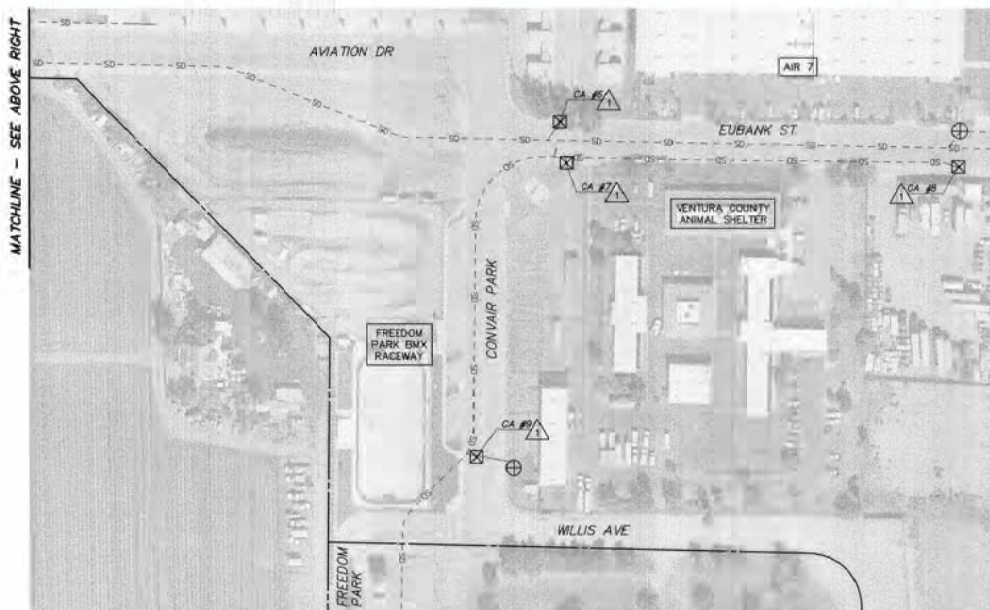
SPEC. NO.
 WP16-11(1)
 PROJ. NO.
 40530

REVOLON SLOUGH AND BEARDSLEY WASH
 FULL CAPTURE TRASH DEVICES
 CAMARILLO HEIGHTS - DEVICES (CH6 THRU CH12)

SHEET 6
 OF 10
 DRAWING NO.
 Y-2-3857



MATCHLINE - SEE BELOW LEFT



MATCHLINE - SEE ABOVE RIGHT



CONSTRUCTION NOTES

1. CONSTRUCT FULL CAPTURE PIPE SCREEN FOR THE OUTLET PIPE WITHIN THE EXISTING CATCH BASIN PER SHEET B. DIMENSION INFORMATION PER SHEET S - CONTRACTOR TO VERIFY IN FIELD. (4)



PLAN VIEW - CAMARILLO AIRPORT



LEGEND

- ☒ EXISTING INLET/MANHOLE DESIGNATED FOR DEVICE INSTALLATION
- ⊕ EXISTING INLET/MANHOLE - NO DEVICE REQUIRED
- ⊕ EXISTING DRAIN STRUCTURE - NO DEVICE REQUIRED
- CA #1 — AREA DEVICE #
- SD--- EXISTING STORM DRAIN
- 3717 PARCEL ADDRESS NUMBER

RECORD DRAWING
DATE PROJECT COMPLETED 8/26/2016
REVISIONS SUBMITTED BY D. YANT
DRAWING REVISED BY D. KIRBY
APPROVED BY D. KIRBY DATE 10/18/16

4/15/2016 2:45 PM

REVISION	DESCRIPTION	APP	DATE
D			
C			
B			
A			



GREGORY J. MUSSER
PROJECT ENGINEER
DATE: 4/18/2016
R.L.C. 77827
0064153000
4/15/2016
PLAN DATE

C.M. DESIGNED
C.M. CHECKED
C.M. DESIGNED
C.M. CHECKED

4/15/2016
4/15/2016
4/15/2016

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

SPEC. NO.
WP16-11(1)
PROJ. NO.
49530



REVOLON SLOUGH AND BEARDSLEY WASH
FULL CAPTURE TRASH DEVICES
CAMARILLO AIRPORT - DEVICES (CA1 THRU CA11)





SHEET 7
OF 10
SHOWN NO.
Y-2-3858

WYLAND ACRES (NA)											
DEVICE NO.	MODEL NO.	PROTECTIVE BYPASS LID?	DIMENSIONS PER SHEET 8				OUTLET PIPE DIA. (in)	DIRECTION OF DISCHARGE PIPE	ACCESS TYPE	Q ₁₀ (cfs)	Q ₁₅ (cfs)
			H _b (IN)	L (IN)	H _s (IN)	CONFIGURATION					
1	22W12015H	YES	12	90	20	SQUARE	18	NE	MANHOLE	3.12	0.70
2	22W12015H	YES	12	43	20	"L" SHAPE	18	SW	MANHOLE	2.63	0.59
3	22W12015H	YES	12	90	20	"L" SHAPE	18	NE	MANHOLE	6.52	1.47
4	22W12015H	YES	12	43	20	"L" SHAPE	18	SW	MANHOLE	2.94	0.66
5	22W12015H	YES	12	90	20	SQUARE	18	NE	MANHOLE	4.61	1.04
6	30SL-15/36SR-15	YES	12	72	24	"L" SHAPE	18	NE	MANHOLE	3.47	0.78
7	30SL-15/36SR-15	YES	12	36	24	"L" SHAPE	18	SW	MANHOLE	3.33	0.75
8	4BSL-15/48SR-15	NO	0	60	24	"L" SHAPE	18	SE	GRATE	10.33	2.24
9	30SL-15/36SR-15	NO	0	37	18	TRIANGLE	18	NE	MANHOLE	0.26	0.06
10	30SL-15/36SR-15	NO	0	37	18	TRIANGLE	18	NE	MANHOLE	2.41	0.54
11	22W12015H	NO	0	37	18	"L" SHAPE	18	NE	MANHOLE	2.75	0.62
12	22W12015H	NO	0	36	18	"L" SHAPE	18	SW	MANHOLE	8.91	2.03
13	30SL-15/36SR-15	NO	0	37	24	"L" SHAPE	18	NE	MANHOLE	5.87	1.33
14	32W18015H	YES	12	48	18	TRIANGLE	24	SE	GRATE	5.06	1.12
15	32W18015H	YES	12	36	18	TRIANGLE	24	SW	GRATE	2.46	0.54
16	26W18015H	YES	12	36	18	TRIANGLE	24	SE	GRATE	1.23	0.27
17	32W18015H	YES	12	48	18	TRIANGLE	24	NE	GRATE	1.55	0.34
18	30SL-15/36SR-15	NO	0	37	18	SQUARE	18	NE	MANHOLE	2.76	0.50
19	22W12015H	NO	0	39	20	SQUARE	18	NE	MANHOLE	3.61	0.81
20	22W12015H	NO	0	43	20	SQUARE	18	SW	MANHOLE	4.81	1.08
21	30SL-15/36SR-15	NO	0	37	18	SQUARE	18	SW	MANHOLE	2.40	0.54
22	30SL-15/36SR-15	NO	0	37	18	SQUARE	18	NE	MANHOLE	3.08	0.68
23	30SL-15/36SR-15	NO	0	40	24	TRIANGLE	24	SE	GRATE	3.66	0.81
24	30SL-15/36SR-15	YES	12	35	24	TRIANGLE	24	SE	GRATE	3.07	0.68
25	30SL-15/36SR-15	NO	0	48	20	SQUARE	24	N	GRATE	2.53	0.56
26	30SL-15/36SR-15	YES	12	36	18	TRIANGLE	24	W	GRATE	1.20	0.27

CONSTRUCTION NOTES

- MODEL NOS. LISTED ARE FROM LATEST AGE FLEXFORM CATALOG MODEL MANUFACTURER AND CONFIGURATION - MAY BE CHANGED WITH APPROVED EQUAL.
- MANY DEVICES WILL REQUIRE CUSTOM BOTTOM EXTENSIONS TO FIT NON-UNIFORM CATCH BASIN FLOORS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY, MEASURE, AND CONSTRUCT SUCH EXTENSIONS IN THE FIELD.
- DEVICE IN THIS INLET/STRUCTURE MAY REQUIRE CUSTOMIZATION.
- MANHOLE OR GRATE LID IS BOLTED OR FROZEN.

CAMARILLO HEIGHTS (CH)											
DEVICE NO.	MODEL NO.	PROTECTIVE BYPASS LID?	DIMENSIONS PER SHEET 8				OUTLET PIPE DIA. (in)	DIRECTION OF DISCHARGE PIPE	ACCESS TYPE	Q ₁₀ (cfs)	Q ₁₅ (cfs)
			H _b (in)	L (in)	H _s (in)	CONFIGURATION					
1	22W12015H	YES	10	42	16	TRIANGLE	15	S	GRATE	22.90	1.92
2	42W18015H	YES	12	42	24	WALL TO WALL	18	NE	GRATE	2.03	0.14
3	22W12015H	YES	10	42	16	TRIANGLE	18	SW	GRATE	1.57	1.06
4	22W12015H	YES	DETERMINED INFEASIBLE IN FIELD				18	SW	GRATE	7.51	0.95
5	22W12015H	YES	10	42	14	TRIANGLE	11	S	GRATE	32.15	3.11
6	22W12015H	YES	10	42	16	TRIANGLE	18	E	GRATE	1.45	0.75
7	30SL-15/36SR-15	YES	12	48	20	"L" SHAPE	18	SW	MANHOLE	6.36	0.49
8	22W12015H	YES	10	48	16	SQUARE	18	SW	MANHOLE	8.31	0.64
9	22W12015H	YES	12	48	24	"L" SHAPE	18	SE	MANHOLE	0.11	0.33
10	22W12015H	YES	12	48	24	"L" SHAPE	18	SW	MANHOLE	5.46	0.43
11	30SL-15/36SR-15	YES	12	72	18	WALL TO WALL	18	SW	MANHOLE	8.52	0.71
12	30SL-15/36SR-15	YES	12	42	24	WALL TO WALL	18	SE	MANHOLE	2.17	0.32
13			SEE SHEET 10 FOR CUSTOM DEBRIS BASIN DEVICES								
14											

CAMARILLO AIRPORT (CA)											
DEVICE NO.	MODEL NO. 	PROTECTIVE BYPASS LID?	DIMENSIONS PER SHEET 8				OUTLET PIPE DIA. (in)	DIRECTION OF DISCHARGE PIPE 	ACCESS TYPE	Q ₁₀ (cfs)	Q ₁₅ (cfs)
			H _b (IN)	L (IN)	H _s (IN)	CONFIGURATION					
1	30SL-15/36SR-15	 YES	10	37	20	TRIANGLE	18	W	MANHOLE	0.17	0.04
2	22W12015H	YES	12	42	20	WALL TO WALL	12	N	MANHOLE	0.31	0.08
3	22W12015H	YES	10	35	16	WALL TO WALL	18	W	GRATE	6.54	0.35
4	22W12015H	YES	12	43	24	WALL TO WALL	18	N	MANHOLE	0.48	0.12
5	42W18015H	YES	12	36	24	TRIANGLE	27	S	GRATE	13.17	3.38
6	22W12015H	YES	8	36	10	TRIANGLE	18	W	MANHOLE	0.45	0.12
7	30SL-15/36SR-15	YES	10	36	18	TRIANGLE	18	S	MANHOLE	3.73	0.71
8	30SL-15/36SR-15	YES	12	36	24	TRIANGLE	18	N	MANHOLE	2.29	0.43
9	30SL-15/36SR-15	NO	0	36	24	TRIANGLE	18	W	MANHOLE	2.17	0.53
10	22W12015H	YES	10	32	16	TRIANGLE	15	E	GRATE	4.12	1.06
11	22W18015H	 YES	11	30	22	WALL TO WALL	18	S	MANHOLE	11.90	3.05



Stantec
1001 10th Street, Suite 200, Ventura, CA 93001
Phone: (805) 646-2200 Fax: (805) 646-2201

GREGORY J. MUSSER
PE/CE/Engineer
DATE: 4/18/2016
ALC: 77627
CSC: 120602
C.E. 15-2016
C.M. DATE

C.M. DATE

4/18/2016
4/18/2016
4/18/2016
4/18/2016

COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT

PROJECT NO.
WP16-11(1)
DRAWING NO.
40530

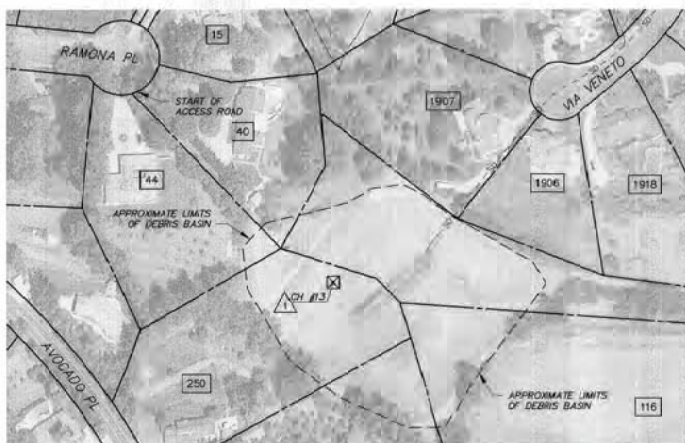
REVOLON SLOUGH AND BEARDSLEY WASH
FULL CAPTURE TRASH DEVICES
DEVICE DATA TABLES

RECORD DRAWING
DATE PROJECT COMPLETED 8/26/2016
REVISIONS SUBMITTED BY D. YANT
DRAWING REVISOR BY D. KIRBY
APPROVED BY D. KIRBY DATE 10/18/16

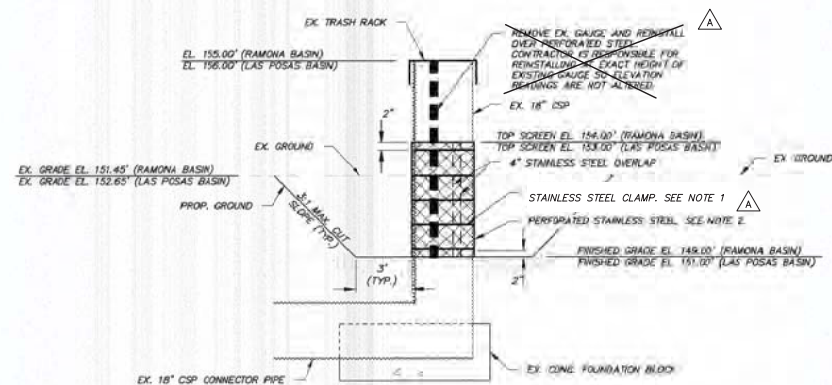
SHEET 9
OF 10
DRAWING NO.
Y-2-3860



PLAN VIEW - RAMONA DETENTION BASIN



PLAN VIEW - LAS POSAS ESTATES DETENTION BASIN



NOTE:

1. INDIANA SEAL (SERIES 300) STAINLESS STEEL HOSE CLAMPS USED FOR SECURING PERFORATED STAINLESS STEEL SCREEN. CLAMPS SPACED AT 12" MAX O.C.
2. PERFORATED STAINLESS STEEL SHALL BE TYPE 304, 18 GAUGE, MILL FINISH, 3/16" HOLES ON 1/4" CENTERS, AND STAGGERED PATTERN. STAINLESS STEEL SCREEN SHALL BE A SINGLE SHEET WRAPPED AROUND THE STANDPIPE, SECURED AND OVERLAPPED AS NOTED IN THE DETAIL, UNLESS OTHERWISE APPROVED. CONTRACTOR RESPONSIBLE FOR MEASUREMENT OF EXISTING STANDPIPE OUTSIDE CIRCUMFERENCE PRIOR TO SCREEN MANUFACTURE.
3. EXCAVATED MATERIALS MAY BE SPREAD EVENLY AMONG DEBRIS BASIN. TRASH IN EXCAVATED MATERIALS SHALL BE REMOVED AND DISPOSED OF APPROPRIATELY.

TYPICAL DETAIL - DEBRIS BASIN STANDPIPE DEVICE

SCALE: N.T.S.

CONSTRUCTION NOTES

1. CONSTRUCT FULL CAPTURE DEBRIS BASIN STANDPIPE DEVICE PER DETAIL METHOD. (S)

RECORD DRAWING

DATE PROJECT COMPLETED: 8/26/2016
 REVISIONS SUBMITTED BY: D. YANT
 DRAWING REVISED BY: D. KIRBY
 APPROVED BY: D. KIRBY, DATE 10/18/16

4/15/2016 2:49 PM

REVISION	DESCRIPTION	DATE
1	GAUGE NOT REMOVED, HOSE CLAMPS SUB	10/18/16



GREGORY J. MUSSER
 PROJECT ENGINEER
 DATE: 4/18/2016
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**COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT**

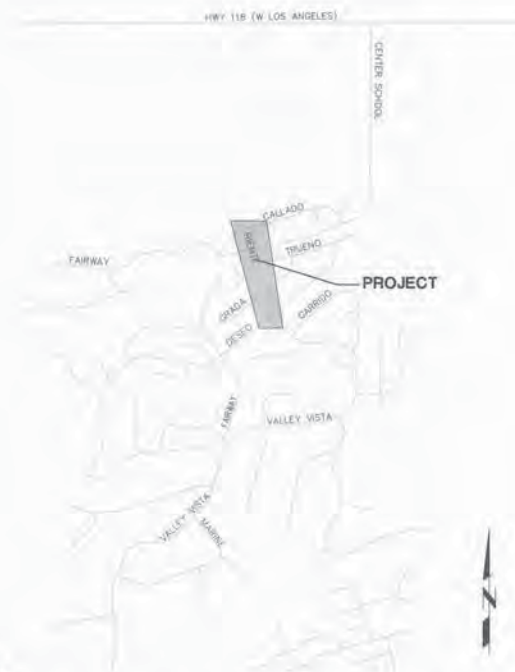
**INSTALLATION OF FULL CAPTURE CATCH
BASIN TRASH EXCLUDER DEVICES,
VENTURA RIVER AND CAMARILLO HILLS**

INDEX TO SHEETS	
SHEET NO.	TITLE
1.	TITLE SHEET
2.	TRASH EXCLUDER LOCATIONS



GENERAL LOCATION PLAN, VENTURA RIVER AREA

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SCALE OF FEET



GENERAL LOCATION PLAN, CAMARILLO HILLS AREA

0 1000 2000 3000
SCALE OF FEET

GENERAL NOTES

1. ALL EXISTING IMPROVEMENTS INCLUDING BUT NOT LIMITED TO CATCH BASINS AND EXISTING UTILITIES WITHIN THE RIGHT OF WAY AND WORK AREAS SHALL REMAIN AND SHALL BE PROTECTED UNLESS OTHERWISE NOTED. DAMAGED IMPROVEMENTS SHALL BE REPLACED IN KIND TO A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION AND TO THE SATISFACTION OF THE ENGINEER. ALL DAMAGED IMPROVEMENTS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
2. EXISTING IMPROVEMENTS ARE SHOWN AS KNOWN TO EXIST AT TIME OF SURVEY; SOME MAY HAVE BEEN OMITTED, MISPLACED, AND/OR RELOCATED.
3. NUMBERS IN ○ INDICATE BID ITEMS UNDER WHICH PAYMENT WILL BE MADE.
4. NUMBERS IN △ REFER TO NOTES ON THE SAME SHEET UNLESS OTHERWISE NOTED.
5. CONTRACTOR SHALL CONTACT THE PROJECT MANAGER A MINIMUM OF 48 HOURS PRIOR TO STARTING TRASH EXCLUDER UNIT INSTALLATIONS.

UNDERGROUND SERVICE ALERT
1-800-422-4133
CALL USA/SC
FOR UNDERGROUND LOCATION
2 WORKING DAYS BEFORE YOU DIG



[Signature]
7/16/14
7/16/14
7/21/14

**COUNTY OF VENTURA
PUBLIC WORKS AGENCY
WATERSHED PROTECTION DISTRICT**

PROJECT NO.
WP15-D2(N)
SHEET NO.
40530

**INSTALLATION OF FULL CAPTURE CATCH
BASIN TRASH EXCLUDER DEVICES,
VENTURA RIVER AND CAMARILLO HILLS**
TITLE SHEET

SHEET 1
OF 2
DRAWING NO.
114453

1. CONSTRUCT FULL CAPTURE CONNECTOR PIPE SCREEN FOR THE OUTLET PIPE WITHIN THE EXISTING CATCH BASIN. DIMENSIONS TO BE DETERMINED BY CONTRACTOR IN FIELD. (1) (2)
2. TWO FULL CAPTURE CONNECTOR PIPE SCREENS CONSTRUCTED SIDE BY SIDE IS REQUIRED AT THIS LOCATION TO SPAN LENGTH OF RECTANGULAR CATCH BASIN OUTLET.
3. REMOVE AND DISPOSE OF EXISTING FIXED OR AUTOMATIC RETRACTABLE SCREEN TRASH EXCLUDER AT CATCH BASIN INLET.



VENTURA RIVER AREA - PLAN VIEW



CAMARILLO HILLS AREA - PLAN VIEW



D				DM		7/16/14	COUNTY OF VENTURA PUBLIC WORKS AGENCY WATERSHED PROTECTION DISTRICT	SHEET NO. WP15-02(N)	INSTALLATION OF FULL CAPTURE CATCH BASIN TRASH EXCLUDER DEVICES, VENTURA RIVER AND CAMARILLO HILLS TRASH EXCLUDER LOCATIONS	SHEET 2
C				DM		7/16/14		PROJECT NO. 40530		DRAWING NO. 11445A
B				DM						
A				DM		7/16/2014				

Appendix 5. No Dumping Sign Installation Photos

REVOLON SLOUGH AND BEARSDLY WASH SUBWATERSHED

Installation of 5 educational and 6 “No dumping allowed” signs on June 22, 2016



HIGHWAY 101 AND WEST VENTURA BLVD

APPROXIMATELY 4 MILES UPSTREAM OF TMRP SITE 1



STURGIS ROAD

APPROXIMATELY 2.5 MILES UPSTREAM OF TMRP SITE 1



PLEASANT VALLEY ROAD

APPROXIMATELY 1.75 MILES UPSTREAM OF TMRP SITE 1



LAGUNA ROAD

APPROXIMATELY 0.5 MILE UPSTREAM OF TMRP SITE 1



WOOD ROAD AT TMRP SITE 1



ETTING ROAD AT TMRP SITE 5





October 25, 2016

Ms. Jenny Newman
TMDL Section Chief
Los Angeles Regional Water Quality Control Board
320 W. 4th St., Suite 200
Los Angeles, California 90013

SUBJECT: MALIBU CREEK TRASH TMDL ANNUAL REPORT (UPPER MEDEA CREEK AND UPPER LINDERO CREEK) BASELINE AND ANNUAL REPORT DATED OCTOBER 20 2016

Dear Ms. Newman:

Enclosed for your review is the Fourth Malibu Creek Trash TMDL Annual Monitoring Report for 2014-2015. This Annual Monitoring Report is being submitted by the County of Ventura (the County), Ventura County Watershed Protection District (the District), and City of Thousand Oaks (the City) per the requirements of the Malibu Creek Trash TMDL, Los Angeles Regional Water Quality Control Board Resolution No. R4 2008-007. It documents fourth year implementation of the Malibu Creek Watershed Trash Monitoring and Reporting Plan and Minimum Frequency of Assessment and Collection (TMRP/MFAC) program, submitted by the County, the District, and the City on April 30, 2010.

This annual summary report presents the data and analysis of trash loading patterns from the defined assessment areas during normal and critical weather events, an evaluation of the effectiveness of existing Best Management Practices (BMPs), and comparison against the project defined baseline trash Waste Load Allocations.

If you have any comments or question regarding the attached document, please contact Ewelina Mutkowska at (805) 645-1382 or Paul Jorgensen at (805) 449-2470.

Sincerely,

Peter Sheydayi
Ventura County Watershed Protection District
Interim Director

Jay T. Spurgin
City of Thousand Oaks
Public Works Director

CC: Renee Purdy, Regional Water Quality Control Board (RWQCB), Regional Programs Chief
Stefanie Hada, RWQCB, Environmental Scientist
Jeff Pratt, Ventura County Public Works Agency (VCPWA), Director
Arne Anselm, Ventura County Watershed Protection District, Deputy Director
Ewelina Mutkowska, VCPWA, Stormwater Program Manager
John Minkel, City of Thousand Oaks, Utilities Superintendent
Paul Jorgensen, City of Thousand Oaks, Environmental Programs Coordinator
Ron Manwill, City of Thousand Oaks, Environmental Programs Analyst



**City of Thousand Oaks
County of Ventura and
Ventura County Watershed Protection District**

Annual Trash Monitoring and Reporting Plan Report for the Malibu Creek Watershed



October 20, 2016

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Introduction

This Annual Report is for the fourth year of Trash Total Maximum Daily Load (TMDL) implementation, July 2014-June 2015. It is submitted by and for the City of Thousand Oaks (the City), the County of Ventura (the County), and the Ventura County Watershed Protection District (the District). This report fulfills requirements specified by the Los Angeles Region Water Quality Control Plan with regard to the Malibu Creek Watershed Trash TMDL, Resolution No. R4-2008-007 (effective July 7, 2009). The trash monitoring results and compliance assessments are reported for point source waste load allocations (WLAs) and non-point source load allocations (LAs). The monitoring efforts that generated these data were conducted according to the Trash Monitoring and Reporting Plan (TMRP) for the Malibu Creek Trash TMDL submitted to Los Angeles Regional Water Quality Control Board (RWQCB) on April 30, 2010.

Additionally, the monitoring data were evaluated to discern trends and factors that may help explain trash loading such as:

- Variation in monthly and yearly trash accumulation data,
- Effects of extreme weather on trash and litter transport,
- Possible loading sources, and
- Effectiveness of the Minimum Frequency of Assessment and Collection and Best Management Practice (MFAC/BMP) programs.

Based on a review of these factors, recommendations for modifications to improve BMP effectiveness or revisions to the MFAC schedule may be made.

Overview

To monitor and take steps to prevent watershed impairment caused by transport of trash in Lindero and Medea Creeks, a proposed TMRP was devised with representative locations so that trash accumulation within creek areas could be estimated. Compliance with point source WLAs is also determined. Non-point source trash is evaluated by visual checks and controlled by scheduled crew and ad hoc volunteer cleanups.

The assessment locations were selected at the lowest point of flow from each subwatershed where creek morphology is conducive to accumulate trash deposits. This provides a measure of the level of trash that could move between subwatersheds. These locations were also judged to be accessible and safe for entry.

The contribution of trash and litter transported by critical events (high winds and sufficiently intense rainstorms) has been estimated. This allows the trash loading impacts of these events to be considered as part of a trash and litter loading evaluation.

As specified in the TMRP, a minimum of one collection per month was to be done at each site. All collections were completed on the dates indicated in Table 1.

Table 1. Collection Date Summary

Monitoring Date	Lindero Creek Reach 2, LC-1	Medea Creek Reach 2, MC-1
7/10/14	X	X
8/7/14	X	X
9/10/14	X	X
10/27/14	X	X
11/21/14	X	X
12/29/14	X	X
1/22/15	X	X
2/17/15	X	X
3/17/15	X	X
4/15/15	X	X
5/12/15	X	X
6/10/15	X	X

Assessment Area Characteristics

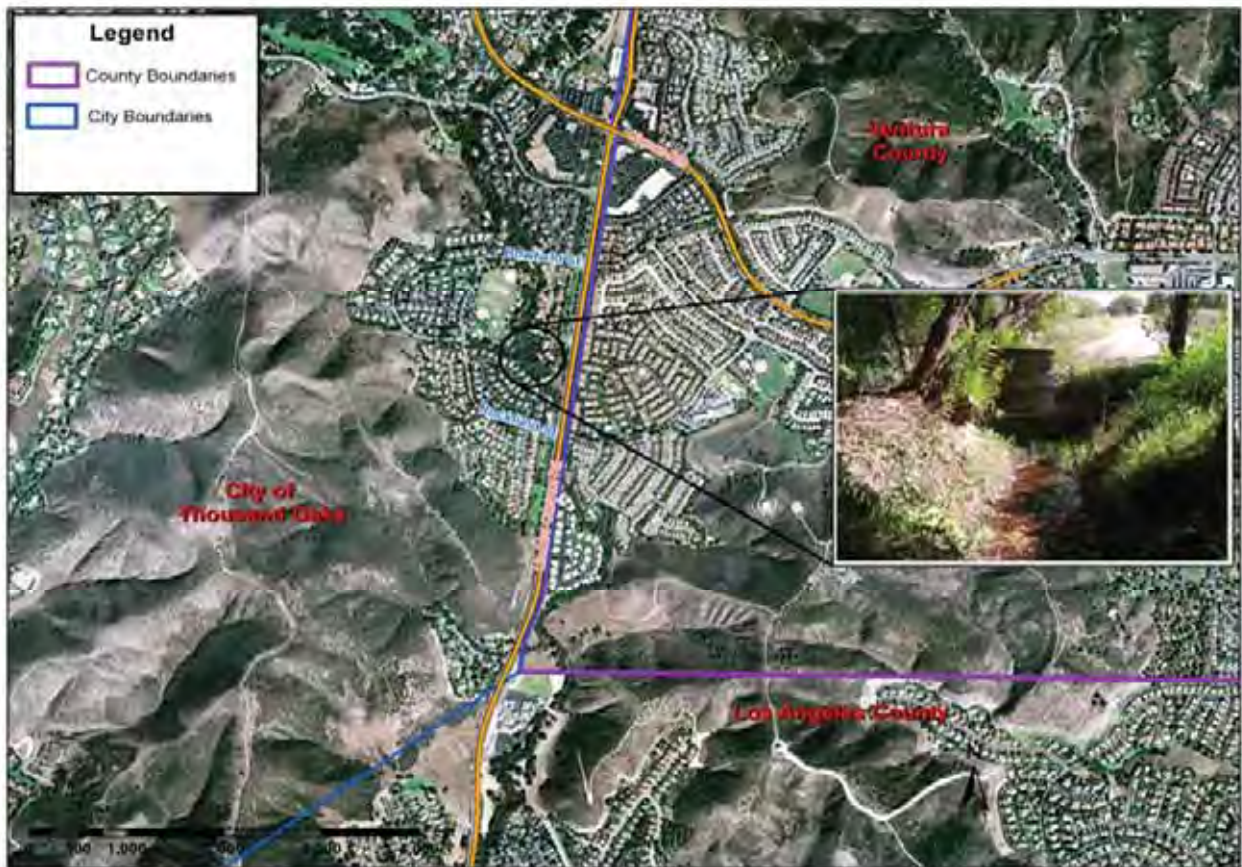
A detailed review of land uses in a drainage area offers another view of potential trash sources and activities responsible for inappropriate disposal of trash. For example, visual inspections have shown that popular recreation areas and areas close to schools have a high potential for litter generation. This is partly due to a high incidence of snack and packaged convenience food being consumed in these areas.

Lindero Creek Subwatershed

The area within the City of Thousand Oaks jurisdiction with drainage to Reach 2 of Lindero Creek is 2.08 square miles. A breakdown of land uses in this area is: 49.03% open space, 44.71% residential; 6.25% public and institutional lands (includes a golf course and parks); and 1.29% commercial. The population is estimated to be 1,970 persons. Areas in unincorporated Ventura County also have drainage to Lindero Creek. This area is 0.9 square miles. The land uses of this area are 9.5% commercial; 49.7% residential; and 40.8% open space. Population data for the unincorporated area is not yet available.

The Lindero Creek assessment site is a debris basin with a creek that is typified as a braided flow that converges at a perforated stand pipe for below flood-stage discharges that bypass the overflow structure. A reduction in hydraulic gradient at the debris basin, in addition to the standpipe's size restriction, promotes trash and debris accumulation in the flood plain after storm-level flows recede. The location of the Lindero Creek assessment area is shown in Figure 1.

Figure 1. Lindero Creek Assessment Site (LC-1) Map



Medea Creek Subwatershed

The area within County unincorporated community of Oak Park with drainage to Reach 2 of Medea Creek is 3.32 square miles. A breakdown of land uses for this area is: 6.93% commercial and community facilities; 30.08% residential; and 62.98% open space. The population in Oak Park is about 13,800.

Medea Creek follows a single flow path as it moves through the assessment area. When flow levels rise due to a storm event, the stream configuration causes bank overflow and deposition of transported trash and debris onto an existing flood plain. The Medea Creek assessment site is shown in Figure 2.

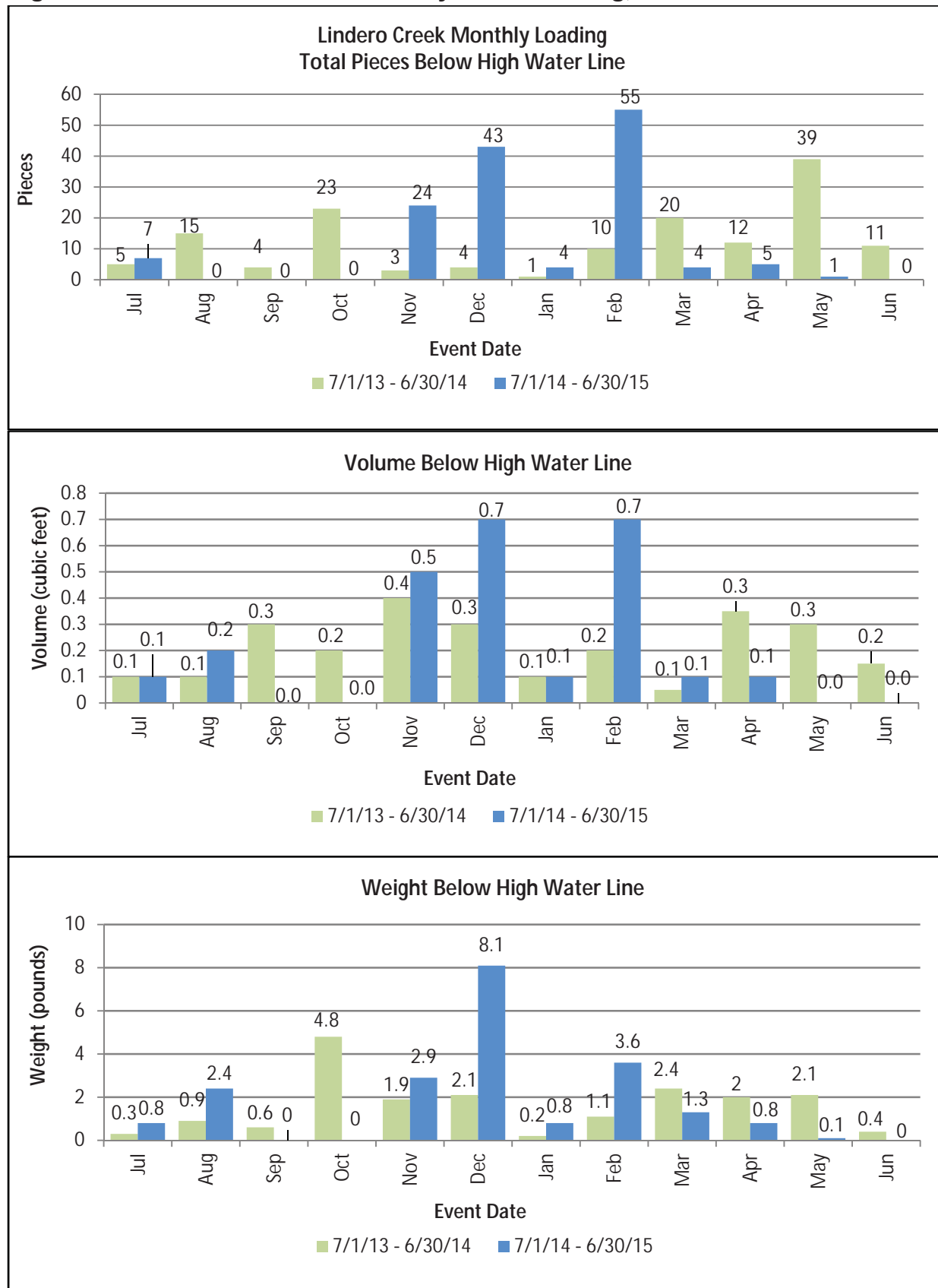
Figure 2. Medea Creek Assessment Site (MC-1) Map



Evaluation of Trash Loading

Comparison of monthly piece counts helps identify temporal patterns such as increases due to seasonal usage, weather events, or isolated incidents each of which could be a cause for a spike in trash levels. Additionally, each of the metrics can reveal something different about the sources and activities causing loading, as well as the modes of trash transport. Figure 3 shows the monthly trash levels for the current and prior year at Lindero Creek.

Figure 3. Current & Prior Year Monthly Trash Loading, LC1



Lindero Creek

As seen in the Figure 3, peak months for trash pieces were November, December, and February. These months also had peak levels for both weight and volume metrics. This multi-metric loading emphasizes that the quantity of trash loading in those months was elevated. Reviewing the data sheets for what materials were responsible for the high loading amounts provided more information about the cause. Larger numbers of bigger, heavier litter items came from sporting goods (e.g., tennis balls), glass bottles, metal cans, and plastic bottles. Random littering, extreme weather event transport or a combination of both are likely causative factors for the abnormally high loading.

Volunteer cleanup of trash has removed much of the non-point source trash in the vicinity of assessment area LC1. Consequently, the movement of accumulated stores of trash is not a likely source of the loading spikes. A more likely cause was the transport of newly deposited materials from random littering, moved by one or more extreme weather events.

Timing of the spikes may give an indication as to the dominant mode for trash accumulation. Weather transport is certainly a contender as all the spikes were in the winter months this year. On the other hand, summer months may be predisposed to higher litter loading because of increased outdoor activities triggered by increased summer temperatures. A second factor for an increased summer accumulation may be from litter by school-aged children that have less structure and supervision when schools are closed for summer break (mid-June to late August).

To further examine the timing of trash spikes, the frequency during which summer or winter period had a higher count of collected pieces was compared using 3 years of data. Table 2 shows the total piece counts for winter - October to March, during which extreme weather events most often occur, and summer - May to September.

Table 2. Comparison of Seasonal Counts at LC1

Collection Period	Piece Count Summer months	Pieces Count Winter Months
2012-2013	285	150
2013-2014	57	61
2014-2015	69	130

These data do not support the assertion that winter weather increased the amounts of litter due to enhanced transport. That said, the dataset is too small to derive a certain conclusion. Variation in loading between years should be expected for several reasons: weather events have differing levels of intensity; the timing of the litter deposition may result in its removal before transport i.e., BMPs such as volunteer cleanups and street

sweeping could remove deposition before weather transport occurs; and, the differing amounts of random littering. The likelihood that weather transport caused spike-level loading in this current year will be explored in the section on extreme weather events.

Because random littering is a suspected cause, a longer range evaluation may add support this belief. Table 3 shows the last three years of collection data for monthly pieces.

Table 3. Monthly Loading Comparison - Multiple Years, Lindero Creek

Month	Pieces Collected at Lindero Creek		
	2012-2013	2013-2014	2014-2015
July	24	5	7
August	14	15	0
September	8	4	0
October	9	23	0
November	29	3	24
December	11	4	43
January	53	1	4
February	17	10	55
March	31	20	4
April	21	12	5
May	0	39	1
June	12	11	0

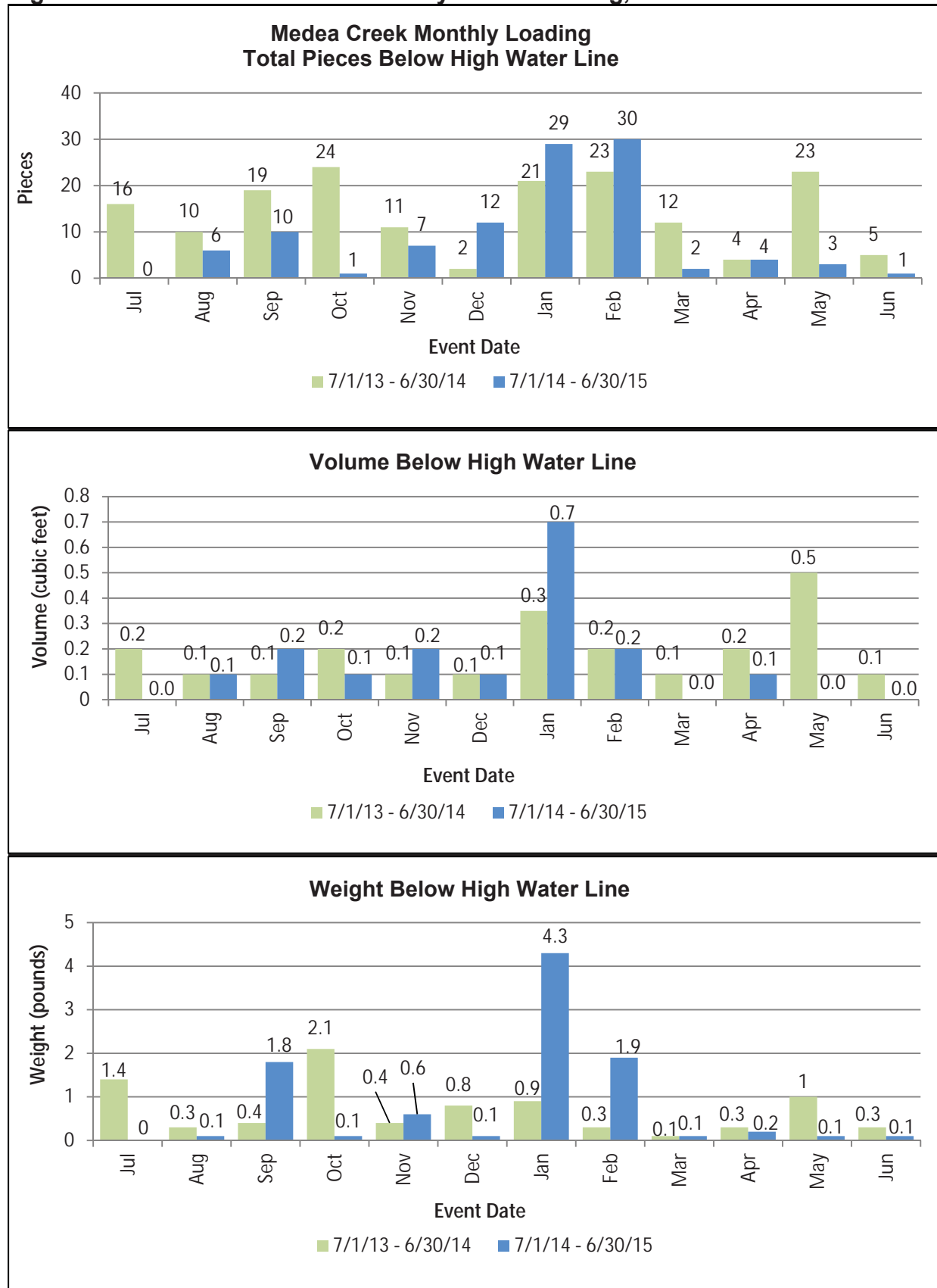
From an informal review of these data, no month shows consistent high loading for the three years (≥ 20 pieces). The only pattern that can be seen in 2014-15 is that higher loading occurs in winter months. Given this timing, there is greater probability that weather events were intense enough to have played a larger role as a transport mechanism. The timing of the deposition of litter was a second, complementary factor.

Medea Creek

Figure 4 shows loading patterns for the various metrics at Medea Creek.

At MC1, January and February of 2014-15 had spike-level litter in all metrics. These loading extremes being in winter is similar to the data pattern at LC1. This timing suggests that weather events may have been a larger factor than previous years for transporting litter rather than random littering that can occur at the site.

January and February had the largest spikes for piece counts, with a smaller spike in December. For the volume data, January had a large spike with a minor ones occurring in September, November and February. Spikes for the weight metric occurred in September, January, and February. Increases in this latter metric showed that actions or transport involved larger, denser materials.

Figure 4. Current & Prior Year Monthly Trash Loading, MC1

Data sheets for MC1 were reviewed to gain information about the materials behind the spike increases. This evaluation produced mixed indications. In January for example, there were 5 sporting goods, and 6 plastic bottles. These types of litter are suggestive of random occurrences. February, in contrast, had a high number of litter was comprised by a diverse array of categories. This suggests storm-related transport of a general assortment of dispersed litter.

Timing also plays an important factor in trash loading at MC1 that may favor extreme weather event transport. BMPs such as volunteer cleanup of non-point source trash and street sweeping have reduced accumulations of trash. Despite much of the accumulated litter being removed from creek areas newly deposited materials could be quickly transported during storm periods before being removed by a BMP.

A total piece count for winter months (October-March) versus summer (April-September) provides a seasonal comparison for MC1. This evaluation will help gain further indication if high-loading patterns exist owing to extreme weather transport or increases in available recreation time from school breaks or increased activity levels from warmer temperatures. Analysis of the differences in piece counts in summer and winter months are shown in Table 4.

Table 4. Comparison of Seasonal Counts at MC1

Collection Period	Piece Count Summer Months	Piece Count Winter Months
2012-2013	111	97
2013-2014	83	102
2014-2015	48	81

These data do not show that there is a consistently greater loading of litter pieces during the winter months. This is an indication that extreme weather transport is just one factor that leads to litter and trash loading at Medea Creek.

An analysis of monthly loading at MC1 over multiple years may give additional understanding of the randomness of monthly loading. Table 5 shows a multi-year comparison of monthly piece counts.

January is a peak discharge month for all years. May and October are both at spike loading level (≥ 20 pieces) for two of the three years. It is premature to conclude what these slight trends may indicate.

Table 5. Monthly Loading Comparison - Multiple Years, Medea Creek

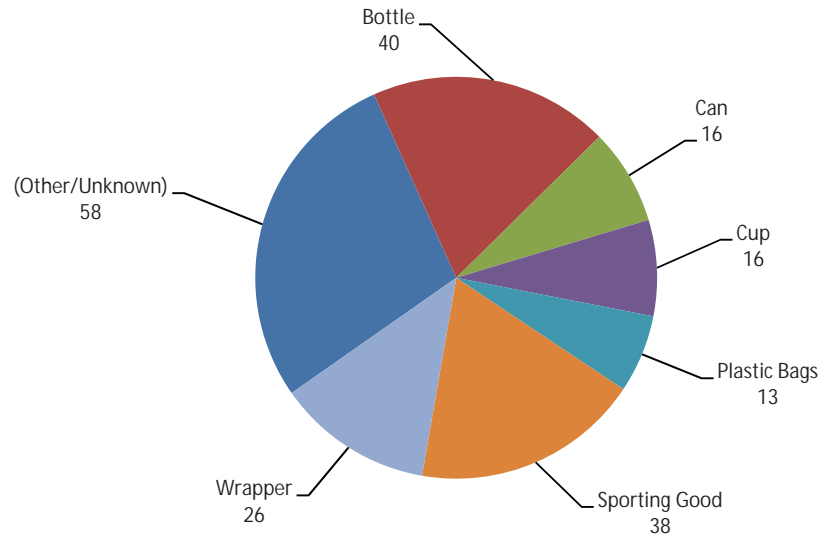
Month	Pieces Collected at Medea Creek		
	2012-2013	2013-2014	2014-2015
July	9	16	0
August	8	10	6
September	11	19	10
October	20	24	1
November	11	11	7
December	2	2	12
January	36	21	29
February	18	32	30
March	10	12	2
April	11	4	4
May	20	23	3
June	7	5	1

At both sites, litter's presence appears to be caused by an interplay of factors such as weather intensities, timing and amount of littering, and BMP location and type. Nevertheless, evaluation of trash loading could lead to the discovery of trash loading sources that are controllable.

Trash Profile: High Frequency Categories

Reviewing the relative contribution of litter by category indicates the types of litter and the relative contribution of each to the annual loading. Figures 5 and 6 depict the relative amounts of annual trash by category for Lindero Creek and Malibu Creek, respectively. Small, unidentifiable scraps of paper and plastic designated as Other/Unknown were still a sizable presence as a category at LC1. Such lightweight and therefore easily transported materials may be difficult to eliminate. Different BMP approaches will need to be considered to reduce this category.

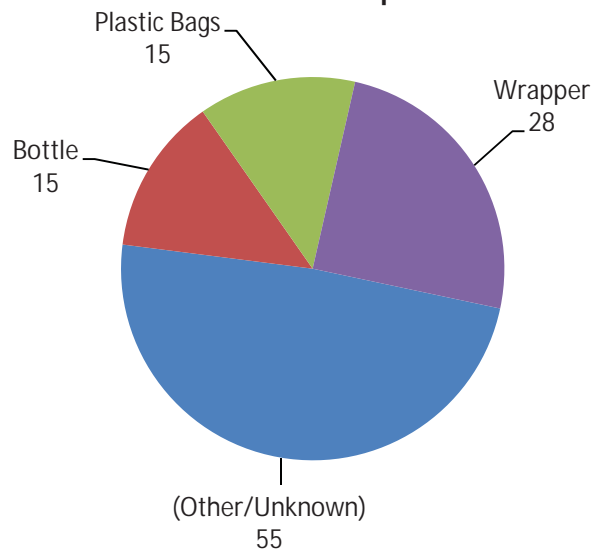
Figure 5. Lindero Creek Trash Composition



Trash Categories at Lindero Creek

There was also a large amount of sports equipment and plastic water bottles that were found at the assessment site. Improvement was seen by there being four fewer litter categories than the previous year. Additionally, there was a 43% reduction in plastic bags over the previous year.

Figure 6. Medea Creek Trash Composition



Trash Categories at Medea Creek

Small unidentifiable scraps of various materials designated as Other/Unknown was the largest type of litter collected at MC1. As mentioned, this is a highly transportable type of litter. Different BMP approaches will need to be considered to reduce this category.

Showing improvement, there were five fewer categories of trash including a negligible presence of shattered glass and cigarettes butts. There was also a 43% reduction in the amount of plastic bags that were collected (identical to Lindero Creek).

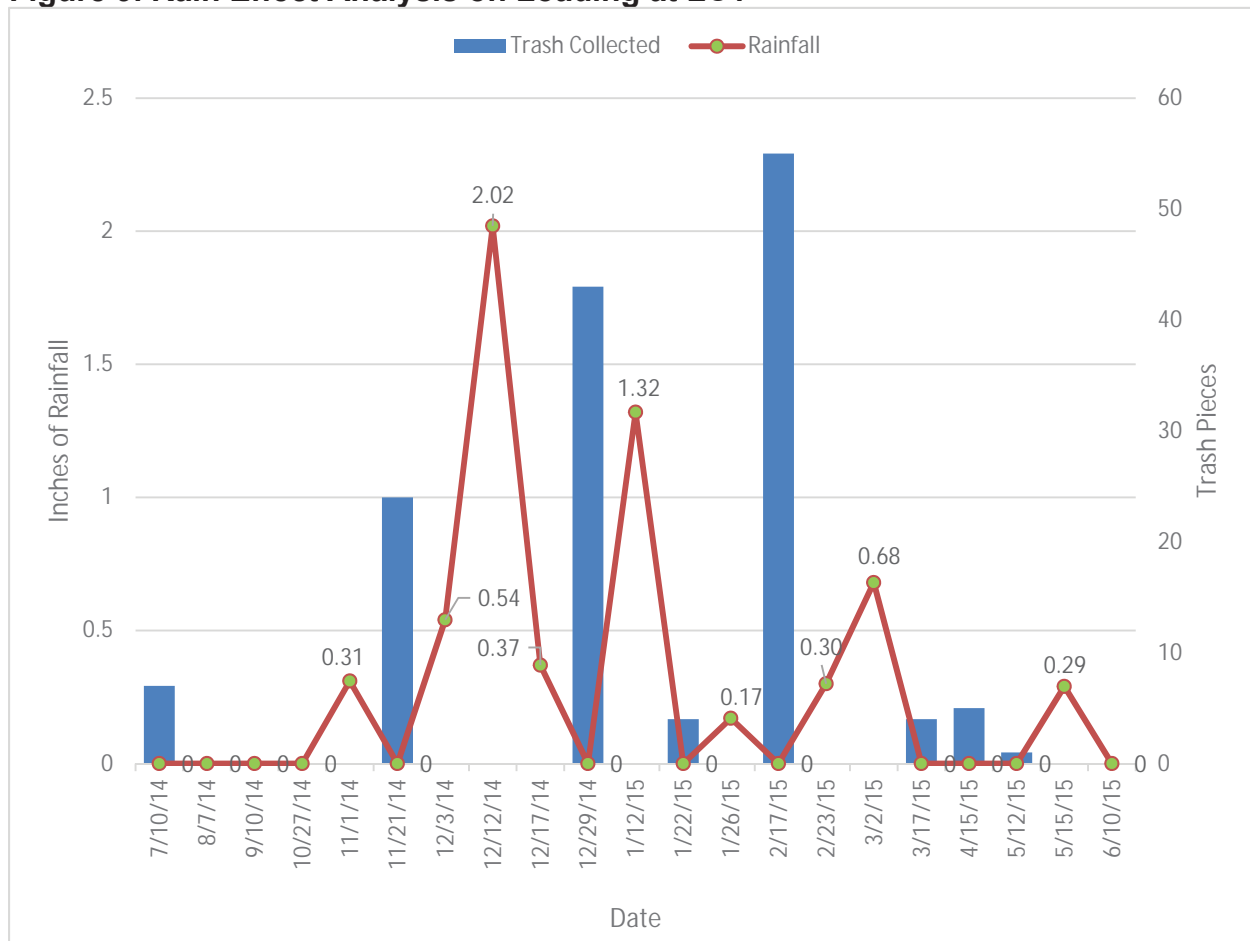
Extreme Weather Events

All extreme weather events were tracked so that a comparison could be made with monthly loading values to determine if a correlation exist between them. This year had more extreme wind events so the cut-off point was raised to greater or equal to 20 mile per hour average wind. Additionally, the threshold of rain events was raised to be at or above 0.15" because there were more events that had greater intensity. This change was made because it was presumed that more extreme weather events would transport greater amounts of trash and produce stronger correlations. Note that when rain occurred on consecutive days, best efforts were taken to determine the maximum amount that occurred over a 24-hour period. Table 6 summarizes the significant weather events.

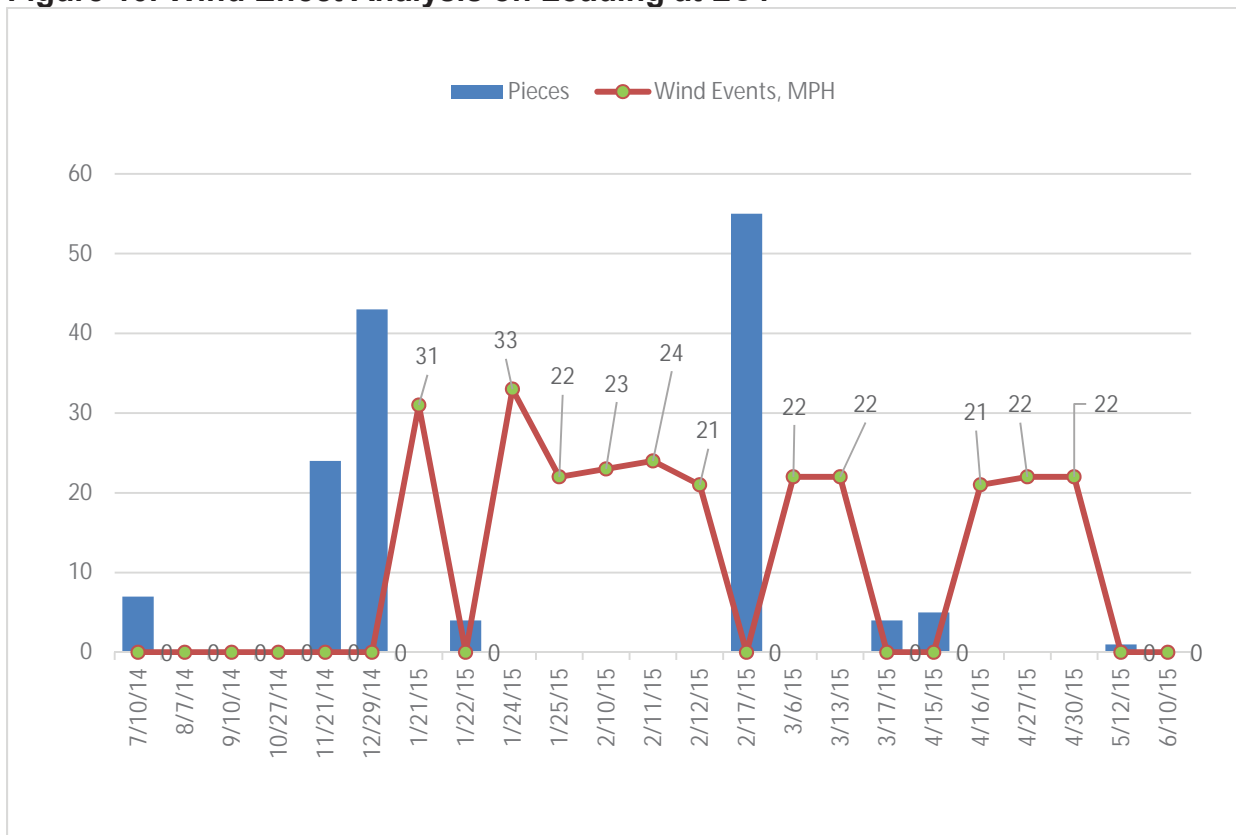
Table 6. Extreme Wind and Rain Events

Wind Events		Rain Events	Wind Events		Rain Events
Date	Speed, ≥ 20 mph	Volume ≥0.15"	Date	Speed, ≥ 20 mph	Volume ≥0.15"
11/1/14		0.31	2/11/15	24	
12/3/14		0.54	2/12/15	21	
12/12/14		2.02	2/23/15		0.30
12/17/14		0.37	3/2/15		0.68
1/12/15		1.32	3/6/15	22	
1/21/15	31		3/13/15	22	
1/24/15	33		4/16/15	21	
1/25/15	22		4/27/15	22	
1/26/15		0.17	4/30/15	22	
2/10/15	23		5/15/15		0.29

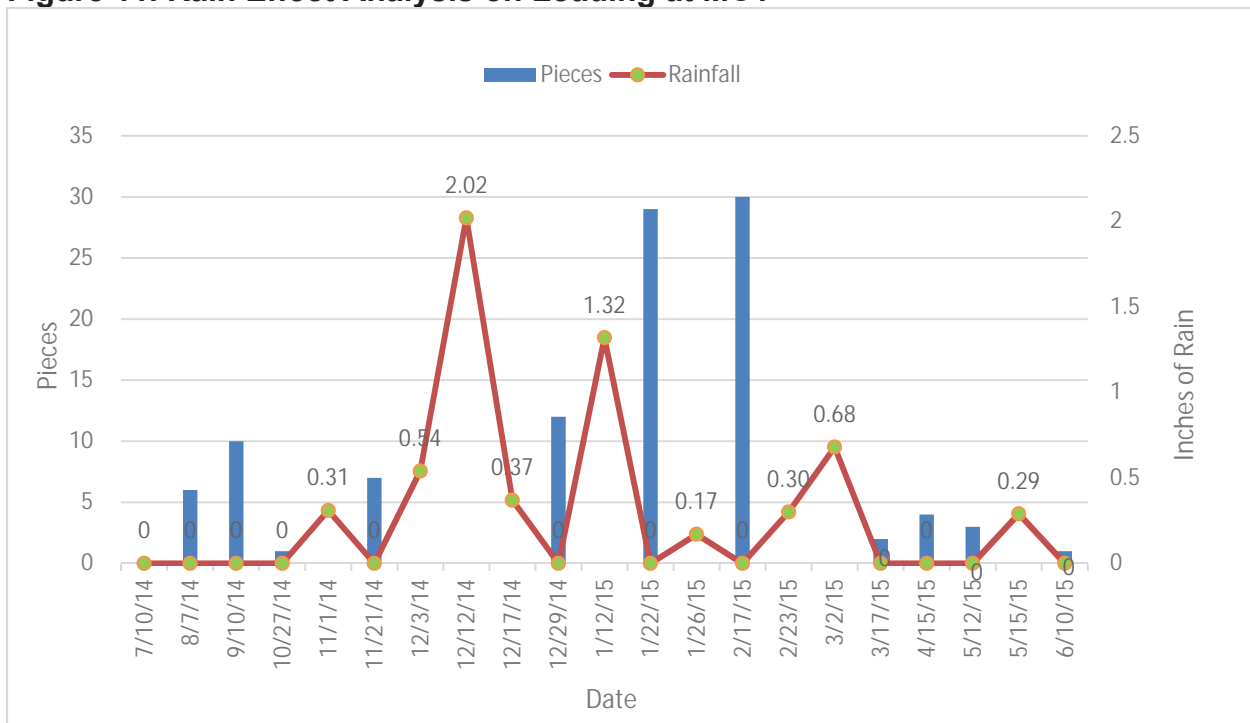
To further evaluate the possibility that extreme weather was a causative factor for the peaks in monthly metrics (November, December, and February at LC1 and December, January, and February at MC1), Figures 9, 10, 11, and 12 graphically depict the intensities of weather events in addition to piece counts from the site assessments.

Figure 9. Rain Effect Analysis on Loading at LC1

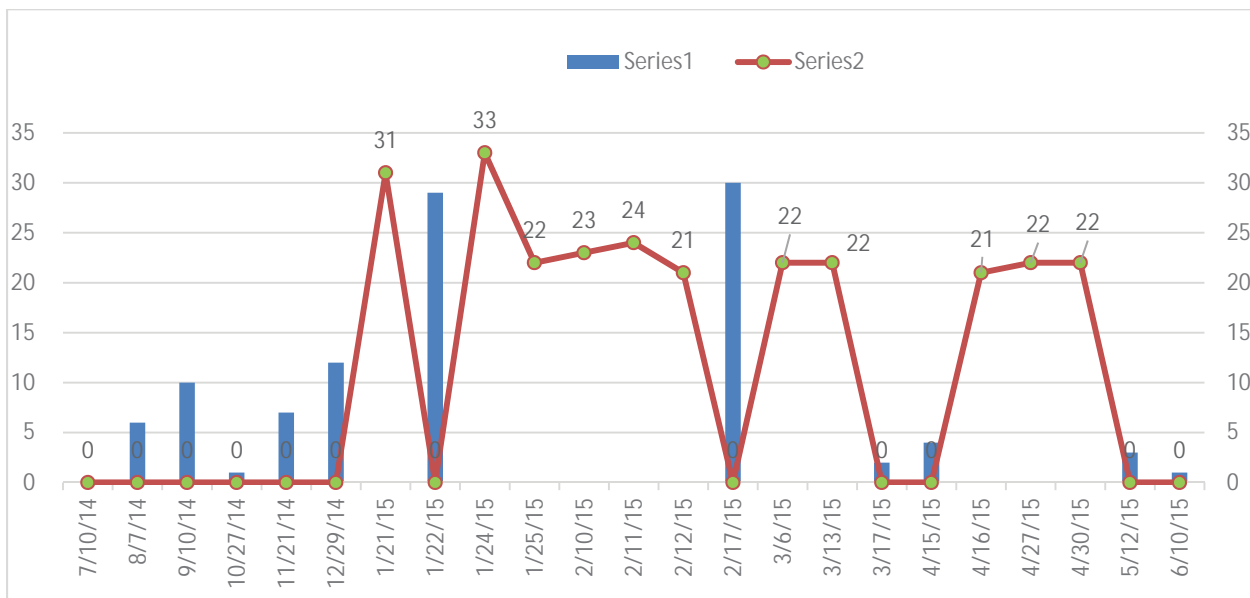
At LC1, November and December site collection counts show a clear response to the high intensity rain events that preceded them. The collection count in January does not respond to the preceding rain event. This may be because accumulations were largely removed by BMPs or depleted by earlier storm action. February's collection had an extreme peak loading, but a much smaller preceding storm. This suggests that additional factors were involved, such as abnormally high random littering. These data show that rain events can be a significant factor in the movement and deposition of trash and litter.

Figure 10. Wind Effect Analysis on Loading at LC1

For clarity, wind events were examined separately as an additional factor that could enhance litter transport in the Lindero Creek subwatershed. For example, high-winds may provide an explanation for the unusually high loading in February, given the relatively small, preceding rain event. This is because high winds themselves can be an additional loading factor by blowing trash during any handling activities such as trash collection. While there might be minimal trash lost to the environment normally, strong winds are likely to increase inadvertent releases. With this in mind, the high-wind events in January and February could have been the source and transport of litter so a plethora was available for transport to the MS4 by a smaller storm.

Figure 11. Rain Effect Analysis on Loading at MC1

At MC1, piece count spikes followed rain events in December and January. The first anomaly in the pattern of rain events increasing counts of collected litter is February's collection. February had the largest piece count spike of the year, but it was preceded by a relatively small rain event. The second anomaly is that storms in November, March, and May had little response to sizable rain events.

Figure 12. Wind Effect Analysis on Piece Loading at MC1

At MC1, as with the other site, a high wind pattern provides a plausible explanation for inconsistencies with rain events producing increases in loading. A relatively small rain

toward the end of January produced a large spike in piece count. Apparently, the high winds created the opportunity for an ample supply of litter that the rain then transported into the MS4. Similarly, high wind in January appears to have worked in concert with the rain to result in one of the largest spikes of the year at about 28 pieces.

Speaking for both sites in recap, rain and wind events alone cannot be used to predict and control loading levels. If there is a supply of litter available, even small rain storms can cause significant transport into the MS4.

Annual Trash and Debris Loading

The amount of litter collected at the assessment sites each month is summarized in Table 7. Annual totals are included so that these values can be compared to the point source WLAs in effect at each site.

Table 7. Annual Trash Loading at LC1 and MC1

Data Compliance	Lindero Creek			Medea Creek		
	Pieces	Vol., c.f.	Weight, pounds	Pieces	Vol., c.f.	Weight, pounds
Baseline WLAs	902	13.4	69	970	7.2	16.3
40% Reduction due 7/7/2014	541	8.3	41.4	582	4.3	9.8
2014-15 Annual Loading	143	2.5	20.8	105	1.7	9.4
% Reduction from Baseline	84%	81%	70%	89%	76%	42%

Waste Load Allocation Compliance

Annual loading values at the assessment sites were compared with the point source WLA values for each of the three metrics at the Lindero and Medea Creek assessments sites (Table 8).

Data in Table 8 show that assessment sites LC1 and MC1 meet the point source WLAs for all trash and litter metrics.

Table 8. WLA versus Trash Loading

Date	Site: LC1			Site: MC1		
	Piece Count	Vol., c.f.	Weight lbs.	Piece Count	Vol., c.f.	Weight lbs.
7/10/14	7	0.1	0.8	0	0	0
8/7/14	0	0.2	2.4	6	0.1	0.1
9/10/14	0	0	0	10	0.2	1.8
10/29/14	0	0	0	1	0.1	0.1
11/21/14	24	0.5	2.9	7	0.2	0.6
12/29/14	43	0.7	8.1	12	0.1	0.1
1/22/15	4	0.1	0.8	29	0.7	4.3
2/17/15	55	0.7	3.6	30	0.2	1.9
3/17/15	4	0.1	1.3	2	0	0.1
4/15/15	5	0.1	0.8	4	0.1	0.2
5/12/15	1	0	0.1	3	0	0.1
6/10/15	0	0	0	1	0	0.1
Total	143	2.5	20.8	105	1.7	9.4

Ongoing volunteer trash cleanups in the vicinity of LC1 and MC1 have been reducing accumulations of litter. Secondly, there is zero trash in areas within proximity of the assessment area after an MFAC event. Therefore, non-point sources meet load allocations and TMDL responsible parties are in compliance.

BMP Evaluation

Existing BMPs are done over the course of the year and are reasonably effective at preventing an accumulation of trash in most areas. The BMPs currently in use in areas surrounding and including assessment sites LC-1 and MC-1 are itemized as follows:

City of Thousand Oaks Litter Reduction Measures:

- Catch basin cleaning - Catch basins are inspected annually. If trash has accumulated to 25% or more of the unit's capacity, it is cleaned by a vector truck.
- Street sweeping - All residential areas (public and private) are swept 19 times per year and commercial areas are swept once per week.

- Open channel storm drain maintenance: All city-maintained channels are inspected and cleaned as required once per year, prior to the wet season.
- Public Event Litter Control - A recycling plan is required when obtaining a permit for staging public events. This plan requires adequate facilities for trash collection and disposal and reclamation of recyclable materials.
- Public areas - Trash receptacles have been placed at public use areas. These devices are monitored and emptied regularly.
- Freeway Ramp and Interchange Collection Program - The City pays for trash and debris collection at freeway on-ramps and exits and from the freeway interchange.
- Free Landfill Day - The City sponsors two days one in April and one in September when residents may take waste and recyclables, including electronics, to the Simi Valley Landfill for free disposal.
- The City-sponsored "Neighborhood Cleanup Program" provides 40-yard dumpsters and free disposal to residential neighborhoods desiring to organize and conduct cleanup events.
- Residents may safely and legally dispose of household hazardous waste at the City's Hazardous Waste Collection Facility on Fridays and Saturdays. In addition, the City provides household battery collection services at twelve locations.
- Thousand Oaks residents may dispose of up to four "bulky items" per year, such as appliances, mattresses and old furniture, simply by calling their trash company and arranging for free pickup.
- Thousand Oaks Municipal Code Sec.7-8.201 (7) prohibits the disposal and accumulation of trash in public and private areas.
- Catch basins are labeled "Drains to Creek, Do Not Dump" or "Drains to Lake, Do Not Dump."
- Public outreach/education addressing trash pollution is conducted at multiple public events, through radio and newspapers ads, and on the City's website.
- Utility bill inserts - Promotional inserts are used to advertise Coastal Clean-up Day, Community Clean-up Day, Free Landfill Day, and other City-sponsored trash reduction/clean-up programs.

County of Ventura and VCWPD Litter Management Program:

- Catch basin cleaning - Catch basins are inspected at least once a year and cleaned when filled to 25% or more of the catch basin's capacity. During the storm season, all drainage facilities are inspected and cleaned as necessary.
- Ventura County's catch basins are labeled, "Don't Pollute, Flows to Waterways."
- Open channel storm drain maintenance - All channels owned and maintained by VCWPD are cleared, inspected, and cleaned as required, at least once per year.
- Trash Management at Public Events - A trash and litter management plan is required when obtaining a permit for staging public events. This plan requires adequate facilities for trash collection and disposal.
- Public areas - Trash receptacles have been placed within high trash generation areas. These devices are cleaned and maintained regularly to prevent trash overflow.
- The amended Ventura County Stormwater Quality Management Ordinance for Unincorporated Areas (Ventura County Ordinance No. 4450) has been in effect since August 2012. It includes litter and trash specific prohibitions (§ 6942) on the discharge or deposition of trash that may enter the County storm drain system or receiving waters. The revised ordinance ~~also~~ includes increased civil penalties for violations and provisions for issuing administrative fines, recovery of costs, and misdemeanor violations.
- The County and VCWPD participate in the Ventura Countywide Stormwater Quality Management Program that provides outreach and education facilitated by contracted services from "The Agency," a professional advertisement group that designs and conducts countywide, bilingual outreach programs advocating proper trash disposal. Outreach includes social media messages about litter prevention and the protection of stormwater quality.
- The County conducts commercial, industrial, and construction facility/site inspections to ensure pollution prevention BMPs are adequate and maintained and to educate employees about the importance of pollution prevention.
- The County completed a site suitability analysis study of both land use and the storm drain system to determine County owned catch basins requiring installation of full capture devices. This analysis included field reconnaissance findings with key information pertaining to physical measurements, photos, and field sketches, in addition to required drainage area delineation and hydrology calculations.
- Big Sunday Event May 1, 2016. It was another event under on-going program "Annual Big Sunday Trash Removal and Catch Basin Stenciling" (first Sunday of each May) organized by the Oak Park Unified School District, see Appendix A.

Recommended BMP Modifications

Ongoing activities by each responsible agency continue to assess and improve litter control in urban and recreational areas.

Lindero Creek

- Evaluate catch basin loading to evaluate full-capture devices at the locations with a high accumulation.
- Consider additional street sweeping after high-wind periods.

Medea Creek

Additional BMPs:

- County successfully secured funding under Proposition 84 Storm Water Grant Program Round 2 for the Oak Park Green Streets Urban Retrofit project. Ten modular wetlands and two biofilters will be installed in the Oak Park located within Medea Creek subdrainage area. Project construction is currently scheduled for summer 2017.
- Using findings of the recently completed Site Suitability Analysis for full trash capture devices, the County is moving forward with design and installation of full trash capture devices in the areas designated as high trash areas to meet point source WLAs compliance; the installation is scheduled for spring of 2017.

MFAC Program Changes

No changes to the MFAC plan are currently recommended.

Appendix A



2016 Big Sunday Participant Photo



Catch Basin Stenciling

August 15, 2016

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Cosío, Director

Engineering Services Department
Christopher E. Cooper, Director

Transportation Department
David L. Fleisch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Tully K. Clifford, Director

**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND OAKS**

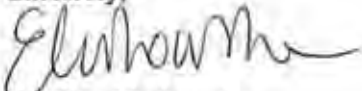
Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of July 2016. Sites were sampled weekly on Tuesdays (July 12, 19 and 26), except for one instance when sites were sampled on Wednesday (July 6) due to staffing conflicts. Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 645-1382.

Sincerely,



Ewelina Mutkowska

County Stormwater Program Manager, Watershed Protection District

CC: Tully Clifford, Watershed Protection District
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	-	7/6/2016 ♦			Dry
MCW-8b	-	7/12/2016 ♦			Dry
MCW-8b	-	7/19/2016 ♦			Dry
MCW-8b	-	7/26/2016 ♦			Dry
MCW-9	-	7/6/2016 ♦			Dry
MCW-9	-	7/12/2016 ♦			Dry
MCW-9	-	7/19/2016 ♦			Dry
MCW-9	-	7/26/2016 ♦			Dry
MCW-12	-	7/6/2016 ♦			Dry
MCW-12	-	7/12/2016 ♦			Dry
MCW-12	-	7/19/2016 ♦			Dry
MCW-12	-	7/26/2016 ♦			Dry
MCW-14b	910	7/6/2016 ♦		=	70
MCW-14b	1030	7/12/2016 ♦		<	20
MCW-14b	915	7/19/2016 ♦		<	20
MCW-14b	840	7/26/2016 ♦		=	80
MCW-15c	830	7/6/2016 ♦		=	80
MCW-15c	930	7/12/2016 ♦		=	300
MCW-15c	955	7/19/2016 ♦		=	500
MCW-15c	915	7/26/2016 ♦		=	40
MCW-17	-	7/6/2016 ♦			Dry
MCW-17	-	7/12/2016 ♦			Dry
MCW-17	-	7/19/2016 ♦			Dry
MCW-17	-	7/26/2016 ♦			Dry
MCW-18	-	7/6/2016 ♦			Dry
MCW-18	-	7/12/2016 ♦			Dry
MCW-18	-	7/19/2016 ♦			Dry
MCW-18	-	7/26/2016 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-8b	-	7/1/2016	Dry	<	10	10
MCW-8b	-	7/2/2016	Dry	<	10	10
MCW-8b	-	7/3/2016	Dry	<	10	10
MCW-8b	-	7/4/2016	Dry	<	10	10
MCW-8b	-	7/5/2016	Dry	<	10	10
MCW-8b	-	7/6/2016♦	Dry	<	10	10
MCW-8b	-	7/7/2016	Dry	<	10	10
MCW-8b	-	7/8/2016	Dry	<	10	10
MCW-8b	-	7/9/2016	Dry	<	10	10
MCW-8b	-	7/10/2016	Dry	<	10	10
MCW-8b	+	7/11/2016	Dry	<	10	10
MCW-8b	-	7/12/2016♦	Dry	<	10	10
MCW-8b	-	7/13/2016	Dry	<	10	10
MCW-8b	-	7/14/2016	Dry	<	10	10
MCW-8b	-	7/15/2016	Dry	<	10	10
MCW-8b	+	7/16/2016	Dry	<	10	10
MCW-8b	-	7/17/2016	Dry	<	10	10
MCW-8b	-	7/18/2016	Dry	<	10	10
MCW-8b	-	7/19/2016♦	Dry	<	10	10
MCW-8b	-	7/20/2016	Dry	<	10	10
MCW-8b	-	7/21/2016	Dry	<	10	10
MCW-8b	-	7/22/2016	Dry	<	10	10
MCW-8b	+	7/23/2016	Dry	<	10	10
MCW-8b	-	7/24/2016	Dry	<	10	10
MCW-8b	+	7/25/2016	Dry	<	10	10
MCW-8b	-	7/26/2016♦	Dry	<	10	10
MCW-8b	-	7/27/2016	Dry	<	10	10
MCW-8b	-	7/28/2016	Dry	<	10	10
MCW-8b	-	7/29/2016	Dry	<	10	10
MCW-8b	+	7/30/2016	Dry	<	10	10
MCW-8b	-	7/31/2016	Dry	<	10	10
MCW-9	-	7/1/2016	Dry	<	10	10
MCW-9	-	7/2/2016	Dry	<	10	10
MCW-9	-	7/3/2016	Dry	<	10	10
MCW-9	-	7/4/2016	Dry	<	10	10
MCW-9	-	7/5/2016	Dry	<	10	10
MCW-9	-	7/6/2016♦	Dry	<	10	10
MCW-9	-	7/7/2016	Dry	<	10	10
MCW-9	-	7/8/2016	Dry	<	10	10
MCW-9	-	7/9/2016	Dry	<	10	10
MCW-9	-	7/10/2016	Dry	<	10	10
MCW-9	-	7/11/2016	Dry	<	10	10
MCW-9	-	7/12/2016♦	Dry	<	10	10
MCW-9	-	7/13/2016	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-9	-	7/12/2016♦	Dry	<	10	10
MCW-9	-	7/13/2016	Dry	<	10	10
MCW-9	-	7/14/2016	Dry	<	10	10
MCW-9	-	7/15/2016	Dry	<	10	10
MCW-9	-	7/16/2016	Dry	<	10	10
MCW-9	-	7/17/2016	Dry	<	10	10
MCW-9	-	7/18/2016	Dry	<	10	10
MCW-9	-	7/19/2016♦	Dry	<	10	10
MCW-9	-	7/20/2016	Dry	<	10	10
MCW-9	-	7/21/2016	Dry	<	10	10
MCW-9	-	7/22/2016	Dry	<	10	10
MCW-9	-	7/23/2016	Dry	<	10	10
MCW-9	-	7/24/2016	Dry	<	10	10
MCW-9	-	7/25/2016	Dry	<	10	10
MCW-9	-	7/26/2016♦	Dry	<	10	10
MCW-9	-	7/27/2016	Dry	<	10	10
MCW-9	-	7/28/2016	Dry	<	10	10
MCW-9	-	7/29/2016	Dry	<	10	10
MCW-9	-	7/30/2016	Dry	<	10	10
MCW-9	-	7/31/2016	Dry	<	10	10
MCW-12	-	7/1/2016	Dry	<	10	10
MCW-12	-	7/2/2016	Dry	<	10	10
MCW-12	-	7/3/2016	Dry	<	10	10
MCW-12	-	7/4/2016	Dry	<	10	10
MCW-12	-	7/5/2016	Dry	<	10	10
MCW-12	-	7/6/2016♦	Dry	<	10	10
MCW-12	-	7/7/2016	Dry	<	10	10
MCW-12	-	7/8/2016	Dry	<	10	10
MCW-12	-	7/9/2016	Dry	<	10	10
MCW-12	-	7/10/2016	Dry	<	10	10
MCW-12	-	7/11/2016	Dry	<	10	10
MCW-12	-	7/12/2016♦	Dry	<	10	10
MCW-12	-	7/13/2016	Dry	<	10	10
MCW-12	-	7/14/2016	Dry	<	10	10
MCW-12	-	7/15/2016	Dry	<	10	10
MCW-12	-	7/16/2016	Dry	<	10	10
MCW-12	-	7/17/2016	Dry	<	10	10
MCW-12	-	7/18/2016	Dry	<	10	10
MCW-12	-	7/19/2016♦	Dry	<	10	10
MCW-12	-	7/20/2016	Dry	<	10	10
MCW-12	-	7/21/2016	Dry	<	10	10
MCW-12	-	7/22/2016	Dry	<	10	10
MCW-12	-	7/23/2016	Dry	<	10	10
MCW-12	-	7/24/2016	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(125 MPN)
MCW-12	-	7/25/2016	Dry	<	10	10
MCW-12	-	7/26/2016♦	Dry	<	10	10
MCW-12	-	7/27/2016	Dry	<	10	10
MCW-12	-	7/28/2016	Dry	<	10	10
MCW-12	-	7/29/2016	Dry	<	10	10
MCW-12	-	7/30/2016	Dry	<	10	10
MCW-12	-	7/31/2016	Dry	<	10	10
MCW-14b	715	7/1/2016		=	500	86
MCW-14b	715	7/2/2016		=	500	91
MCW-14b	715	7/3/2016		=	500	97
MCW-14b	715	7/4/2016		=	500	103
MCW-14b	715	7/5/2016		=	500	109
MCW-14b	910	7/6/2016♦		=	70	109
MCW-14b	910	7/7/2016		=	70	111
MCW-14b	910	7/8/2016		=	70	113
MCW-14b	910	7/9/2016		=	70	115
MCW-14b	910	7/10/2016		=	70	117
MCW-14b	910	7/11/2016		=	70	119
MCW-14b	1030	7/12/2016♦		<	10	114
MCW-14b	1030	7/13/2016		<	10	109
MCW-14b	1030	7/14/2016		<	10	97
MCW-14b	1030	7/15/2016		<	10	87
MCW-14b	1030	7/16/2016		<	10	77
MCW-14b	1030	7/17/2016		<	10	69
MCW-14b	1030	7/18/2016		<	10	62
MCW-14b	915	7/19/2016♦		<	10	55
MCW-14b	915	7/20/2016		<	10	49
MCW-14b	915	7/21/2016		<	10	48
MCW-14b	915	7/22/2016		<	10	47
MCW-14b	915	7/23/2016		<	10	46
MCW-14b	915	7/24/2016		<	10	45
MCW-14b	915	7/25/2016		<	10	44
MCW-14b	840	7/26/2016♦		=	80	46
MCW-14b	840	7/27/2016		=	80	48
MCW-14b	840	7/28/2016		=	80	45
MCW-14b	840	7/29/2016		=	80	43
MCW-14b	840	7/30/2016		=	80	40
MCW-14b	840	7/31/2016		=	80	38
MCW-15c	755	7/1/2016		=	110	42
MCW-15c	755	7/2/2016		=	110	42
MCW-15c	755	7/3/2016		=	110	43
MCW-15c	755	7/4/2016		=	110	43
MCW-15c	755	7/5/2016		=	110	43
MCW-15c	830	7/6/2016♦		=	80	43
MCW-15c	830	7/7/2016		=	80	43

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Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-15c	830	7/8/2016		=	80	42
MCW-15c	830	7/9/2016		=	80	41
MCW-15c	830	7/10/2016		=	80	41
MCW-15c	830	7/11/2016		=	80	40
MCW-15c	930	7/12/2016 ♦		=	300	41
MCW-15c	930	7/13/2016		=	300	42
MCW-15c	930	7/14/2016		=	300	47
MCW-15c	930	7/15/2016		=	300	53
MCW-15c	930	7/16/2016		=	300	60
MCW-15c	930	7/17/2016		=	300	67
MCW-15c	930	7/18/2016		=	300	75
MCW-15c	955	7/19/2016 ♦		=	500	85
MCW-15c	955	7/20/2016		=	500	97
MCW-15c	955	7/21/2016		=	500	108
MCW-15c	955	7/22/2016		=	500	120
MCW-15c	955	7/23/2016		=	500	134
MCW-15c	955	7/24/2016		=	500	149
MCW-15c	955	7/25/2016		=	500	166
MCW-15c	915	7/26/2016 ♦		=	40	170
MCW-15c	915	7/27/2016		=	40	174
MCW-15c	915	7/28/2016		=	40	168
MCW-15c	915	7/29/2016		=	40	162
MCW-15c	915	7/30/2016		=	40	157
MCW-15c	915	7/31/2016		=	40	152
MCW-17	-	7/1/2016	Dry	<	10	10
MCW-17	-	7/2/2016	Dry	<	10	10
MCW-17	-	7/3/2016	Dry	<	10	10
MCW-17	-	7/4/2016	Dry	<	10	10
MCW-17	-	7/5/2016	Dry	<	10	10
MCW-17	-	7/6/2016 ♦	Dry	<	10	10
MCW-17	-	7/7/2016	Dry	<	10	10
MCW-17	-	7/8/2016	Dry	<	10	10
MCW-17	-	7/9/2016	Dry	<	10	10
MCW-17	-	7/10/2016	Dry	<	10	10
MCW-17	-	7/11/2016	Dry	<	10	10
MCW-17	-	7/12/2016 ♦	Dry	<	10	10
MCW-17	-	7/13/2016	Dry	<	10	10
MCW-17	-	7/14/2016	Dry	<	10	10
MCW-17	-	7/15/2016	Dry	<	10	10
MCW-17	-	7/16/2016	Dry	<	10	10
MCW-17	-	7/17/2016	Dry	<	10	10
MCW-17	-	7/18/2016	Dry	<	10	10
MCW-17	-	7/19/2016 ♦	Dry	<	10	10
MCW-17	-	7/20/2016	Dry	<	10	10
MCW-17	-	7/21/2016	Dry	<	10	10
MCW-17	-	7/22/2016	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-17	-	7/23/2016	Dry	<	10	10
MCW-17	-	7/24/2016	Dry	<	10	10
MCW-17	-	7/25/2016	Dry	<	10	10
MCW-17	-	7/26/2016	Dry	<	10	10
MCW-17	-	7/27/2016	Dry	<	10	10
MCW-17	-	7/28/2016	Dry	<	10	10
MCW-17	-	7/29/2016	Dry	<	10	10
MCW-17	-	7/30/2016	Dry	<	10	10
MCW-17	-	7/31/2016	Dry	<	10	10
MCW-18	-	7/1/2016	Dry	<	10	10
MCW-18	-	7/2/2016	Dry	<	10	10
MCW-18	-	7/3/2016	Dry	<	10	10
MCW-18	-	7/4/2016	Dry	<	10	10
MCW-18	-	7/5/2016	Dry	<	10	10
MCW-18	-	7/6/2016 ♦	Dry	<	10	10
MCW-18	-	7/7/2016	Dry	<	10	10
MCW-18	-	7/8/2016	Dry	<	10	10
MCW-18	-	7/9/2016	Dry	<	10	10
MCW-18	-	7/10/2016	Dry	<	10	10
MCW-18	-	7/11/2016	Dry	<	10	10
MCW-18	-	7/12/2016 ♦	Dry	<	10	10
MCW-18	-	7/13/2016	Dry	<	10	10
MCW-18	-	7/14/2016	Dry	<	10	10
MCW-18	-	7/15/2016	Dry	<	10	10
MCW-18	-	7/16/2016	Dry	<	10	10
MCW-18	-	7/17/2016	Dry	<	10	10
MCW-18	-	7/18/2016	Dry	<	10	10
MCW-18	-	7/19/2016 ♦	Dry	<	10	10
MCW-18	-	7/20/2016	Dry	<	10	10
MCW-18	-	7/21/2016	Dry	<	10	10
MCW-18	-	7/22/2016	Dry	<	10	10
MCW-18	-	7/23/2016	Dry	<	10	10
MCW-18	-	7/24/2016	Dry	<	10	10
MCW-18	-	7/25/2016	Dry	<	10	10
MCW-18	-	7/26/2016 ♦	Dry	<	10	10
MCW-18	-	7/27/2016	Dry	<	10	10
MCW-18	-	7/28/2016	Dry	<	10	10
MCW-18	-	7/29/2016	Dry	<	10	10
MCW-18	-	7/30/2016	Dry	<	10	10
MCW-18	-	7/31/2016	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



September 19, 2016

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Coslo, Director

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Tully K. Clifford, Director

**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND
OAKS**

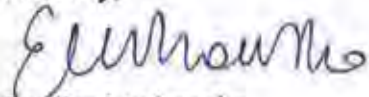
Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of August 2016. Sites were sampled weekly on Tuesdays (August 2, 9, 16, 23 and 30). Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 645-1382.

Sincerely,



Ewelina Mutkowska
County Stormwater Program Manager, Watershed Protection District

CC: Tully Clifford, Watershed Protection District
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	-	8/2/2016 ♦			Dry
MCW-8b	-	8/9/2016 ♦			Dry
MCW-8b	-	8/16/2016 ♦			Dry
MCW-8b	-	8/23/2016 ♦			Dry
MCW-8b	-	8/30/2016 ♦			Dry
MCW-9	-	8/2/2016 ♦			Dry
MCW-9	-	8/9/2016 ♦			Dry
MCW-9	-	8/16/2016 ♦			Dry
MCW-9	-	8/23/2016 ♦			Dry
MCW-9	-	8/30/2016 ♦			Dry
MCW-12	-	8/2/2016 ♦			Dry
MCW-12	-	8/9/2016 ♦			Dry
MCW-12	-	8/16/2016 ♦			Dry
MCW-12	935	8/23/2016 ♦		=	170**
MCW-12	-	8/30/2016 ♦			Dry
MCW-14b	925	8/2/2016 ♦		=	40
MCW-14b	930	8/9/2016 ♦		=	500
MCW-14b	920	8/16/2016 ♦		<	20
MCW-14b	1100	8/23/2016 ♦		=	16,000
MCW-14b	1020	8/30/2016 ♦		=	130
MCW-15c	1000	8/2/2016 ♦		=	230
MCW-15c	845	8/9/2016 ♦		=	1,300
MCW-15c	840	8/16/2016 ♦		=	800
MCW-15c	830	8/23/2016 ♦		=	500
MCW-15c	945	8/30/2016 ♦		=	2,400
MCW-17	-	8/2/2016 ♦			Dry
MCW-17	-	8/9/2016 ♦			Dry
MCW-17	-	8/16/2016 ♦			Dry
MCW-17	-	8/23/2016 ♦			Dry
MCW-17	-	8/30/2016 ♦			Dry
MCW-18	-	8/2/2016 ♦			Dry
MCW-18	-	8/9/2016 ♦			Dry
MCW-18	-	8/16/2016 ♦			Dry
MCW-18	-	8/23/2016 ♦			Dry
MCW-18	-	8/30/2016 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

** Oak Park Water Service experienced a main pipe break discharging a large amount of water into Medea Creek resulting in flow at MCW-12. Results show that the location was in compliance. Samples could not be collected the following week due to a return to dry conditions.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-8b	-	8/1/2016	Dry	<	10	10
MCW-8b	-	8/2/2016♦	Dry	<	10	10
MCW-8b	-	8/3/2016	Dry	<	10	10
MCW-8b	-	8/4/2016	Dry	<	10	10
MCW-8b	-	8/5/2016	Dry	<	10	10
MCW-8b	-	8/6/2016	Dry	<	10	10
MCW-8b	-	8/7/2016	Dry	<	10	10
MCW-8b	-	8/8/2016	Dry	<	10	10
MCW-8b	-	8/9/2016♦	Dry	<	10	10
MCW-8b	-	8/10/2016	Dry	<	10	10
MCW-8b	-	8/11/2016	Dry	<	10	10
MCW-8b	-	8/12/2016	Dry	<	10	10
MCW-8b	-	8/13/2016	Dry	<	10	10
MCW-8b	-	8/14/2016	Dry	<	10	10
MCW-8b	-	8/15/2016	Dry	<	10	10
MCW-8b	-	8/16/2016♦	Dry	<	10	10
MCW-8b	-	8/17/2016	Dry	<	10	10
MCW-8b	-	8/18/2016	Dry	<	10	10
MCW-8b	-	8/19/2016	Dry	<	10	10
MCW-8b	-	8/20/2016	Dry	<	10	10
MCW-8b	-	8/21/2016	Dry	<	10	10
MCW-8b	-	8/22/2016	Dry	<	10	10
MCW-8b	-	8/23/2016♦	Dry	<	10	10
MCW-8b	-	8/24/2016	Dry	<	10	10
MCW-8b	-	8/25/2016	Dry	<	10	10
MCW-8b	-	8/26/2016	Dry	<	10	10
MCW-8b	-	8/27/2016	Dry	<	10	10
MCW-8b	-	8/28/2016	Dry	<	10	10
MCW-8b	-	8/29/2016	Dry	<	10	10
MCW-8b	-	8/30/2016♦	Dry	<	10	10
MCW-8b	-	8/31/2016	Dry	<	10	10
MCW-9	-	8/1/2016	Dry	<	10	10
MCW-9	-	8/2/2016♦	Dry	<	10	10
MCW-9	-	8/3/2016	Dry	<	10	10
MCW-9	-	8/4/2016	Dry	<	10	10
MCW-9	-	8/5/2016	Dry	<	10	10
MCW-9	-	8/6/2016	Dry	<	10	10
MCW-9	-	8/7/2016	Dry	<	10	10
MCW-9	-	8/8/2016	Dry	<	10	10
MCW-9	-	8/9/2016♦	Dry	<	10	10
MCW-9	-	8/10/2016	Dry	<	10	10
MCW-9	-	8/11/2016	Dry	<	10	10
MCW-9	-	8/12/2016	Dry	<	10	10
MCW-9	-	8/13/2016	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
M/W-9	-	8/14/2016	Dry	<	10	10
M/W-9	-	8/15/2016	Dry	<	10	10
M/W-9	-	8/16/2016♦	Dry	<	10	10
M/W-9	-	8/17/2016	Dry	<	10	10
M/W-9	-	8/18/2016	Dry	<	10	10
M/W-9	-	8/19/2016	Dry	<	10	10
M/W-9	-	8/20/2016	Dry	<	10	10
M/W-9	-	8/21/2016	Dry	<	10	10
M/W-9	-	8/22/2016	Dry	<	10	10
M/W-9	-	8/23/2016♦	Dry	<	10	10
M/W-9	-	8/24/2016	Dry	<	10	10
M/W-9	-	8/25/2016	Dry	<	10	10
M/W-9	-	8/26/2016	Dry	<	10	10
M/W-9	-	8/27/2016	Dry	<	10	10
M/W-9	-	8/28/2016	Dry	<	10	10
M/W-9	-	8/29/2016	Dry	<	10	10
M/W-9	-	8/30/2016♦	Dry	<	10	10
M/W-9	-	8/31/2016	Dry	<	10	10
M/W-12	-	8/1/2016	Dry	<	10	10
M/W-12	-	8/2/2016♦	Dry	<	10	10
M/W-12	-	8/3/2016	Dry	<	10	10
M/W-12	-	8/4/2016	Dry	<	10	10
M/W-12	-	8/5/2016	Dry	<	10	10
M/W-12	-	8/6/2016	Dry	<	10	10
M/W-12	-	8/7/2016	Dry	<	10	10
M/W-12	-	8/8/2016	Dry	<	10	10
M/W-12	-	8/9/2016♦	Dry	<	10	10
M/W-12	-	8/10/2016	Dry	<	10	10
M/W-12	-	8/11/2016	Dry	<	10	10
M/W-12	-	8/12/2016	Dry	<	10	10
M/W-12	-	8/13/2016	Dry	<	10	10
M/W-12	-	8/14/2016	Dry	<	10	10
M/W-12	-	8/15/2016	Dry	<	10	10
M/W-12	-	8/16/2016♦	Dry	<	10	10
M/W-12	-	8/17/2016	Dry	<	10	10
M/W-12	-	8/18/2016	Dry	<	10	10
M/W-12	-	8/19/2016	Dry	<	10	10
M/W-12	-	8/20/2016	Dry	<	10	10
M/W-12	-	8/21/2016	Dry	<	10	10
M/W-12	-	8/22/2016	Dry	<	10	10
M/W-12	935	8/23/2016♦		=	170**	26
M/W-12	935	8/24/2016		=	170**	26
M/W-12	935	8/25/2016		=	170**	29
M/W-12	935	8/26/2016		=	170**	32



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCV 12	935	8/27/2016	=	170**		35
MCV 12	935	8/28/2016	=	170**		38
MCV 12	935	8/29/2016	=	170**		42
MCV 12	935	8/30/2016♦	=	170**		46
MCV 12	-	8/31/2016	Dry	<		10
MCV 1b	840	8/1/2016	=	80		35
MCV 1b	925	8/2/2016♦	=	40		33
MCV 1b	925	8/3/2016	=	40		30
MCV 1b	925	8/4/2016	=	40		28
MCV 1b	925	8/5/2016	=	40		27
MCV 1b	925	8/6/2016	=	40		27
MCV 1b	925	8/7/2016	=	40		26
MCV 1b	925	8/8/2016	=	40		26
MCV 1b	930	8/9/2016♦	=	500		27
MCV 1b	930	8/10/2016	=	500		29
MCV 1b	930	8/11/2016	=	500		33
MCV 1b	930	8/12/2016	=	500		38
MCV 1b	930	8/13/2016	=	500		43
MCV 1b	930	8/14/2016	=	500		49
MCV 1b	930	8/15/2016	=	500		56
MCV 1b	920	8/16/2016♦	<	10		56
MCV 1b	920	8/17/2016	<	10		56
MCV 1b	920	8/18/2016	<	10		56
MCV 1b	920	8/19/2016	<	10		56
MCV 1b	920	8/20/2016	<	10		56
MCV 1b	920	8/21/2016	<	10		56
MCV 1b	920	8/22/2016	<	10		56
MCV 1b	1100	8/23/2016♦	=	16,000		72
MCV 1b	1100	8/24/2016	=	16,000		91
MCV 1b	1100	8/25/2016	=	16,000		109
MCV 1b	1100	8/26/2016	=	16,000		130
MCV 1b	1100	8/27/2016	=	16,000		155
MCV 1b	1100	8/28/2016	=	16,000		185
MCV 1b	1100	8/29/2016	=	16,000		221
MCV 1b	1020	8/30/2016♦	=	130		225
MCV 1b	1020	8/31/2016	=	130		228
MCV 1b	915	8/1/2016	=	40		147
MCV 1b	1000	8/2/2016♦	=	230		150
MCV 1b	1000	8/3/2016	=	230		154
MCV 1b	1000	8/4/2016	=	230		158
MCV 1b	1000	8/5/2016	=	230		164
MCV 1b	1000	8/6/2016	=	230		169
MCV 1b	1000	8/7/2016	=	230		175
MCV 1b	1000	8/8/2016	=	230		182
MCV 1b	845	8/9/2016♦	=	1,300		199



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
M0	845	8/10/2016		=	1,300	219
M0	845	8/11/2016		=	1,300	230
M0	845	8/12/2016		=	1,300	241
M0	845	8/13/2016		=	1,300	253
M0	845	8/14/2016		=	1,300	266
M0	845	8/15/2016		=	1,300	279
M0	840	8/16/2016♦		=	800	289
M0	840	8/17/2016		=	800	298
M0	840	8/18/2016		=	800	303
M0	840	8/19/2016		=	800	308
M0	840	8/20/2016		=	800	313
M0	840	8/21/2016		=	800	318
M0	840	8/22/2016		=	800	323
M0	830	8/23/2016♦		=	500	323
M0	830	8/24/2016		=	500	323
M0	830	8/25/2016		=	500	351
M0	830	8/26/2016		=	500	382
M0	830	8/27/2016		=	500	415
M0	830	8/28/2016		=	500	452
M0	830	8/29/2016		=	500	492
M0	945	8/30/2016♦		=	2,400	563
M0	945	8/31/2016		=	2,400	646
M0	-	8/1/2016	Dry	<	10	10
M0	-	8/2/2016♦	Dry	<	10	10
M0	-	8/3/2016	Dry	<	10	10
M0	-	8/4/2016	Dry	<	10	10
M0	-	8/5/2016	Dry	<	10	10
M0	-	8/6/2016	Dry	<	10	10
M0	-	8/7/2016	Dry	<	10	10
M0	-	8/8/2016	Dry	<	10	10
M0	-	8/9/2016♦	Dry	<	10	10
M0	-	8/10/2016	Dry	<	10	10
M0	-	8/11/2016	Dry	<	10	10
M0	-	8/12/2016	Dry	<	10	10
M0	-	8/13/2016	Dry	<	10	10
M0	-	8/14/2016	Dry	<	10	10
M0	-	8/15/2016	Dry	<	10	10
M0	-	8/16/2016♦	Dry	<	10	10
M0	-	8/17/2016	Dry	<	10	10
M0	-	8/18/2016	Dry	<	10	10
M0	-	8/19/2016	Dry	<	10	10
M0	-	8/20/2016	Dry	<	10	10
M0	-	8/21/2016	Dry	<	10	10
M0	-	8/22/2016	Dry	<	10	10
M0	-	8/23/2016♦	Dry	<	10	10
M0	-	8/24/2016	Dry	<	10	10



1					Single Sample (adjusted for rain, dry and NDs)	Geomean
	Time	Date	Rain		E. coli	E. coli
					(235 MPN)	(126 MPN)
	-	8/25/2016	Dry	<	10	10
	-	8/26/2016	Dry	<	10	10
	-	8/27/2016	Dry	<	10	10
	-	8/28/2016	Dry	<	10	10
	-	8/29/2016	Dry	<	10	10
	-	8/30/2016♦	Dry	<	10	10
	-	8/31/2016	Dry	<	10	10
	-	8/1/2016	Dry	<	10	10
	-	8/2/2016♦	Dry	<	10	10
	-	8/3/2016	Dry	<	10	10
	-	8/4/2016	Dry	<	10	10
	-	8/5/2016	Dry	<	10	10
	-	8/6/2016	Dry	<	10	10
	-	8/7/2016	Dry	<	10	10
	-	8/8/2016	Dry	<	10	10
	-	8/9/2016♦	Dry	<	10	10
	-	8/10/2016	Dry	<	10	10
	-	8/11/2016	Dry	<	10	10
	-	8/12/2016	Dry	<	10	10
	-	8/13/2016	Dry	<	10	10
	-	8/14/2016	Dry	<	10	10
	-	8/15/2016	Dry	<	10	10
	-	8/16/2016♦	Dry	<	10	10
	-	8/17/2016	Dry	<	10	10
	-	8/18/2016	Dry	<	10	10
	-	8/19/2016	Dry	<	10	10
	-	8/20/2016	Dry	<	10	10
	-	8/21/2016	Dry	<	10	10
	-	8/22/2016	Dry	<	10	10
	-	8/23/2016♦	Dry	<	10	10
	-	8/24/2016	Dry	<	10	10
	-	8/25/2016	Dry	<	10	10
	-	8/26/2016	Dry	<	10	10
	-	8/27/2016	Dry	<	10	10
	-	8/28/2016	Dry	<	10	10
	-	8/29/2016	Dry	<	10	10
	-	8/30/2016♦	Dry	<	10	10
	-	8/31/2016	Dry	<	10	10

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wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample to calculate the geomean.

20 are adjusted to use half the MDL (=10) in the calculation of the geomean

CB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

Water Service experienced a main pipe break discharging a large amount of water into Medea Creek resulting in flow at results show that the location was in compliance. Samples could not be collected the following week due to a return to dry

mping



July 18, 2016

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
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**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND OAKS**

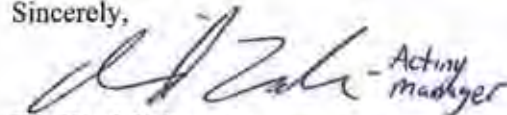
Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of June 2016. Sites were sampled weekly on Tuesdays (June 7, 14, 21 and 28). Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 645-1382.

Sincerely,



Ewelina Mutkowska

County Stormwater Program Manager, Watershed Protection District

CC: Tully Clifford, Watershed Protection District
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	-	6/7/2016 ♦			Dry
MCW-8b	-	6/14/2016 ♦			Dry
MCW-8b	-	6/21/2016 ♦			Dry
MCW-8b	-	6/28/2016 ♦			Dry
MCW-9	-	6/7/2016 ♦			Dry
MCW-9	-	6/14/2016 ♦			Dry
MCW-9	-	6/21/2016 ♦			Dry
MCW-9	-	6/28/2016 ♦			Dry
MCW-12	-	6/7/2016 ♦			Dry
MCW-12	-	6/14/2016 ♦			Dry
MCW-12	-	6/21/2016 ♦			Dry
MCW-12	-	6/28/2016 ♦			Dry
MCW-14b	845	6/7/2016 ♦		=	40
MCW-14b	925	6/14/2016 ♦		=	300
MCW-14b	830	6/21/2016 ♦		=	20
MCW-14b	715	6/28/2016 ♦		=	500
MCW-15c	800	6/7/2016 ♦		=	130
MCW-15c	840	6/14/2016 ♦		<	20
MCW-15c	750	6/21/2016 ♦		=	20
MCW-15c	755	6/28/2016 ♦		=	110
MCW-17	-	6/7/2016 ♦			Dry
MCW-17	-	6/14/2016 ♦			Dry
MCW-17	-	6/21/2016 ♦			Dry
MCW-17	-	6/28/2016 ♦			Dry
MCW-18	-	6/7/2016 ♦			Dry
MCW-18	-	6/14/2016 ♦			Dry
MCW-18	-	6/21/2016 ♦			Dry
MCW-18	-	6/28/2016 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-8b	-	6/1/2016	Dry	<	10	10
MCW-8b	-	6/2/2016	Dry	<	10	10
MCW-8b	-	6/3/2016	Dry	<	10	10
MCW-8b	-	6/4/2016	Dry	<	10	10
MCW-8b	-	6/5/2016	Dry	<	10	10
MCW-8b	-	6/6/2016	Dry	<	10	10
MCW-8b	-	6/7/2016♦	Dry	<	10	10
MCW-8b	-	6/8/2016	Dry	<	10	10
MCW-8b	-	6/9/2016	Dry	<	10	10
MCW-8b	-	6/10/2016	Dry	<	10	10
MCW-8b	-	6/11/2016	Dry	<	10	10
MCW-8b	-	6/12/2016	Dry	<	10	10
MCW-8b	-	6/13/2016	Dry	<	10	10
MCW-8b	-	6/14/2016♦	Dry	<	10	10
MCW-8b	-	6/15/2016	Dry	<	10	10
MCW-8b	-	6/16/2016	Dry	<	10	10
MCW-8b	-	6/17/2016	Dry	<	10	10
MCW-8b	-	6/18/2016	Dry	<	10	10
MCW-8b	-	6/19/2016	Dry	<	10	10
MCW-8b	-	6/20/2016	Dry	<	10	10
MCW-8b	-	6/21/2016♦	Dry	<	10	10
MCW-8b	-	6/22/2016	Dry	<	10	10
MCW-8b	-	6/23/2016	Dry	<	10	10
MCW-8b	-	6/24/2016	Dry	<	10	10
MCW-8b	-	6/25/2016	Dry	<	10	10
MCW-8b	-	6/26/2016	Dry	<	10	10
MCW-8b	-	6/27/2016	Dry	<	10	10
MCW-8b	-	6/28/2016♦	Dry	<	10	10
MCW-8b	-	6/29/2016	Dry	<	10	10
MCW-8b	-	6/30/2016	Dry	<	10	10
MCW-9	-	6/1/2016	Dry	<	10	10
MCW-9	-	6/2/2016	Dry	<	10	10
MCW-9	-	6/3/2016	Dry	<	10	10
MCW-9	-	6/4/2016	Dry	<	10	10
MCW-9	-	6/5/2016	Dry	<	10	10
MCW-9	-	6/6/2016	Dry	<	10	10
MCW-9	-	6/7/2016♦	Dry	<	10	10
MCW-9	-	6/8/2016	Dry	<	10	10
MCW-9	-	6/9/2016	Dry	<	10	10
MCW-9	-	6/10/2016	Dry	<	10	10
MCW-9	-	6/11/2016	Dry	<	10	10
MCW-9	-	6/12/2016	Dry	<	10	10
MCW-9	-	6/13/2016	Dry	<	10	10
MCW-9	-	6/14/2016♦	Dry	<	10	10



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDBs)	Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-9	-	6/15/2016	Dry	<	10	10
MCW-9	-	6/16/2016	Dry	<	10	10
MCW-9	-	6/17/2016	Dry	<	10	10
MCW-9	-	6/18/2016	Dry	<	10	10
MCW-9	-	6/19/2016	Dry	<	10	10
MCW-9	-	6/20/2016	Dry	<	10	10
MCW-9	-	6/21/2016♦	Dry	<	10	10
MCW-9	-	6/22/2016	Dry	<	10	10
MCW-9	-	6/23/2016	Dry	<	10	10
MCW-9	-	6/24/2016	Dry	<	10	10
MCW-9	-	6/25/2016	Dry	<	10	10
MCW-9	-	6/26/2016	Dry	<	10	10
MCW-9	-	6/27/2016	Dry	<	10	10
MCW-9	-	6/28/2016♦	Dry	<	10	10
MCW-9	-	6/29/2016	Dry	<	10	10
MCW-9	-	6/30/2016	Dry	<	10	10
MCW-12	-	6/1/2016	Dry	<	10	10
MCW-12	-	6/2/2016	Dry	<	10	10
MCW-12	-	6/3/2016	Dry	<	10	10
MCW-12	-	6/4/2016	Dry	<	10	10
MCW-12	-	6/5/2016	Dry	<	10	10
MCW-12	-	6/6/2016	Dry	<	10	10
MCW-12	-	6/7/2016♦	Dry	<	10	10
MCW-12	-	6/8/2016	Dry	<	10	10
MCW-12	-	6/9/2016	Dry	<	10	10
MCW-12	-	6/10/2016	Dry	<	10	10
MCW-12	-	6/11/2016	Dry	<	10	10
MCW-12	-	6/12/2016	Dry	<	10	10
MCW-12	-	6/13/2016	Dry	<	10	10
MCW-12	-	6/14/2016♦	Dry	<	10	10
MCW-12	-	6/15/2016	Dry	<	10	10
MCW-12	-	6/16/2016	Dry	<	10	10
MCW-12	-	6/17/2016	Dry	<	10	10
MCW-12	-	6/18/2016	Dry	<	10	10
MCW-12	-	6/19/2016	Dry	<	10	10
MCW-12	-	6/20/2016	Dry	<	10	10
MCW-12	-	6/21/2016♦	Dry	<	10	10
MCW-12	-	6/22/2016	Dry	<	10	10
MCW-12	-	6/23/2016	Dry	<	10	10
MCW-12	-	6/24/2016	Dry	<	10	10
MCW-12	-	6/25/2016	Dry	<	10	10
MCW-12	-	6/26/2016	Dry	<	10	10
MCW-12	-	6/27/2016	Dry	<	10	10
MCW-12	-	6/28/2016♦	Dry	<	10	10



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-12	-	6/29/2016	Dry	<	10	10
MCW-12	-	6/30/2016	Dry	<	10	10
MCW-14b	850	6/1/2016		=	80	191
MCW-14b	850	6/2/2016		=	80	179
MCW-14b	850	6/3/2016		=	80	169
MCW-14b	850	6/4/2016		=	80	159
MCW-14b	850	6/5/2016		=	80	149
MCW-14b	850	6/6/2016		=	80	140
MCW-14b	845	6/7/2016 ♦		=	40	129
MCW-14b	845	6/8/2016		=	40	119
MCW-14b	845	6/9/2016		=	40	116
MCW-14b	845	6/10/2016		=	40	113
MCW-14b	845	6/11/2016		=	40	111
MCW-14b	845	6/12/2016		=	40	108
MCW-14b	845	6/13/2016		=	40	106
MCW-14b	925	6/14/2016 ♦		=	300	110
MCW-14b	925	6/15/2016		=	300	115
MCW-14b	925	6/16/2016		=	300	121
MCW-14b	925	6/17/2016		=	300	121
MCW-14b	925	6/18/2016		=	300	121
MCW-14b	925	6/19/2016		=	300	121
MCW-14b	925	6/20/2016		=	300	121
MCW-14b	830	6/21/2016 ♦		=	20	110
MCW-14b	830	6/22/2016		=	20	101
MCW-14b	830	6/23/2016		=	20	94
MCW-14b	830	6/24/2016		=	20	87
MCW-14b	830	6/25/2016		=	20	81
MCW-14b	830	6/26/2016		=	20	76
MCW-14b	830	6/27/2016		=	20	70
MCW-14b	715	6/28/2016 ♦		=	500	73
MCW-14b	715	6/29/2016		=	500	76
MCW-14b	715	6/30/2016		=	500	81
MCW-15c	810	6/1/2016		=	80	46
MCW-15c	810	6/2/2016		=	80	46
MCW-15c	810	6/3/2016		=	80	46
MCW-15c	810	6/4/2016		=	80	46
MCW-15c	810	6/5/2016		=	80	46
MCW-15c	810	6/6/2016		=	80	47
MCW-15c	800	6/7/2016 ♦		=	130	48
MCW-15c	800	6/8/2016		=	130	49
MCW-15c	800	6/9/2016		=	130	52
MCW-15c	800	6/10/2016		=	130	55
MCW-15c	800	6/11/2016		=	130	59
MCW-15c	800	6/12/2016		=	130	62
MCW-15c	800	6/13/2016		=	130	66



				Single Sample (adjusted for rain, dry and NDs)		Geomean
Location	Time	Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	840	6/14/2016 ♦		<	10	65
MCW-15c	840	6/15/2016		<	10	63
MCW-15c	840	6/16/2016		<	10	62
MCW-15c	840	6/17/2016		<	10	58
MCW-15c	840	6/18/2016		<	10	54
MCW-15c	840	6/19/2016		<	10	50
MCW-15c	840	6/20/2016		<	10	47
MCW-15c	750	6/21/2016 ♦		=	20	45
MCW-15c	750	6/22/2016		=	20	43
MCW-15c	750	6/23/2016		=	20	42
MCW-15c	750	6/24/2016		=	20	41
MCW-15c	750	6/25/2016		=	20	40
MCW-15c	750	6/26/2016		=	20	39
MCW-15c	750	6/27/2016		=	20	38
MCW-15c	755	6/28/2016 ♦		=	110	39
MCW-15c	755	6/29/2016		=	110	41
MCW-15c	755	6/30/2016		=	110	41
MCW-17	-	6/1/2016	Dry	<	10	10
MCW-17	-	6/2/2016	Dry	<	10	10
MCW-17	-	6/3/2016	Dry	<	10	10
MCW-17	-	6/4/2016	Dry	<	10	10
MCW-17	-	6/5/2016	Dry	<	10	10
MCW-17	-	6/6/2016	Dry	<	10	10
MCW-17	-	6/7/2016 ♦	Dry	<	10	10
MCW-17	-	6/8/2016	Dry	<	10	10
MCW-17	-	6/9/2016	Dry	<	10	10
MCW-17	-	6/10/2016	Dry	<	10	10
MCW-17	-	6/11/2016	Dry	<	10	10
MCW-17	-	6/12/2016	Dry	<	10	10
MCW-17	-	6/13/2016	Dry	<	10	10
MCW-17	-	6/14/2016 ♦	Dry	<	10	10
MCW-17	-	6/15/2016	Dry	<	10	10
MCW-17	-	6/16/2016	Dry	<	10	10
MCW-17	-	6/17/2016	Dry	<	10	10
MCW-17	-	6/18/2016	Dry	<	10	10
MCW-17	-	6/19/2016	Dry	<	10	10
MCW-17	-	6/20/2016	Dry	<	10	10
MCW-17	-	6/21/2016 ♦	Dry	<	10	10
MCW-17	-	6/22/2016	Dry	<	10	10
MCW-17	-	6/23/2016	Dry	<	10	10
MCW-17	-	6/24/2016	Dry	<	10	10
MCW-17	-	6/25/2016	Dry	<	10	10
MCW-17	-	6/26/2016	Dry	<	10	10
MCW-17	-	6/27/2016	Dry	<	10	10
MCW-17	-	6/28/2016 ♦	Dry	<	10	10
MCW-17	-	6/29/2016	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-17	-	6/30/2016	Dry	<	10	10
MCW-18	-	6/1/2016	Dry	<	10	10
MCW-18	-	6/2/2016	Dry	<	10	10
MCW-18	-	6/3/2016	Dry	<	10	10
MCW-18	-	6/4/2016	Dry	<	10	10
MCW-18	-	6/5/2016	Dry	<	10	10
MCW-18	-	6/6/2016	Dry	<	10	10
MCW-18	-	6/7/2016 ♦	Dry	<	10	10
MCW-18	-	6/8/2016	Dry	<	10	10
MCW-18	-	6/9/2016	Dry	<	10	10
MCW-18	-	6/10/2016	Dry	<	10	10
MCW-18	-	6/11/2016	Dry	<	10	10
MCW-18	-	6/12/2016	Dry	<	10	10
MCW-18	-	6/13/2016	Dry	<	10	10
MCW-18	-	6/14/2016 ♦	Dry	<	10	10
MCW-18	-	6/15/2016	Dry	<	10	10
MCW-18	-	6/16/2016	Dry	<	10	10
MCW-18	-	6/17/2016	Dry	<	10	10
MCW-18	-	6/18/2016	Dry	<	10	10
MCW-18	-	6/19/2016	Dry	<	10	10
MCW-18	-	6/20/2016	Dry	<	10	10
MCW-18	-	6/21/2016 ♦	Dry	<	10	10
MCW-18	-	6/22/2016	Dry	<	10	10
MCW-18	-	6/23/2016	Dry	<	10	10
MCW-18	-	6/24/2016	Dry	<	10	10
MCW-18	-	6/25/2016	Dry	<	10	10
MCW-18	-	6/26/2016	Dry	<	10	10
MCW-18	-	6/27/2016	Dry	<	10	10
MCW-18	-	6/28/2016 ♦	Dry	<	10	10
MCW-18	-	6/29/2016	Dry	<	10	10
MCW-18	-	6/30/2016	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



October 19, 2016

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Cosio, Director

Engineering Services Department
Christopher E. Cooper, Director

Transportation Department
David L. Fleisch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Peter Sheydayi, Interim Director

Subject: **MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of September 2016. Sites were sampled weekly on Tuesdays (September 6, 13, 20 and 27). Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm
Deputy Director, Watershed Protection District

CC: Peter Sheydayi, Interim Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	-	9/6/2016 ♦			Dry
MCW-8b	-	9/13/2016 ♦			Dry
MCW-8b	-	9/20/2016 ♦			Dry
MCW-8b	-	9/27/2016 ♦			Dry
MCW-9	-	9/6/2016 ♦			Dry
MCW-9	-	9/13/2016 ♦			Dry
MCW-9	-	9/20/2016 ♦			Dry
MCW-9	-	9/27/2016 ♦			Dry
MCW-12	-	9/6/2016 ♦			Dry
MCW-12	-	9/13/2016 ♦			Dry
MCW-12	-	9/20/2016 ♦			Dry
MCW-12	-	9/27/2016 ♦			Dry
MCW-14b	915	9/6/2016 ♦		=	80
MCW-14b	1015	9/13/2016 ♦		=	20
MCW-14b	1130	9/20/2016 ♦		=	80
MCW-14b	1020	9/27/2016 ♦		=	36
MCW-15c	830	9/6/2016 ♦		=	3,000
MCW-15c	940	9/13/2016 ♦		=	20
MCW-15c	1045	9/20/2016 ♦		=	40
MCW-15c	945	9/27/2016 ♦		=	490
MCW-17	-	9/6/2016 ♦			Dry
MCW-17	-	9/13/2016 ♦			Dry
MCW-17	-	9/20/2016 ♦			Dry
MCW-17	-	9/27/2016 ♦			Dry
MCW-18	-	9/6/2016 ♦			Dry
MCW-18	-	9/13/2016 ♦			Dry
MCW-18	-	9/20/2016 ♦			Dry
MCW-18	-	9/27/2016 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-8b	-	9/1/16	Dry	<	10	10
MCW-8b	-	9/2/16	Dry	<	10	10
MCW-8b	-	9/3/16	Dry	<	10	10
MCW-8b	-	9/4/16	Dry	<	10	10
MCW-8b	-	9/5/16	Dry	<	10	10
MCW-8b	-	9/6/2016♦	Dry	<	10	10
MCW-8b	-	9/7/16	Dry	<	10	10
MCW-8b	-	9/8/16	Dry	<	10	10
MCW-8b	-	9/9/16	Dry	<	10	10
MCW-8b	-	9/10/16	Dry	<	10	10
MCW-8b	-	9/11/16	Dry	<	10	10
MCW-8b	-	9/12/16	Dry	<	10	10
MCW-8b	-	9/13/2016♦	Dry	<	10	10
MCW-8b	-	9/14/16	Dry	<	10	10
MCW-8b	-	9/15/16	Dry	<	10	10
MCW-8b	-	9/16/16	Dry	<	10	10
MCW-8b	-	9/17/16	Dry	<	10	10
MCW-8b	-	9/18/16	Dry	<	10	10
MCW-8b	-	9/19/16	Dry	<	10	10
MCW-8b	-	9/20/2016♦	Dry	<	10	10
MCW-8b	-	9/21/16	Dry	<	10	10
MCW-8b	-	9/22/16	Dry	<	10	10
MCW-8b	-	9/23/16	Dry	<	10	10
MCW-8b	-	9/24/16	Dry	<	10	10
MCW-8b	-	9/25/16	Dry	<	10	10
MCW-8b	-	9/26/16	Dry	<	10	10
MCW-8b	-	9/27/2016♦	Dry	<	10	10
MCW-8b	-	9/28/16	Dry	<	10	10
MCW-8b	-	9/29/16	Dry	<	10	10
MCW-8b	-	9/30/16	Dry	<	10	10
MCW-9	-	9/1/16	Dry	<	10	10
MCW-9	-	9/2/16	Dry	<	10	10
MCW-9	-	9/3/16	Dry	<	10	10
MCW-9	-	9/4/16	Dry	<	10	10
MCW-9	-	9/5/16	Dry	<	10	10
MCW-9	-	9/6/2016♦	Dry	<	10	10
MCW-9	-	9/7/16	Dry	<	10	10
MCW-9	-	9/8/16	Dry	<	10	10
MCW-9	-	9/9/16	Dry	<	10	10
MCW-9	-	9/10/16	Dry	<	10	10
MCW-9	-	9/11/16	Dry	<	10	10
MCW-9	-	9/12/16	Dry	<	10	10
MCW-9	-	9/13/2016♦	Dry	<	10	10
MCW-9	-	9/14/16	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				<	E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-9	-	9/15/16	Dry	<	10	10
MCW-9	-	9/16/16	Dry	<	10	10
MCW-9	-	9/17/16	Dry	<	10	10
MCW-9	-	9/18/16	Dry	<	10	10
MCW-9	-	9/19/16	Dry	<	10	10
MCW-9	-	9/20/2016♦	Dry	<	10	10
MCW-9	-	9/21/16	Dry	<	10	10
MCW-9	-	9/22/16	Dry	<	10	10
MCW-9	-	9/23/16	Dry	<	10	10
MCW-9	-	9/24/16	Dry	<	10	10
MCW-9	-	9/25/16	Dry	<	10	10
MCW-9	-	9/26/16	Dry	<	10	10
MCW-9	-	9/27/2016♦	Dry	<	10	10
MCW-9	-	9/28/16	Dry	<	10	10
MCW-9	-	9/29/16	Dry	<	10	10
MCW-9	-	9/30/16	Dry	<	10	10
MCW-12	-	9/1/16	Dry	<	10	21
MCW-12	-	9/2/16	Dry	<	10	21
MCW-12	-	9/3/16	Dry	<	10	21
MCW-12	-	9/4/16	Dry	<	10	21
MCW-12	-	9/5/16	Dry	<	10	21
MCW-12	-	9/6/2016♦	Dry	<	10	21
MCW-12	-	9/7/16	Dry	<	10	21
MCW-12	-	9/8/16	Dry	<	10	21
MCW-12	-	9/9/16	Dry	<	10	21
MCW-12	-	9/10/16	Dry	<	10	21
MCW-12	-	9/11/16	Dry	<	10	21
MCW-12	-	9/12/16	Dry	<	10	21
MCW-12	-	9/13/2016♦	Dry	<	10	21
MCW-12	-	9/14/16	Dry	<	10	21
MCW-12	-	9/15/16	Dry	<	10	21
MCW-12	-	9/16/16	Dry	<	10	21
MCW-12	-	9/17/16	Dry	<	10	21
MCW-12	-	9/18/16	Dry	<	10	21
MCW-12	-	9/19/16	Dry	<	10	21
MCW-12	-	9/20/2016♦	Dry	<	10	21
MCW-12	-	9/21/16	Dry	<	10	21
MCW-12	-	9/22/16	Dry	<	10	19
MCW-12	-	9/23/16	Dry	<	10	18
MCW-12	-	9/24/16	Dry	<	10	16
MCW-12	-	9/25/16	Dry	<	10	15
MCW-12	-	9/26/16	Dry	<	10	13
MCW-12	-	9/27/2016♦	Dry	<	10	12
MCW-12	-	9/28/16	Dry	<	10	11



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-12	-	9/29/16	Dry	<	10	10
MCW-12	-	9/30/16	Dry	<	10	10
MCW-14b	1020	9/1/16		=	130	238
MCW-14b	1020	9/2/16		=	130	247
MCW-14b	1020	9/3/16		=	130	257
MCW-14b	1020	9/4/16		=	130	267
MCW-14b	1020	9/5/16		=	130	278
MCW-14b	915	9/6/2016♦		=	80	285
MCW-14b	915	9/7/16		=	80	291
MCW-14b	915	9/8/16		=	80	274
MCW-14b	915	9/9/16		=	80	258
MCW-14b	915	9/10/16		=	80	242
MCW-14b	915	9/11/16		=	80	228
MCW-14b	915	9/12/16		=	80	215
MCW-14b	1015	9/13/2016♦		=	20	193
MCW-14b	1015	9/14/16		=	20	173
MCW-14b	1015	9/15/16		=	20	177
MCW-14b	1015	9/16/16		=	20	181
MCW-14b	1015	9/17/16		=	20	186
MCW-14b	1015	9/18/16		=	20	190
MCW-14b	1015	9/19/16		=	20	194
MCW-14b	1130	9/20/2016♦		=	80	208
MCW-14b	1130	9/21/16		=	80	223
MCW-14b	1130	9/22/16		=	80	187
MCW-14b	1130	9/23/16		=	80	157
MCW-14b	1130	9/24/16		=	80	131
MCW-14b	1130	9/25/16		=	80	110
MCW-14b	1130	9/26/16		=	80	92
MCW-14b	1020	9/27/2016♦		=	36	75
MCW-14b	1020	9/28/16		=	36	61
MCW-14b	1020	9/29/16		=	36	59
MCW-14b	1020	9/30/16		=	36	56
MCW-15c	945	9/1/16		=	2,400	698
MCW-15c	945	9/2/16		=	2,400	755
MCW-15c	945	9/3/16		=	2,400	817
MCW-15c	945	9/4/16		=	2,400	883
MCW-15c	945	9/5/16		=	2,400	955
MCW-15c	830	9/6/2016♦		=	3,000	1,040
MCW-15c	830	9/7/16		=	3,000	1,133
MCW-15c	830	9/8/16		=	3,000	1,165
MCW-15c	830	9/9/16		=	3,000	1,198
MCW-15c	830	9/10/16		=	3,000	1,232
MCW-15c	830	9/11/16		=	3,000	1,267
MCW-15c	830	9/12/16		=	3,000	1,303
MCW-15c	940	9/13/2016♦		=	20	1,133



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	940	9/14/16		=	20	986
MCW-15c	940	9/15/16		=	20	872
MCW-15c	940	9/16/16		=	20	771
MCW-15c	940	9/17/16		=	20	682
MCW-15c	940	9/18/16		=	20	603
MCW-15c	940	9/19/16		=	20	533
MCW-15c	1045	9/20/2016◆		=	40	483
MCW-15c	1045	9/21/16		=	40	437
MCW-15c	1045	9/22/16		=	40	401
MCW-15c	1045	9/23/16		=	40	369
MCW-15c	1045	9/24/16		=	40	339
MCW-15c	1045	9/25/16		=	40	312
MCW-15c	1045	9/26/16		=	40	287
MCW-15c	945	9/27/2016◆		=	490	286
MCW-15c	945	9/28/16		=	490	286
MCW-15c	945	9/29/16		=	490	272
MCW-15c	945	9/30/16		=	490	258
MCW-17	-	9/1/16	Dry	<	10	10
MCW-17	-	9/2/16	Dry	<	10	10
MCW-17	-	9/3/16	Dry	<	10	10
MCW-17	-	9/4/16	Dry	<	10	10
MCW-17	-	9/5/16	Dry	<	10	10
MCW-17	-	9/6/2016◆	Dry	<	10	10
MCW-17	-	9/7/16	Dry	<	10	10
MCW-17	-	9/8/16	Dry	<	10	10
MCW-17	-	9/9/16	Dry	<	10	10
MCW-17	-	9/10/16	Dry	<	10	10
MCW-17	-	9/11/16	Dry	<	10	10
MCW-17	-	9/12/16	Dry	<	10	10
MCW-17	-	9/13/2016◆	Dry	<	10	10
MCW-17	-	9/14/16	Dry	<	10	10
MCW-17	-	9/15/16	Dry	<	10	10
MCW-17	-	9/16/16	Dry	<	10	10
MCW-17	-	9/17/16	Dry	<	10	10
MCW-17	-	9/18/16	Dry	<	10	10
MCW-17	-	9/19/16	Dry	<	10	10
MCW-17	-	9/20/2016◆	Dry	<	10	10
MCW-17	-	9/21/16	Dry	<	10	10
MCW-17	-	9/22/16	Dry	<	10	10
MCW-17	-	9/23/16	Dry	<	10	10
MCW-17	-	9/24/16	Dry	<	10	10
MCW-17	-	9/25/16	Dry	<	10	10
MCW-17	-	9/26/16	Dry	<	10	10
MCW-17	-	9/27/2016◆	Dry	<	10	10
MCW-17	-	9/28/16	Dry	<	10	10
MCW-17	-	9/29/16	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-17	-	9/30/16	Dry	<	10	10
MCW-18	-	9/1/16	Dry	<	10	10
MCW-18	-	9/2/16	Dry	<	10	10
MCW-18	-	9/3/16	Dry	<	10	10
MCW-18	-	9/4/16	Dry	<	10	10
MCW-18	-	9/5/16	Dry	<	10	10
MCW-18	-	9/6/2016♦	Dry	<	10	10
MCW-18	-	9/7/16	Dry	<	10	10
MCW-18	-	9/8/16	Dry	<	10	10
MCW-18	-	9/9/16	Dry	<	10	10
MCW-18	-	9/10/16	Dry	<	10	10
MCW-18	-	9/11/16	Dry	<	10	10
MCW-18	-	9/12/16	Dry	<	10	10
MCW-18	-	9/13/2016♦	Dry	<	10	10
MCW-18	-	9/14/16	Dry	<	10	10
MCW-18	-	9/15/16	Dry	<	10	10
MCW-18	-	9/16/16	Dry	<	10	10
MCW-18	-	9/17/16	Dry	<	10	10
MCW-18	-	9/18/16	Dry	<	10	10
MCW-18	-	9/19/16	Dry	<	10	10
MCW-18	-	9/20/2016♦	Dry	<	10	10
MCW-18	-	9/21/16	Dry	<	10	10
MCW-18	-	9/22/16	Dry	<	10	10
MCW-18	-	9/23/16	Dry	<	10	10
MCW-18	-	9/24/16	Dry	<	10	10
MCW-18	-	9/25/16	Dry	<	10	10
MCW-18	-	9/26/16	Dry	<	10	10
MCW-18	-	9/27/2016♦	Dry	<	10	10
MCW-18	-	9/28/16	Dry	<	10	10
MCW-18	-	9/29/16	Dry	<	10	10
MCW-18	-	9/30/16	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



November 21, 2016

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Cosio, Director

Engineering Services Department
Christopher E. Cooper, Director

Transportation Department
David L. Felsch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Peter Sheydayl, Interim Director

**SUBJECT: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND
OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of October 2016. Sites were sampled weekly on Tuesdays (October 4, 18 and 25), except for one instance when sites were sampled on Wednesday (October 12) due to staffing conflicts. Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm
Deputy Director, Watershed Protection District

CC: Peter Sheydayl, Interim Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	-	10/4/2016 ♦			Dry
MCW-8b	-	10/12/2016 ♦			Dry
MCW-8b	-	10/18/2016 ♦			Dry
MCW-8b	-	10/25/2016 ♦			Dry
MCW-9	-	10/4/2016 ♦			Dry
MCW-9	-	10/12/2016 ♦			Dry
MCW-9	-	10/18/2016 ♦			Dry
MCW-9	-	10/25/2016 ♦			Dry
MCW-12	-	10/4/2016 ♦			Dry
MCW-12	-	10/12/2016 ♦			Dry
MCW-12	-	10/18/2016 ♦			Dry
MCW-12	-	10/25/2016 ♦			Dry
MCW-14b	1035	10/4/2016 ♦		=	1700
MCW-14b	1040	10/12/2016 ♦		=	230
MCW-14b	1040	10/18/2016 ♦		=	3000
MCW-14b	950	10/25/2016 ♦		=	260
MCW-15c	950	10/4/2016 ♦		=	110
MCW-15c	1000	10/12/2016 ♦		=	230
MCW-15c	945	10/18/2016 ♦		=	3000
MCW-15c	900	10/25/2016 ♦		=	1300
MCW-17	-	10/4/2016 ♦			Dry
MCW-17	-	10/12/2016 ♦			Dry
MCW-17	-	10/18/2016 ♦			Dry
MCW-17	-	10/25/2016 ♦			Dry
MCW-18	-	10/4/2016 ♦			Dry
MCW-18	-	10/12/2016 ♦			Dry
MCW-18	-	10/18/2016 ♦			Dry
MCW-18	-	10/25/2016 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-8b	-	10/1/16	Dry	<	10	10
MCW-8b	-	10/2/16	Dry	<	10	10
MCW-8b	-	10/3/16	Dry	<	10	10
MCW-8b	-	10/4/2016♦	Dry	<	10	10
MCW-8b	-	10/5/16	Dry	<	10	10
MCW-8b	-	10/6/16	Dry	<	10	10
MCW-8b	-	10/7/16	Dry	<	10	10
MCW-8b	-	10/8/16	Dry	<	10	10
MCW-8b	-	10/9/16	Dry	<	10	10
MCW-8b	-	10/10/16	Dry	<	10	10
MCW-8b	-	10/11/16	Dry	<	10	10
MCW-8b	-	10/12/2016♦	Dry	<	10	10
MCW-8b	-	10/13/16	Dry	<	10	10
MCW-8b	-	10/14/16	Dry	<	10	10
MCW-8b	-	10/15/16	Dry	<	10	10
MCW-8b	-	10/16/16	Dry	<	10	10
MCW-8b	-	10/17/16	Dry	<	10	10
MCW-8b	-	10/18/2016♦	Dry	<	10	10
MCW-8b	-	10/19/16	Dry	<	10	10
MCW-8b	-	10/20/16	Dry	<	10	10
MCW-8b	-	10/21/16	Dry	<	10	10
MCW-8b	-	10/22/16	Dry	<	10	10
MCW-8b	-	10/23/16	Dry	<	10	10
MCW-8b	-	10/24/16	Dry	<	10	10
MCW-8b	-	10/25/2016♦	Dry	<	10	10
MCW-8b	-	10/26/16	Dry	<	10	10
MCW-8b	-	10/27/16	Dry	<	10	10
MCW-8b	-	10/28/16	Dry	<	10	10
MCW-8b	-	10/29/16	Dry	<	10	10
MCW-8b	-	10/30/16	Dry	<	10	10
MCW-8b	-	10/31/16	Dry	<	10	10
MCW-9	-	10/1/16	Dry	<	10	10
MCW-9	-	10/2/16	Dry	<	10	10
MCW-9	-	10/3/16	Dry	<	10	10
MCW-9	-	10/4/2016♦	Dry	<	10	10
MCW-9	-	10/5/16	Dry	<	10	10
MCW-9	-	10/6/16	Dry	<	10	10
MCW-9	-	10/7/16	Dry	<	10	10
MCW-9	-	10/8/16	Dry	<	10	10
MCW-9	-	10/9/16	Dry	<	10	10
MCW-9	-	10/10/16	Dry	<	10	10
MCW-9	-	10/11/16	Dry	<	10	10
MCW-9	-	10/12/2016♦	Dry	<	10	10
MCW-9	-	10/13/16	Dry	<	10	10



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-9	-	10/14/16	Dry	<	10	10
MCW-9	-	10/15/16	Dry	<	10	10
MCW-9	-	10/16/16	Dry	<	10	10
MCW-9	-	10/17/16	Dry	<	10	10
MCW-9	-	10/18/2016♦	Dry	<	10	10
MCW-9	-	10/19/16	Dry	<	10	10
MCW-9	-	10/20/16	Dry	<	10	10
MCW-9	-	10/21/16	Dry	<	10	10
MCW-9	-	10/22/16	Dry	<	10	10
MCW-9	-	10/23/16	Dry	<	10	10
MCW-9	-	10/24/16	Dry	<	10	10
MCW-9	-	10/25/2016♦	Dry	<	10	10
MCW-9	-	10/26/16	Dry	<	10	10
MCW-9	-	10/27/16	Dry	<	10	10
MCW-9	-	10/28/16	Dry	<	10	10
MCW-9	-	10/29/16	Dry	<	10	10
MCW-9	-	10/30/16	Dry	<	10	21
MCW-9	-	10/31/16	Dry	<	10	21
MCW-12	-	10/1/16	Dry	<	10	21
MCW-12	-	10/2/16	Dry	<	10	21
MCW-12	-	10/3/16	Dry	<	10	21
MCW-12	-	10/4/2016♦	Dry	<	10	21
MCW-12	-	10/5/16	Dry	<	10	21
MCW-12	-	10/6/16	Dry	<	10	21
MCW-12	-	10/7/16	Dry	<	10	21
MCW-12	-	10/8/16	Dry	<	10	21
MCW-12	-	10/9/16	Dry	<	10	21
MCW-12	-	10/10/16	Dry	<	10	21
MCW-12	-	10/11/16	Dry	<	10	21
MCW-12	-	10/12/2016♦	Dry	<	10	21
MCW-12	-	10/13/16	Dry	<	10	21
MCW-12	-	10/14/16	Dry	<	10	21
MCW-12	-	10/15/16	Dry	<	10	21
MCW-12	-	10/16/16	Dry	<	10	21
MCW-12	-	10/17/16	Dry	<	10	21
MCW-12	-	10/18/2016♦	Dry	<	10	21
MCW-12	-	10/19/16	Dry	<	10	21
MCW-12	-	10/20/16	Dry	<	10	19
MCW-12	-	10/21/16	Dry	<	10	18
MCW-12	-	10/22/16	Dry	<	10	16
MCW-12	-	10/23/16	Dry	<	10	15
MCW-12	-	10/24/16	Dry	<	10	13
MCW-12	-	10/25/2016♦	Dry	<	10	12
MCW-12	-	10/26/16	Dry	<	10	11



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-12	-	10/27/16	Dry	<	10	10
MCW-12	-	10/28/16	Dry	<	10	10
MCW-12	-	10/29/16	Dry	<	10	10
MCW-12	-	10/30/16	Dry	<	10	10
MCW-12	-	10/31/16	Dry	<	10	10
MCW-14b	1020	10/1/16		=	36	54
MCW-14b	1020	10/2/16		=	36	52
MCW-14b	1020	10/3/16		=	36	50
MCW-14b	1035	10/4/2016♦		=	1,700	54
MCW-14b	1035	10/5/16		=	1,700	59
MCW-14b	1035	10/6/16		=	1,700	65
MCW-14b	1035	10/7/16		=	1,700	72
MCW-14b	1035	10/8/16		=	1,700	80
MCW-14b	1035	10/9/16		=	1,700	89
MCW-14b	1035	10/10/16		=	1,700	98
MCW-14b	1035	10/11/16		=	1,700	109
MCW-14b	1040	10/12/2016♦		=	230	112
MCW-14b	1040	10/13/16		=	230	122
MCW-14b	1040	10/14/16		=	230	132
MCW-14b	1040	10/15/16		=	230	144
MCW-14b	1040	10/16/16		=	230	156
MCW-14b	1040	10/17/16		=	230	169
MCW-14b	1040	10/18/2016♦		=	3,000	200
MCW-14b	1040	10/19/16		=	3,000	236
MCW-14b	1040	10/20/16		=	3,000	266
MCW-14b	1040	10/21/16		=	3,000	300
MCW-14b	1040	10/22/16		=	3,000	339
MCW-14b	1040	10/23/16		=	3,000	383
MCW-14b	1040	10/24/16		=	3,000	432
MCW-14b	950	10/25/2016♦		=	260	449
MCW-14b	950	10/26/16		=	260	467
MCW-14b	950	10/27/16		=	260	499
MCW-14b	950	10/28/16		=	260	533
MCW-14b	950	10/29/16		=	260	569
MCW-14b	950	10/30/16		=	260	608
MCW-14b	950	10/31/16		=	260	649
MCW-15c	945	10/1/16		=	490	244
MCW-15c	945	10/2/16		=	490	232
MCW-15c	945	10/3/16		=	490	220
MCW-15c	950	10/4/2016♦		=	110	198
MCW-15c	950	10/5/16		=	110	179
MCW-15c	950	10/6/16		=	110	160
MCW-15c	950	10/7/16		=	110	143
MCW-15c	950	10/8/16		=	110	129
MCW-15c	950	10/9/16		=	110	115



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	950	10/10/16		=	110	103
MCW-15c	950	10/11/16		=	110	92
MCW-15c	1000	10/12/2016 ♦		=	230	85
MCW-15c	1000	10/13/16		=	230	92
MCW-15c	1000	10/14/16		=	230	100
MCW-15c	1000	10/15/16		=	230	108
MCW-15c	1000	10/16/16		=	230	117
MCW-15c	1000	10/17/16		=	230	127
MCW-15c	945	10/18/2016 ♦		=	3,000	150
MCW-15c	945	10/19/16		=	3,000	178
MCW-15c	945	10/20/16		=	3,000	205
MCW-15c	945	10/21/16		=	3,000	237
MCW-15c	945	10/22/16		=	3,000	274
MCW-15c	945	10/23/16		=	3,000	316
MCW-15c	945	10/24/16		=	3,000	365
MCW-15c	900	10/25/2016 ♦		=	1,300	410
MCW-15c	900	10/26/16		=	1,300	461
MCW-15c	900	10/27/16		=	1,300	476
MCW-15c	900	10/28/16		=	1,300	492
MCW-15c	900	10/29/16		=	1,300	508
MCW-15c	900	10/30/16		=	1,300	525
MCW-15c	900	10/31/16		=	1,300	542
MCW-17	-	10/1/16	Dry	<	10	10
MCW-17	-	10/2/16	Dry	<	10	10
MCW-17	-	10/3/16	Dry	<	10	10
MCW-17	-	10/4/2016 ♦	Dry	<	10	10
MCW-17	-	10/5/16	Dry	<	10	10
MCW-17	-	10/6/16	Dry	<	10	10
MCW-17	-	10/7/16	Dry	<	10	10
MCW-17	-	10/8/16	Dry	<	10	10
MCW-17	-	10/9/16	Dry	<	10	10
MCW-17	-	10/10/16	Dry	<	10	10
MCW-17	-	10/11/16	Dry	<	10	10
MCW-17	-	10/12/2016 ♦	Dry	<	10	10
MCW-17	-	10/13/16	Dry	<	10	10
MCW-17	-	10/14/16	Dry	<	10	10
MCW-17	-	10/15/16	Dry	<	10	10
MCW-17	-	10/16/16	Dry	<	10	10
MCW-17	-	10/17/16	Dry	<	10	10
MCW-17	-	10/18/2016 ♦	Dry	<	10	10
MCW-17	-	10/19/16	Dry	<	10	10
MCW-17	-	10/20/16	Dry	<	10	10
MCW-17	-	10/21/16	Dry	<	10	10
MCW-17	-	10/22/16	Dry	<	10	10
MCW-17	-	10/23/16	Dry	<	10	10
MCW-17	-	10/24/16	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-17	-	10/25/2016♦	Dry	<	10	10
MCW-17	-	10/26/16	Dry	<	10	10
MCW-17	-	10/27/16	Dry	<	10	10
MCW-17	-	10/28/16	Dry	<	10	10
MCW-17	-	10/29/16	Dry	<	10	10
MCW-17	-	10/30/16	Dry	<	10	10
MCW-17	-	10/31/16	Dry	<	10	10
MCW-18	-	10/1/16	Dry	<	10	10
MCW-18	-	10/2/16	Dry	<	10	10
MCW-18	-	10/3/16	Dry	<	10	10
MCW-18	-	10/4/2016♦	Dry	<	10	10
MCW-18	-	10/5/16	Dry	<	10	10
MCW-18	-	10/6/16	Dry	<	10	10
MCW-18	-	10/7/16	Dry	<	10	10
MCW-18	-	10/8/16	Dry	<	10	10
MCW-18	-	10/9/16	Dry	<	10	10
MCW-18	-	10/10/16	Dry	<	10	10
MCW-18	-	10/11/16	Dry	<	10	10
MCW-18	-	10/12/2016♦	Dry	<	10	10
MCW-18	-	10/13/16	Dry	<	10	10
MCW-18	-	10/14/16	Dry	<	10	10
MCW-18	-	10/15/16	Dry	<	10	10
MCW-18	-	10/16/16	Dry	<	10	10
MCW-18	-	10/17/16	Dry	<	10	10
MCW-18	-	10/18/2016♦	Dry	<	10	10
MCW-18	-	10/19/16	Dry	<	10	10
MCW-18	-	10/20/16	Dry	<	10	10
MCW-18	-	10/21/16	Dry	<	10	10
MCW-18	-	10/22/16	Dry	<	10	10
MCW-18	-	10/23/16	Dry	<	10	10
MCW-18	-	10/24/16	Dry	<	10	10
MCW-18	-	10/25/2016♦	Dry	<	10	10
MCW-18	-	10/26/16	Dry	<	10	10
MCW-18	-	10/27/16	Dry	<	10	10
MCW-18	-	10/28/16	Dry	<	10	10
MCW-18	-	10/29/16	Dry	<	10	10
MCW-18	-	10/30/16	Dry	<	10	10
MCW-18	-	10/31/16	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



December 19, 2016

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Cosio, Director

Engineering Services Department
Christopher E. Cooper, Director

Transportation Department
David L. Fleisch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Peter Sheydayi, Interim Director

**SUBJECT: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND
OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of November 2016. Sites were sampled weekly on Tuesdays (November 1, 8, 15, 22 and 29). Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm
Deputy Director, Watershed Protection District

CC: Glenn Shephard, Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	-	11/1/2016 ♦			Dry
MCW-8b	-	11/8/2016 ♦			Dry
MCW-8b	-	11/15/2016 ♦			Dry
MCW-8b	-	11/22/2016 ♦			Dry
MCW-8b	-	11/29/2016 ♦			Dry
MCW-9	-	11/1/2016 ♦			Dry
MCW-9	-	11/8/2016 ♦			Dry
MCW-9	-	11/15/2016 ♦			Dry
MCW-9	-	11/22/2016 ♦			Dry
MCW-9	-	11/29/2016 ♦			Dry
MCW-12	-	11/1/2016 ♦			Dry
MCW-12	-	11/8/2016 ♦			Dry
MCW-12	-	11/15/2016 ♦			Dry
MCW-12	-	11/22/2016 ♦			Dry
MCW-12	-	11/29/2016 ♦			Dry
MCW-14b	1000	11/1/2016 ♦	Rain	=	1,700
MCW-14b	1000	11/8/2016 ♦		=	16,000
MCW-14b	1015	11/15/2016 ♦		=	130
MCW-14b	920	11/22/2016 ♦	Rain	=	5,000
MCW-14b	950	11/29/2016 ♦	Rain	=	20
MCW-15c	1055	11/1/2016 ♦	Rain	=	1,300
MCW-15c	920	11/8/2016 ♦		=	16,000
MCW-15c	940	11/15/2016 ♦		=	170
MCW-15c	840	11/22/2016 ♦	Rain	=	300
MCW-15c	910	11/29/2016 ♦	Rain	=	80
MCW-17	-	11/1/2016 ♦			Dry
MCW-17	-	11/8/2016 ♦			Dry
MCW-17	-	11/15/2016 ♦			Dry
MCW-17	-	11/22/2016 ♦			Dry
MCW-17	-	11/29/2016 ♦			Dry
MCW-18	-	11/1/2016 ♦			Dry
MCW-18	-	11/8/2016 ♦			Dry
MCW-18	-	11/15/2016 ♦			Dry
MCW-18	-	11/22/2016 ♦			Dry
MCW-18	-	11/29/2016 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-8b	-	11/1/2016 ♦	Dry	<	10	10
MCW-8b	-	11/2/2016	Dry	<	10	10
MCW-8b	-	11/3/2016	Dry	<	10	10
MCW-8b	-	11/4/2016	Dry	<	10	10
MCW-8b	-	11/5/2016	Dry	<	10	10
MCW-8b	-	11/6/2016	Dry	<	10	10
MCW-8b	-	11/7/2016	Dry	<	10	10
MCW-8b	+	11/8/2016 ♦	Dry	<	10	10
MCW-8b	-	11/9/2016	Dry	<	10	10
MCW-8b	-	11/10/2016	Dry	<	10	10
MCW-8b	-	11/11/2016	Dry	<	10	10
MCW-8b	-	11/12/2016	Dry	<	10	10
MCW-8b	-	11/13/2016	Dry	<	10	10
MCW-8b	-	11/14/2016	Dry	<	10	10
MCW-8b	-	11/15/2016 ♦	Dry	<	10	10
MCW-8b	-	11/16/2016	Dry	<	10	10
MCW-8b	-	11/17/2016	Dry	<	10	10
MCW-8b	+	11/18/2016	Dry	<	10	10
MCW-8b	+	11/19/2016	Dry	<	10	10
MCW-8b	-	11/20/2016	Dry	<	10	10
MCW-8b	-	11/21/2016	Dry	<	10	10
MCW-8b	-	11/22/2016 ♦	Dry	<	10	10
MCW-8b	-	11/23/2016	Dry	<	10	10
MCW-8b	-	11/24/2016	Dry	<	10	10
MCW-8b	-	11/25/2016	Dry	<	10	10
MCW-8b	-	11/26/2016	Dry	<	10	10
MCW-8b	+	11/27/2016	Dry	<	10	10
MCW-8b	-	11/28/2016	Dry	<	10	10
MCW-8b	-	11/29/2016 ♦	Dry	<	10	10
MCW-8b	-	11/30/2016	Dry	<	10	10
MCW-9	-	11/1/2016 ♦	Dry	<	10	10
MCW-9	-	11/2/2016	Dry	<	10	10
MCW-9	-	11/3/2016	Dry	<	10	10
MCW-9	-	11/4/2016	Dry	<	10	10
MCW-9	-	11/5/2016	Dry	<	10	10
MCW-9	-	11/6/2016	Dry	<	10	10
MCW-9	-	11/7/2016	Dry	<	10	10
MCW-9	-	11/8/2016 ♦	Dry	<	10	10
MCW-9	-	11/9/2016	Dry	<	10	10
MCW-9	-	11/10/2016	Dry	<	10	10
MCW-9	-	11/11/2016	Dry	<	10	10
MCW-9	-	11/12/2016	Dry	<	10	10
MCW-9	-	11/13/2016	Dry	<	10	10
MCW-9	-	11/14/2016	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-9	-	11/15/2016 ♦	Dry	<	10	10
MCW-9	-	11/16/2016	Dry	<	10	10
MCW-9	-	11/17/2016	Dry	<	10	10
MCW-9	-	11/18/2016	Dry	<	10	10
MCW-9	-	11/19/2016	Dry	<	10	10
MCW-9	-	11/20/2016	Dry	<	10	10
MCW-9	-	11/21/2016	Dry	<	10	10
MCW-9	-	11/22/2016 ♦	Dry	<	10	10
MCW-9	-	11/23/2016	Dry	<	10	10
MCW-9	-	11/24/2016	Dry	<	10	10
MCW-9	-	11/25/2016	Dry	<	10	10
MCW-9	-	11/26/2016	Dry	<	10	10
MCW-9	-	11/27/2016	Dry	<	10	10
MCW-9	-	11/28/2016	Dry	<	10	10
MCW-9	-	11/29/2016 ♦	Dry	<	10	10
MCW-9	-	11/30/2016	Dry	<	10	10
MCW-12	-	11/1/2016 ♦	Dry	<	10	10
MCW-12	-	11/2/2016	Dry	<	10	10
MCW-12	-	11/3/2016	Dry	<	10	10
MCW-12	-	11/4/2016	Dry	<	10	10
MCW-12	-	11/5/2016	Dry	<	10	10
MCW-12	-	11/6/2016	Dry	<	10	10
MCW-12	-	11/7/2016	Dry	<	10	10
MCW-12	-	11/8/2016 ♦	Dry	<	10	10
MCW-12	-	11/9/2016	Dry	<	10	10
MCW-12	-	11/10/2016	Dry	<	10	10
MCW-12	-	11/11/2016	Dry	<	10	10
MCW-12	-	11/12/2016	Dry	<	10	10
MCW-12	-	11/13/2016	Dry	<	10	10
MCW-12	-	11/14/2016	Dry	<	10	10
MCW-12	-	11/15/2016 ♦	Dry	<	10	10
MCW-12	-	11/16/2016	Dry	<	10	10
MCW-12	-	11/17/2016	Dry	<	10	10
MCW-12	-	11/18/2016	Dry	<	10	10
MCW-12	-	11/19/2016	Dry	<	10	10
MCW-12	-	11/20/2016	Dry	<	10	10
MCW-12	-	11/21/2016	Dry	<	10	10
MCW-12	-	11/22/2016 ♦	Dry	<	10	10
MCW-12	-	11/23/2016	Dry	<	10	10
MCW-12	-	11/24/2016	Dry	<	10	10
MCW-12	-	11/25/2016	Dry	<	10	10
MCW-12	-	11/26/2016	Dry	<	10	10
MCW-12	-	11/27/2016	Dry	<	10	10
MCW-12	-	11/28/2016	Dry	<	10	10



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-12	-	11/29/2016 ♦	Dry	<	10	10
MCW-12	-	11/30/2016	Dry	<	10	10
MCW-14b	1000	11/1/2016 ♦	Rain		**Rain**	**Rain**
MCW-14b	1000	11/2/2016	Rain		**Rain**	**Rain**
MCW-14b	1000	11/3/2016	Rain		**Rain**	**Rain**
MCW-14b	1000	11/4/2016	Rain		**Rain**	**Rain**
MCW-14b	1000	11/5/2016	Rain		**Rain**	**Rain**
MCW-14b	1000	11/6/2016	Rain		**Rain**	**Rain**
MCW-14b	1000	11/7/2016	Rain		**Rain**	**Rain**
MCW-14b	1000	11/8/2016 ♦		=	16,000	795
MCW-14b	1000	11/9/2016		=	16,000	975
MCW-14b	1000	11/10/2016		=	16,000	1,050
MCW-14b	1000	11/11/2016		=	16,000	1,132
MCW-14b	1000	11/12/2016		=	16,000	1,220
MCW-14b	1000	11/13/2016		=	16,000	1,314
MCW-14b	1000	11/14/2016		=	16,000	1,416
MCW-14b	1015	11/15/2016 ♦		=	130	1,300
MCW-14b	1015	11/16/2016		=	130	1,193
MCW-14b	1015	11/17/2016		=	130	1,095
MCW-14b	1015	11/18/2016		=	130	1,075
MCW-14b	1015	11/19/2016		=	130	1,054
MCW-14b	1015	11/20/2016		=	130	1,035
MCW-14b	1015	11/21/2016		=	130	1,015
MCW-14b	920	11/22/2016 ♦	Rain		**Rain**	**Rain**
MCW-14b	920	11/23/2016	Rain		**Rain**	**Rain**
MCW-14b	920	11/24/2016	Rain		**Rain**	**Rain**
MCW-14b	920	11/25/2016	Rain		**Rain**	**Rain**
MCW-14b	920	11/26/2016	Rain		**Rain**	**Rain**
MCW-14b	920	11/27/2016	Rain		**Rain**	**Rain**
MCW-14b	920	11/28/2016	Rain		**Rain**	**Rain**
MCW-14b	950	11/29/2016 ♦	Rain		**Rain**	**Rain**
MCW-14b	950	11/30/2016	Rain		**Rain**	**Rain**
MCW-15c	1055	11/1/2016 ♦	Rain		**Rain**	**Rain**
MCW-15c	1055	11/2/2016	Rain		**Rain**	**Rain**
MCW-15c	1055	11/3/2016	Rain		**Rain**	**Rain**
MCW-15c	1055	11/4/2016	Rain		**Rain**	**Rain**
MCW-15c	1055	11/5/2016	Rain		**Rain**	**Rain**
MCW-15c	1055	11/6/2016	Rain		**Rain**	**Rain**
MCW-15c	1055	11/7/2016	Rain		**Rain**	**Rain**
MCW-15c	920	11/8/2016 ♦		=	16,000	609
MCW-15c	920	11/9/2016		=	16,000	684
MCW-15c	920	11/10/2016		=	16,000	807
MCW-15c	920	11/11/2016		=	16,000	953
MCW-15c	920	11/12/2016		=	16,000	1,125
MCW-15c	920	11/13/2016		=	16,000	1,328



				Single Sample (adjusted for rain, dry and NDs)		Geomean
Location		Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	920	11/14/2016		=	16,000	1,568
MCW-15c	940	11/15/2016 ♦		=	170	1,591
MCW-15c	940	11/16/2016		=	170	1,614
MCW-15c	940	11/17/2016		=	170	1,638
MCW-15c	940	11/18/2016		=	170	1,621
MCW-15c	940	11/19/2016		=	170	1,605
MCW-15c	940	11/20/2016		=	170	1,589
MCW-15c	940	11/21/2016		=	170	1,573
MCW-15c	840	11/22/2016 ♦	Rain		**Rain**	**Rain**
MCW-15c	840	11/23/2016	Rain		**Rain**	**Rain**
MCW-15c	840	11/24/2016	Rain		**Rain**	**Rain**
MCW-15c	840	11/25/2016	Rain		**Rain**	**Rain**
MCW-15c	840	11/26/2016	Rain		**Rain**	**Rain**
MCW-15c	840	11/27/2016	Rain		**Rain**	**Rain**
MCW-15c	840	11/28/2016	Rain		**Rain**	**Rain**
MCW-15c	910	11/29/2016 ♦	Rain		**Rain**	**Rain**
MCW-15c	910	11/30/2016	Rain		**Rain**	**Rain**
MCW-17	-	11/1/2016 ♦	Dry	<	10	10
MCW-17	-	11/2/2016	Dry	<	10	10
MCW-17	-	11/3/2016	Dry	<	10	10
MCW-17	-	11/4/2016	Dry	<	10	10
MCW-17	-	11/5/2016	Dry	<	10	10
MCW-17	-	11/6/2016	Dry	<	10	10
MCW-17	-	11/7/2016	Dry	<	10	10
MCW-17	-	11/8/2016 ♦	Dry	<	10	10
MCW-17	-	11/9/2016	Dry	<	10	10
MCW-17	-	11/10/2016	Dry	<	10	10
MCW-17	-	11/11/2016	Dry	<	10	10
MCW-17	-	11/12/2016	Dry	<	10	10
MCW-17	-	11/13/2016	Dry	<	10	10
MCW-17	-	11/14/2016	Dry	<	10	10
MCW-17	-	11/15/2016 ♦	Dry	<	10	10
MCW-17	-	11/16/2016	Dry	<	10	10
MCW-17	-	11/17/2016	Dry	<	10	10
MCW-17	-	11/18/2016	Dry	<	10	10
MCW-17	-	11/19/2016	Dry	<	10	10
MCW-17	-	11/20/2016	Dry	<	10	10
MCW-17	-	11/21/2016	Dry	<	10	10
MCW-17	-	11/22/2016 ♦	Dry	<	10	10
MCW-17	-	11/23/2016	Dry	<	10	10
MCW-17	-	11/24/2016	Dry	<	10	10
MCW-17	-	11/25/2016	Dry	<	10	10
MCW-17	-	11/26/2016	Dry	<	10	10
MCW-17	-	11/27/2016	Dry	<	10	10
MCW-17	-	11/28/2016	Dry	<	10	10
MCW-17	-	11/29/2016 ♦	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-17	-	11/30/2016	Dry	<	10	10
MCW-18	-	11/1/2016 ♦	Dry	<	10	10
MCW-18	-	11/2/2016	Dry	<	10	10
MCW-18	-	11/3/2016	Dry	<	10	10
MCW-18	-	11/4/2016	Dry	<	10	10
MCW-18	-	11/5/2016	Dry	<	10	10
MCW-18	-	11/6/2016	Dry	<	10	10
MCW-18	-	11/7/2016	Dry	<	10	10
MCW-18	-	11/8/2016 ♦	Dry	<	10	10
MCW-18	-	11/9/2016	Dry	<	10	10
MCW-18	-	11/10/2016	Dry	<	10	10
MCW-18	-	11/11/2016	Dry	<	10	10
MCW-18	-	11/12/2016	Dry	<	10	10
MCW-18	-	11/13/2016	Dry	<	10	10
MCW-18	-	11/14/2016	Dry	<	10	10
MCW-18	-	11/15/2016 ♦	Dry	<	10	10
MCW-18	-	11/16/2016	Dry	<	10	10
MCW-18	-	11/17/2016	Dry	<	10	10
MCW-18	-	11/18/2016	Dry	<	10	10
MCW-18	-	11/19/2016	Dry	<	10	10
MCW-18	-	11/20/2016	Dry	<	10	10
MCW-18	-	11/21/2016	Dry	<	10	10
MCW-18	-	11/22/2016 ♦	Dry	<	10	10
MCW-18	-	11/23/2016	Dry	<	10	10
MCW-18	-	11/24/2016	Dry	<	10	10
MCW-18	-	11/25/2016	Dry	<	10	10
MCW-18	-	11/26/2016	Dry	<	10	10
MCW-18	-	11/27/2016	Dry	<	10	10
MCW-18	-	11/28/2016	Dry	<	10	10
MCW-18	-	11/29/2016 ♦	Dry	<	10	10
MCW-18	-	11/30/2016	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



April 21, 2017

Central Services Department
J. Tabin Cosio, Director

Engineering Services Department
Christopher E. Cooper, Director

Transportation Department
David L. Fleisch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Glenn Shephard, Director

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND
OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of March 2017. Sites were sampled weekly on Tuesdays (March 14, 21 and 28), except for one instance when sites were sampled Wednesday (March 8) due to staffing conflicts. Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm
Deputy Director, Watershed Protection District

CC: Glenn Shephard, Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	1140	3/8/2017 ♦		<	20
MCW-8b	1050	3/14/2017 ♦		<	20
MCW-8b	1235	3/21/2017 ♦		=	40
MCW-8b	1155	3/28/2017 ♦		<	20
MCW-9	-	3/8/2017 ♦			Dry
MCW-9	-	3/14/2017 ♦			Dry
MCW-9	-	3/21/2017 ♦			Dry
MCW-9	-	3/28/2017 ♦			Dry
MCW-12	1045	3/8/2017 ♦		<	20
MCW-12	1000	3/14/2017 ♦		<	20
MCW-12	1130	3/21/2017 ♦		=	40
MCW-12	1100	3/28/2017 ♦		=	110
MCW-14b	1000	3/8/2017 ♦		<	20
MCW-14b	920	3/14/2017 ♦		<	20
MCW-14b	1045	3/21/2017 ♦		=	500
MCW-14b	1035	3/28/2017 ♦		=	170
MCW-15c	935	3/8/2017 ♦		<	20
MCW-15c	840	3/14/2017 ♦		=	20
MCW-15c	1000	3/21/2017 ♦		=	300
MCW-15c	955	3/28/2017 ♦		=	210
MCW-17	900	3/8/2017 ♦		<	20
MCW-17	800	3/14/2017 ♦		=	20
MCW-17	915	3/21/2017 ♦		=	300
MCW-17	915	3/28/2017 ♦		=	70
MCW-18	-	3/8/2017 ♦			Dry
MCW-18	-	3/14/2017 ♦			Dry
MCW-18	-	3/21/2017 ♦			Dry
MCW-18	-	3/28/2017 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-8b	1130	3/1/2017		**Rain**		**Rain**
MCW-8b	1130	3/2/2017		**Rain**		**Rain**
MCW-8b	1130	3/3/2017		**Rain**		**Rain**
MCW-8b	1130	3/4/2017		**Rain**		**Rain**
MCW-8b	1130	3/5/2017		**Rain**		**Rain**
MCW-8b	1130	3/6/2017		**Rain**		**Rain**
MCW-8b	1130	3/7/2017		**Rain**		**Rain**
MCW-8b	1140	3/8/2017 ♦	<	10		25
MCW-8b	1140	3/9/2017	<	10		25
MCW-8b	1140	3/10/2017	<	10		25
MCW-8b	1140	3/11/2017	<	10		25
MCW-8b	1140	3/12/2017	<	10		25
MCW-8b	1140	3/13/2017	<	10		25
MCW-8b	1050	3/14/2017 ♦	<	10		25
MCW-8b	1050	3/15/2017	<	10		25
MCW-8b	1050	3/16/2017	<	10		25
MCW-8b	1050	3/17/2017	<	10		25
MCW-8b	1050	3/18/2017	<	10		25
MCW-8b	1050	3/19/2017	<	10		25
MCW-8b	1050	3/20/2017	<	10		25
MCW-8b	1235	3/21/2017 ♦	=	40		26
MCW-8b	1235	3/22/2017	=	40		27
MCW-8b	1235	3/23/2017	=	40		28
MCW-8b	1235	3/24/2017	=	40		29
MCW-8b	1235	3/25/2017	=	40		28
MCW-8b	1235	3/26/2017	=	40		28
MCW-8b	1235	3/27/2017	=	40		27
MCW-8b	1155	3/28/2017 ♦	<	10		26
MCW-8b	1155	3/29/2017	<	10		24
MCW-8b	1155	3/30/2017	<	10		23
MCW-8b	1155	3/31/2017	<	10		21
MCW-9	-	3/1/2017	Dry	<	10	10
MCW-9	-	3/2/2017	Dry	<	10	10
MCW-9	-	3/3/2017	Dry	<	10	10
MCW-9	-	3/4/2017	Dry	<	10	10
MCW-9	-	3/5/2017	Dry	<	10	10
MCW-9	-	3/6/2017	Dry	<	10	10
MCW-9	-	3/7/2017	Dry	<	10	10
MCW-9	-	3/8/2017 ♦	Dry	<	10	10
MCW-9	-	3/9/2017	Dry	<	10	10
MCW-9	-	3/10/2017	Dry	<	10	10
MCW-9	-	3/11/2017	Dry	<	10	10
MCW-9	-	3/12/2017	Dry	<	10	10
MCW-9	-	3/13/2017	Dry	<	10	10



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-9	-	3/14/2017 ♦	Dry	<	10	10
MCW-9	-	3/15/2017	Dry	<	10	10
MCW-9	-	3/16/2017	Dry	<	10	10
MCW-9	-	3/17/2017	Dry	<	10	10
MCW-9	-	3/18/2017	Dry	<	10	10
MCW-9	-	3/19/2017	Dry	<	10	10
MCW-9	-	3/20/2017	Dry	<	10	10
MCW-9	-	3/21/2017 ♦	Dry	<	10	10
MCW-9	-	3/22/2017	Dry	<	10	10
MCW-9	-	3/23/2017	Dry	<	10	10
MCW-9	-	3/24/2017	Dry	<	10	10
MCW-9	-	3/25/2017	Dry	<	10	10
MCW-9	-	3/26/2017	Dry	<	10	10
MCW-9	-	3/27/2017	Dry	<	10	10
MCW-9	-	3/28/2017 ♦	Dry	<	10	10
MCW-9	-	3/29/2017	Dry	<	10	10
MCW-9	-	3/30/2017	Dry	<	10	10
MCW-9	-	3/31/2017	Dry	<	10	10
MCW-12	1000	3/1/2017			**Rain**	**Rain**
MCW-12	1000	3/2/2017			**Rain**	**Rain**
MCW-12	1000	3/3/2017			**Rain**	**Rain**
MCW-12	1000	3/4/2017			**Rain**	**Rain**
MCW-12	1000	3/5/2017			**Rain**	**Rain**
MCW-12	1000	3/6/2017			**Rain**	**Rain**
MCW-12	1000	3/7/2017			**Rain**	**Rain**
MCW-12	1045	3/8/2017 ♦		<	10	72
MCW-12	1045	3/9/2017		<	10	64
MCW-12	1045	3/10/2017		<	10	61
MCW-12	1045	3/11/2017		<	10	59
MCW-12	1045	3/12/2017		<	10	56
MCW-12	1045	3/13/2017		<	10	53
MCW-12	1000	3/14/2017 ♦		<	10	51
MCW-12	1000	3/15/2017		<	10	49
MCW-12	1000	3/16/2017		<	10	47
MCW-12	1000	3/17/2017		<	10	44
MCW-12	1000	3/18/2017		<	10	41
MCW-12	1000	3/19/2017		<	10	38
MCW-12	1000	3/20/2017		<	10	36
MCW-12	1130	3/21/2017 ♦		=	40	35
MCW-12	1130	3/22/2017		=	40	35
MCW-12	1130	3/23/2017		=	40	34
MCW-12	1130	3/24/2017		=	40	34
MCW-12	1130	3/25/2017		=	40	33
MCW-12	1130	3/26/2017		=	40	32



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-12	1130	3/27/2017	=	40		30
MCW-12	1100	3/28/2017 ♦	=	110		30
MCW-12	1100	3/29/2017	=	110		30
MCW-12	1100	3/30/2017	=	110		30
MCW-12	1100	3/31/2017	=	110		30
MCW-14b	915	3/1/2017		**Rain**		**Rain**
MCW-14b	915	3/2/2017		**Rain**		**Rain**
MCW-14b	915	3/3/2017		**Rain**		**Rain**
MCW-14b	915	3/4/2017		**Rain**		**Rain**
MCW-14b	915	3/5/2017		**Rain**		**Rain**
MCW-14b	915	3/6/2017		**Rain**		**Rain**
MCW-14b	915	3/7/2017		**Rain**		**Rain**
MCW-14b	1000	3/8/2017 ♦	<	10		33
MCW-14b	1000	3/9/2017	<	10		30
MCW-14b	1000	3/10/2017	<	10		28
MCW-14b	1000	3/11/2017	<	10		26
MCW-14b	1000	3/12/2017	<	10		25
MCW-14b	1000	3/13/2017	<	10		23
MCW-14b	920	3/14/2017 ♦	<	10		22
MCW-14b	920	3/15/2017	<	10		20
MCW-14b	920	3/16/2017	<	10		19
MCW-14b	920	3/17/2017	<	10		19
MCW-14b	920	3/18/2017	<	10		18
MCW-14b	920	3/19/2017	<	10		18
MCW-14b	920	3/20/2017	<	10		17
MCW-14b	1045	3/21/2017 ♦	=	500		19
MCW-14b	1045	3/22/2017	=	500		22
MCW-14b	1045	3/23/2017	=	500		24
MCW-14b	1045	3/24/2017	=	500		26
MCW-14b	1045	3/25/2017	=	500		28
MCW-14b	1045	3/26/2017	=	500		30
MCW-14b	1045	3/27/2017	=	500		32
MCW-14b	1035	3/28/2017 ♦	=	170		32
MCW-14b	1035	3/29/2017	=	170		33
MCW-14b	1035	3/30/2017	=	170		34
MCW-14b	1035	3/31/2017	=	170		35
MCW-15c	835	3/1/2017		**Rain**		**Rain**
MCW-15c	835	3/2/2017		**Rain**		**Rain**
MCW-15c	835	3/3/2017		**Rain**		**Rain**
MCW-15c	835	3/4/2017		**Rain**		**Rain**
MCW-15c	835	3/5/2017		**Rain**		**Rain**
MCW-15c	835	3/6/2017		**Rain**		**Rain**
MCW-15c	835	3/7/2017		**Rain**		**Rain**
MCW-15c	935	3/8/2017 ♦	<	10		15
MCW-15c	935	3/9/2017	<	10		14



				Single Sample (adjusted for rain, dry and NDs)		Geomean
Location		Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	935	3/10/2017		<	10	14
MCW-15c	935	3/11/2017		<	10	14
MCW-15c	935	3/12/2017		<	10	14
MCW-15c	935	3/13/2017		<	10	14
MCW-15c	840	3/14/2017 ♦		=	20	14
MCW-15c	840	3/15/2017		=	20	14
MCW-15c	840	3/16/2017		=	20	15
MCW-15c	840	3/17/2017		=	20	15
MCW-15c	840	3/18/2017		=	20	15
MCW-15c	840	3/19/2017		=	20	15
MCW-15c	840	3/20/2017		=	20	15
MCW-15c	1000	3/21/2017 ♦		=	300	16
MCW-15c	1000	3/22/2017		=	300	18
MCW-15c	1000	3/23/2017		=	300	19
MCW-15c	1000	3/24/2017		=	300	21
MCW-15c	1000	3/25/2017		=	300	23
MCW-15c	1000	3/26/2017		=	300	25
MCW-15c	1000	3/27/2017		=	300	28
MCW-15c	955	3/28/2017 ♦		=	210	30
MCW-15c	955	3/29/2017		=	210	32
MCW-15c	955	3/30/2017		=	210	35
MCW-15c	955	3/31/2017		=	210	37
MCW-17	800	3/1/2017			**Rain**	**Rain**
MCW-17	800	3/2/2017			**Rain**	**Rain**
MCW-17	800	3/3/2017			**Rain**	**Rain**
MCW-17	800	3/4/2017			**Rain**	**Rain**
MCW-17	800	3/5/2017			**Rain**	**Rain**
MCW-17	800	3/6/2017			**Rain**	**Rain**
MCW-17	800	3/7/2017			**Rain**	**Rain**
MCW-17	900	3/8/2017 ♦		<	10	12
MCW-17	900	3/9/2017		<	10	12
MCW-17	900	3/10/2017		<	10	12
MCW-17	900	3/11/2017		<	10	12
MCW-17	900	3/12/2017		<	10	12
MCW-17	900	3/13/2017		<	10	12
MCW-17	800	3/14/2017 ♦		=	20	12
MCW-17	800	3/15/2017		=	20	12
MCW-17	800	3/16/2017		=	20	13
MCW-17	800	3/17/2017		=	20	13
MCW-17	800	3/18/2017		=	20	13
MCW-17	800	3/19/2017		=	20	14
MCW-17	800	3/20/2017		=	20	14
MCW-17	915	3/21/2017 ♦		=	300	15
MCW-17	915	3/22/2017		=	300	17
MCW-17	915	3/23/2017		=	300	19
MCW-17	915	3/24/2017		=	300	21



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-17	915	3/25/2017		=	300	24
MCW-17	915	3/26/2017		=	300	26
MCW-17	915	3/27/2017		=	300	29
MCW-17	915	3/28/2017 ♦		=	70	31
MCW-17	915	3/29/2017		=	70	33
MCW-17	915	3/30/2017		=	70	36
MCW-17	915	3/31/2017		=	70	38
MCW-18	-	3/1/2017	Dry	<	10	10
MCW-18	-	3/2/2017	Dry	<	10	10
MCW-18	-	3/3/2017	Dry	<	10	10
MCW-18	-	3/4/2017	Dry	<	10	10
MCW-18	-	3/5/2017	Dry	<	10	10
MCW-18	-	3/6/2017	Dry	<	10	10
MCW-18	-	3/7/2017	Dry	<	10	10
MCW-18	-	3/8/2017 ♦	Dry	<	10	10
MCW-18	-	3/9/2017	Dry	<	10	10
MCW-18	-	3/10/2017	Dry	<	10	10
MCW-18	-	3/11/2017	Dry	<	10	10
MCW-18	-	3/12/2017	Dry	<	10	10
MCW-18	-	3/13/2017	Dry	<	10	10
MCW-18	-	3/14/2017 ♦	Dry	<	10	10
MCW-18	-	3/15/2017	Dry	<	10	10
MCW-18	-	3/16/2017	Dry	<	10	10
MCW-18	-	3/17/2017	Dry	<	10	10
MCW-18	-	3/18/2017	Dry	<	10	10
MCW-18	-	3/19/2017	Dry	<	10	10
MCW-18	-	3/20/2017	Dry	<	10	10
MCW-18	-	3/21/2017 ♦	Dry	<	10	10
MCW-18	-	3/22/2017	Dry	<	10	10
MCW-18	-	3/23/2017	Dry	<	10	10
MCW-18	-	3/24/2017	Dry	<	10	10
MCW-18	-	3/25/2017	Dry	<	10	10
MCW-18	-	3/26/2017	Dry	<	10	10
MCW-18	-	3/27/2017	Dry	<	10	10
MCW-18	-	3/28/2017 ♦	Dry	<	10	10
MCW-18	-	3/29/2017	Dry	<	10	10
MCW-18	-	3/30/2017	Dry	<	10	10
MCW-18	-	3/31/2017	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



January 23, 2017

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Cosio, Director

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Michaela Brown, Director

Watershed Protection District
Glenn Shephard, Director

**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of December 2016. Sites were sampled weekly on Tuesdays (December 6, 13, 20 and 27). Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm

Deputy Director, Watershed Protection District

CC: Glenn Shephard, Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	-	12/6/2016 ♦			Dry
MCW-8b	-	12/13/2016 ♦			Dry
MCW-8b	-	12/20/2016 ♦			Dry
MCW-8b	-	12/27/2016 ♦			Dry
MCW-9	-	12/6/2016 ♦			Dry
MCW-9	-	12/13/2016 ♦			Dry
MCW-9	-	12/20/2016 ♦			Dry
MCW-9	-	12/27/2016 ♦			Dry
MCW-12	-	12/6/2016 ♦			Dry
MCW-12	-	12/13/2016 ♦			Dry
MCW-12	-	12/20/2016 ♦			Dry
MCW-12	1140	12/27/2016 ♦	=		300
MCW-14b	855	12/6/2016 ♦	=		170
MCW-14b	1000	12/13/2016 ♦	=		230
MCW-14b	100	12/20/2016 ♦	=		40
MCW-14b	1050	12/27/2016 ♦	=		140
MCW-15c	945	12/6/2016 ♦	=		80
MCW-15c	920	12/13/2016 ♦	=		220
MCW-15c	1215	12/20/2016 ♦	=		40
MCW-15c	1000	12/27/2016 ♦	=		80
MCW-17	-	12/6/2016 ♦			Dry
MCW-17	-	12/13/2016 ♦			Dry
MCW-17	-	12/20/2016 ♦			Dry
MCW-17	-	12/27/2016 ♦			Dry
MCW-18	-	12/6/2016 ♦			Dry
MCW-18	-	12/13/2016 ♦			Dry
MCW-18	-	12/20/2016 ♦			Dry
MCW-18	-	12/27/2016 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-8b	-	12/1/2016	Dry	<	10	10
MCW-8b	-	12/2/2016	Dry	<	10	10
MCW-8b	-	12/3/2016	Dry	<	10	10
MCW-8b	-	12/4/2016	Dry	<	10	10
MCW-8b	-	12/5/2016	Dry	<	10	10
MCW-8b	-	12/6/2016 ♦	Dry	<	10	10
MCW-8b	-	12/7/2016	Dry	<	10	10
MCW-8b	-	12/8/2016	Dry	<	10	10
MCW-8b	-	12/9/2016	Dry	<	10	10
MCW-8b	-	12/10/2016	Dry	<	10	10
MCW-8b	-	12/11/2016	Dry	<	10	10
MCW-8b	-	12/12/2016	Dry	<	10	10
MCW-8b	-	12/13/2016 ♦	Dry	<	10	10
MCW-8b	-	12/14/2016	Dry	<	10	10
MCW-8b	-	12/15/2016	Dry	<	10	10
MCW-8b	-	12/16/2016	Dry	<	10	10
MCW-8b	-	12/17/2016	Dry	<	10	10
MCW-8b	-	12/18/2016	Dry	<	10	10
MCW-8b	-	12/19/2016	Dry	<	10	10
MCW-8b	-	12/20/2016 ♦	Dry	<	10	10
MCW-8b	-	12/21/2016	Dry	<	10	10
MCW-8b	-	12/22/2016	Dry	<	10	10
MCW-8b	-	12/23/2016	Dry	<	10	10
MCW-8b	-	12/24/2016	Dry	<	10	10
MCW-8b	-	12/25/2016	Dry	<	10	10
MCW-8b	-	12/26/2016	Dry	<	10	10
MCW-8b	-	12/27/2016 ♦	Dry	<	10	10
MCW-8b	-	12/28/2016	Dry	<	10	10
MCW-8b	-	12/29/2016	Dry	<	10	10
MCW-8b	-	12/30/2016	Dry	<	10	10
MCW-8b	-	12/31/2016	Dry	<	10	10
MCW-9	-	12/1/2016	Dry	<	10	10
MCW-9	-	12/2/2016	Dry	<	10	10
MCW-9	-	12/3/2016	Dry	<	10	10
MCW-9	-	12/4/2016	Dry	<	10	10
MCW-9	-	12/5/2016	Dry	<	10	10
MCW-9	-	12/6/2016 ♦	Dry	<	10	10
MCW-9	-	12/7/2016	Dry	<	10	10
MCW-9	-	12/8/2016	Dry	<	10	10
MCW-9	-	12/9/2016	Dry	<	10	10
MCW-9	-	12/10/2016	Dry	<	10	10
MCW-9	-	12/11/2016	Dry	<	10	10
MCW-9	-	12/12/2016	Dry	<	10	10
MCW-9	-	12/13/2016 ♦	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-9	-	12/14/2016	Dry	<	10	10
MCW-9	-	12/15/2016	Dry	<	10	10
MCW-9	-	12/16/2016	Dry	<	10	10
MCW-9	-	12/17/2016	Dry	<	10	10
MCW-9	-	12/18/2016	Dry	<	10	10
MCW-9	-	12/19/2016	Dry	<	10	10
MCW-9	-	12/20/2016◆	Dry	<	10	10
MCW-9	-	12/21/2016	Dry	<	10	10
MCW-9	-	12/22/2016	Dry	<	10	10
MCW-9	-	12/23/2016	Dry	<	10	10
MCW-9	-	12/24/2016	Dry	<	10	10
MCW-9	-	12/25/2016	Dry	<	10	10
MCW-9	-	12/26/2016	Dry	<	10	10
MCW-9	-	12/27/2016◆	Dry	<	10	10
MCW-9	-	12/28/2016	Dry	<	10	10
MCW-9	-	12/29/2016	Dry	<	10	10
MCW-9	-	12/30/2016	Dry	<	10	10
MCW-9	-	12/31/2016	Dry	<	10	10
MCW-12	-	12/1/2016	Dry	<	10	10
MCW-12	-	12/2/2016	Dry	<	10	10
MCW-12	-	12/3/2016	Dry	<	10	10
MCW-12	-	12/4/2016	Dry	<	10	10
MCW-12	-	12/5/2016	Dry	<	10	10
MCW-12	-	12/6/2016◆	Dry	<	10	10
MCW-12	-	12/7/2016	Dry	<	10	10
MCW-12	-	12/8/2016	Dry	<	10	10
MCW-12	-	12/9/2016	Dry	<	10	10
MCW-12	-	12/10/2016	Dry	<	10	10
MCW-12	-	12/11/2016	Dry	<	10	10
MCW-12	-	12/12/2016	Dry	<	10	10
MCW-12	-	12/13/2016◆	Dry	<	10	10
MCW-12	-	12/14/2016	Dry	<	10	10
MCW-12	-	12/15/2016	Dry	<	10	10
MCW-12	-	12/16/2016	Dry	<	10	10
MCW-12	-	12/17/2016	Dry	<	10	10
MCW-12	-	12/18/2016	Dry	<	10	10
MCW-12	-	12/19/2016	Dry	<	10	10
MCW-12	-	12/20/2016◆	Dry	<	10	10
MCW-12	-	12/21/2016	Dry	<	10	10
MCW-12	-	12/22/2016	Dry	<	10	10
MCW-12	-	12/23/2016	Dry	<	10	10
MCW-12	-	12/24/2016	Dry	<	10	10
MCW-12	-	12/25/2016	Dry	<	10	10
MCW-12	-	12/26/2016	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-12	1140	12/27/2016 ♦		=	300	11
MCW-12	1140	12/28/2016		=	300	13
MCW-12	1140	12/29/2016		=	300	14
MCW-12	1140	12/30/2016		=	300	16
MCW-12	1140	12/31/2016		=	300	18
MCW-14b	950	12/1/2016	Rain		**Rain**	**Rain**
MCW-14b	950	12/2/2016	Rain		**Rain**	**Rain**
MCW-14b	950	12/3/2016	Rain		**Rain**	**Rain**
MCW-14b	950	12/4/2016	Rain		**Rain**	**Rain**
MCW-14b	950	12/5/2016	Rain		**Rain**	**Rain**
MCW-14b	855	12/6/2016 ♦		=	170	1,005
MCW-14b	855	12/7/2016		=	170	995
MCW-14b	855	12/8/2016		=	170	904
MCW-14b	855	12/9/2016		=	170	822
MCW-14b	855	12/10/2016		=	170	747
MCW-14b	855	12/11/2016		=	170	678
MCW-14b	855	12/12/2016		=	170	617
MCW-14b	1000	12/13/2016 ♦		=	230	566
MCW-14b	1000	12/14/2016		=	230	520
MCW-14b	1000	12/15/2016		=	230	517
MCW-14b	1000	12/16/2016		=	230	515
MCW-14b	1000	12/17/2016		=	230	513
MCW-14b	1000	12/18/2016		=	230	511
MCW-14b	1000	12/19/2016		=	230	509
MCW-14b	100	12/20/2016 ♦		=	40	478
MCW-14b	100	12/21/2016		=	40	449
MCW-14b	100	12/22/2016		=	40	368
MCW-14b	100	12/23/2016		=	40	301
MCW-14b	100	12/24/2016		=	40	247
MCW-14b	100	12/25/2016		=	40	202
MCW-14b	100	12/26/2016		=	40	166
MCW-14b	1050	12/27/2016 ♦		=	140	141
MCW-14b	1050	12/28/2016		=	140	121
MCW-14b	1050	12/29/2016		=	140	121
MCW-14b	1050	12/30/2016		=	140	121
MCW-14b	1050	12/31/2016		=	140	122
MCW-15c	910	12/1/2016	Rain		**Rain**	**Rain**
MCW-15c	910	12/2/2016	Rain		**Rain**	**Rain**
MCW-15c	910	12/3/2016	Rain		**Rain**	**Rain**
MCW-15c	910	12/4/2016	Rain		**Rain**	**Rain**
MCW-15c	910	12/5/2016	Rain		**Rain**	**Rain**
MCW-15c	945	12/6/2016 ♦		=	80	1,519
MCW-15c	945	12/7/2016		=	80	1,466
MCW-15c	945	12/8/2016		=	80	1,299
MCW-15c	945	12/9/2016		=	80	1,151



				Single Sample (adjusted for rain, dry and NDs)		Geomean
Location		Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	945	12/10/2016		=	80	1,020
MCW-15c	945	12/11/2016		=	80	904
MCW-15c	945	12/12/2016		=	80	801
MCW-15c	920	12/13/2016 ♦		=	220	735
MCW-15c	920	12/14/2016		=	220	673
MCW-15c	920	12/15/2016		=	220	635
MCW-15c	920	12/16/2016		=	220	598
MCW-15c	920	12/17/2016		=	220	564
MCW-15c	920	12/18/2016		=	220	531
MCW-15c	920	12/19/2016		=	220	501
MCW-15c	1215	12/20/2016 ♦		=	40	446
MCW-15c	1215	12/21/2016		=	40	397
MCW-15c	1215	12/22/2016		=	40	325
MCW-15c	1215	12/23/2016		=	40	266
MCW-15c	1215	12/24/2016		=	40	218
MCW-15c	1215	12/25/2016		=	40	179
MCW-15c	1215	12/26/2016		=	40	146
MCW-15c	1000	12/27/2016 ♦		=	80	123
MCW-15c	1000	12/28/2016		=	80	103
MCW-15c	1000	12/29/2016		=	80	100
MCW-15c	1000	12/30/2016		=	80	98
MCW-15c	1000	12/31/2016		=	80	95
MCW-17	-	12/1/2016	Dry	<	10	10
MCW-17	-	12/2/2016	Dry	<	10	10
MCW-17	-	12/3/2016	Dry	<	10	10
MCW-17	-	12/4/2016	Dry	<	10	10
MCW-17	-	12/5/2016	Dry	<	10	10
MCW-17	-	12/6/2016 ♦	Dry	<	10	10
MCW-17	-	12/7/2016	Dry	<	10	10
MCW-17	-	12/8/2016	Dry	<	10	10
MCW-17	-	12/9/2016	Dry	<	10	10
MCW-17	-	12/10/2016	Dry	<	10	10
MCW-17	-	12/11/2016	Dry	<	10	10
MCW-17	-	12/12/2016	Dry	<	10	10
MCW-17	-	12/13/2016 ♦	Dry	<	10	10
MCW-17	-	12/14/2016	Dry	<	10	10
MCW-17	-	12/15/2016	Dry	<	10	10
MCW-17	-	12/16/2016	Dry	<	10	10
MCW-17	-	12/17/2016	Dry	<	10	10
MCW-17	-	12/18/2016	Dry	<	10	10
MCW-17	-	12/19/2016	Dry	<	10	10
MCW-17	-	12/20/2016 ♦	Dry	<	10	10
MCW-17	-	12/21/2016	Dry	<	10	10
MCW-17	-	12/22/2016	Dry	<	10	10
MCW-17	-	12/23/2016	Dry	<	10	10
MCW-17	-	12/24/2016	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-17	-	12/25/2016	Dry	<	10	10
MCW-17	-	12/26/2016	Dry	<	10	10
MCW-17	-	12/27/2016 ♦	Dry	<	10	10
MCW-17	-	12/28/2016	Dry	<	10	10
MCW-17	-	12/29/2016	Dry	<	10	10
MCW-17	-	12/30/2016	Dry	<	10	10
MCW-17	-	12/31/2016	Dry	<	10	10
MCW-18	-	12/1/2016	Dry	<	10	10
MCW-18	-	12/2/2016	Dry	<	10	10
MCW-18	-	12/3/2016	Dry	<	10	10
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MCW-18	-	12/5/2016	Dry	<	10	10
MCW-18	-	12/6/2016 ♦	Dry	<	10	10
MCW-18	-	12/7/2016	Dry	<	10	10
MCW-18	-	12/8/2016	Dry	<	10	10
MCW-18	-	12/9/2016	Dry	<	10	10
MCW-18	-	12/10/2016	Dry	<	10	10
MCW-18	-	12/11/2016	Dry	<	10	10
MCW-18	-	12/12/2016	Dry	<	10	10
MCW-18	-	12/13/2016 ♦	Dry	<	10	10
MCW-18	-	12/14/2016	Dry	<	10	10
MCW-18	-	12/15/2016	Dry	<	10	10
MCW-18	-	12/16/2016	Dry	<	10	10
MCW-18	-	12/17/2016	Dry	<	10	10
MCW-18	-	12/18/2016	Dry	<	10	10
MCW-18	-	12/19/2016	Dry	<	10	10
MCW-18	-	12/20/2016 ♦	Dry	<	10	10
MCW-18	-	12/21/2016	Dry	<	10	10
MCW-18	-	12/22/2016	Dry	<	10	10
MCW-18	-	12/23/2016	Dry	<	10	10
MCW-18	-	12/24/2016	Dry	<	10	10
MCW-18	-	12/25/2016	Dry	<	10	10
MCW-18	-	12/26/2016	Dry	<	10	10
MCW-18	-	12/27/2016 ♦	Dry	<	10	10
MCW-18	-	12/28/2016	Dry	<	10	10
MCW-18	-	12/29/2016	Dry	<	10	10
MCW-18	-	12/30/2016	Dry	<	10	10
MCW-18	-	12/31/2016	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



February 23, 2017

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
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Watershed Protection District
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**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND
OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of January 2017. Sites were sampled weekly on Tuesdays (January 3, 10, 17, 24 and 31). Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm

Deputy Director, Watershed Protection District

CC: Glenn Shephard, Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
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Allen Ma, County of Los Angeles (via email)

Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	-	1/3/2017 ♦			Dry
MCW-8b	-	1/10/2017 ♦	Rain		Dry
MCW-8b	-	1/17/2017 ♦			Dry
MCW-8b	1200	1/24/2017 ♦	Rain	=	80
MCW-8b	900	1/31/2017 ♦		=	70
MCW-9	-	1/3/2017 ♦			Dry
MCW-9	-	1/10/2017 ♦	Rain		Dry
MCW-9	-	1/17/2017 ♦			Dry
MCW-9	-	1/24/2017 ♦	Rain		Dry
MCW-9	-	1/31/2017 ♦			Dry
MCW-12	1015	1/3/2017 ♦		=	40
MCW-12	1000	1/10/2017 ♦	Rain	=	2400
MCW-12	1000	1/17/2017 ♦		=	70
MCW-12	1100	1/24/2017 ♦	Rain	=	500
MCW-12	815	1/31/2017 ♦		=	130
MCW-14b	930	1/3/2017 ♦		=	70
MCW-14b	915	1/10/2017 ♦	Rain	=	300
MCW-14b	1055	1/17/2017 ♦		=	20
MCW-14b	1020	1/24/2017 ♦	Rain	=	500
MCW-14b	945	1/31/2017 ♦		=	80
MCW-15c	900	1/3/2017 ♦		<	20
MCW-15c	820	1/10/2017 ♦	Rain	=	500
MCW-15c	1140	1/17/2017 ♦		=	20
MCW-15c	940	1/24/2017 ♦	Rain	<	20
MCW-15c	1035	1/31/2017 ♦		=	20
MCW-17	-	1/3/2017 ♦			Dry
MCW-17	-	1/10/2017 ♦	Rain		Dry
MCW-17	-	1/17/2017 ♦			Dry
MCW-17	900	1/24/2017 ♦	Rain	=	110
MCW-17	1110	1/31/2017 ♦		<	20
MCW-18	-	1/3/2017 ♦			Dry
MCW-18	-	1/10/2017 ♦	Rain		Dry
MCW-18	-	1/17/2017 ♦			Dry
MCW-18	-	1/24/2017 ♦	Rain		Dry
MCW-18	-	1/31/2017 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli (235 MPN)		E. coli (126 MPN)
MCW-8b	-	1/1/2017	Dry	<	10	10
MCW-8b	-	1/2/2017	Dry	<	10	10
MCW-8b	-	1/3/2017 ♦	Dry	<	10	10
MCW-8b	-	1/4/2017	Dry	<	10	10
MCW-8b	-	1/5/2017	Dry	<	10	10
MCW-8b	-	1/6/2017	Dry	<	10	10
MCW-8b	-	1/7/2017	Dry	<	10	10
MCW-8b	-	1/8/2017	Dry	<	10	10
MCW-8b	-	1/9/2017	Dry	<	10	10
MCW-8b	-	1/10/2017 ♦	Rain		**Rain**	**Rain**
MCW-8b	-	1/11/2017	Rain		**Rain**	**Rain**
MCW-8b	-	1/12/2017	Rain		**Rain**	**Rain**
MCW-8b	-	1/13/2017	Rain		**Rain**	**Rain**
MCW-8b	-	1/14/2017	Rain		**Rain**	**Rain**
MCW-8b	-	1/15/2017	Rain		**Rain**	**Rain**
MCW-8b	-	1/16/2017	Rain		**Rain**	**Rain**
MCW-8b	-	1/17/2017 ♦	Dry	<	10	10
MCW-8b	-	1/18/2017	Dry	<	10	10
MCW-8b	-	1/19/2017	Dry	<	10	10
MCW-8b	-	1/20/2017	Dry	<	10	10
MCW-8b	-	1/21/2017	Dry	<	10	10
MCW-8b	-	1/22/2017	Dry	<	10	10
MCW-8b	-	1/23/2017	Dry	<	10	10
MCW-8b	1200	1/24/2017 ♦	Rain		**Rain**	**Rain**
MCW-8b	1200	1/25/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	1/26/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	1/27/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	1/28/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	1/29/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	1/30/2017	Rain		**Rain**	**Rain**
MCW-8b	900	1/31/2017 ♦		=	70	11
MCW-9	-	1/1/2017	Dry	<	10	10
MCW-9	-	1/2/2017	Dry	<	10	10
MCW-9	-	1/3/2017 ♦	Dry	<	10	10
MCW-9	-	1/4/2017	Dry	<	10	10
MCW-9	-	1/5/2017	Dry	<	10	10
MCW-9	-	1/6/2017	Dry	<	10	10
MCW-9	-	1/7/2017	Dry	<	10	10
MCW-9	-	1/8/2017	Dry	<	10	10
MCW-9	-	1/9/2017	Dry	<	10	10
MCW-9	-	1/10/2017 ♦	Rain		**Rain**	**Rain**
MCW-9	-	1/11/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/12/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/13/2017	Rain		**Rain**	**Rain**
				Single Sample (adjusted for rain, dry and NDs)		Geomean



Location	Time	Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-9	-	1/14/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/15/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/16/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/17/2017 ♦	Dry	<	10	10
MCW-9	-	1/18/2017	Dry	<	10	10
MCW-9	-	1/19/2017	Dry	<	10	10
MCW-9	-	1/20/2017	Dry	<	10	10
MCW-9	-	1/21/2017	Dry	<	10	10
MCW-9	-	1/22/2017	Dry	<	10	10
MCW-9	-	1/23/2017	Dry	<	10	10
MCW-9	-	1/24/2017 ♦	Rain		**Rain**	**Rain**
MCW-9	-	1/25/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/26/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/27/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/28/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/29/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/30/2017	Rain		**Rain**	**Rain**
MCW-9	-	1/31/2017 ♦	Dry	<	10	10
MCW-12	1140	1/1/2017		=	300	20
MCW-12	1140	1/2/2017		=	300	22
MCW-12	1015	1/3/2017 ♦		=	40	23
MCW-12	1015	1/4/2017		=	40	24
MCW-12	1015	1/5/2017		=	40	25
MCW-12	1015	1/6/2017		=	40	27
MCW-12	1015	1/7/2017		=	40	28
MCW-12	1015	1/8/2017		=	40	29
MCW-12	1015	1/9/2017		=	40	31
MCW-12	1000	1/10/2017 ♦	Rain		**Rain**	**Rain**
MCW-12	1000	1/11/2017	Rain		**Rain**	**Rain**
MCW-12	1000	1/12/2017	Rain		**Rain**	**Rain**
MCW-12	1000	1/13/2017	Rain		**Rain**	**Rain**
MCW-12	1000	1/14/2017	Rain		**Rain**	**Rain**
MCW-12	1000	1/15/2017	Rain		**Rain**	**Rain**
MCW-12	1000	1/16/2017	Rain		**Rain**	**Rain**
MCW-12	1000	1/17/2017 ♦		=	70	33
MCW-12	1000	1/18/2017		=	70	35
MCW-12	1000	1/19/2017		=	70	37
MCW-12	1000	1/20/2017		=	70	40
MCW-12	1000	1/21/2017		=	70	42
MCW-12	1000	1/22/2017		=	70	45
MCW-12	1000	1/23/2017		=	70	48
MCW-12	1100	1/24/2017 ♦	Rain		**Rain**	**Rain**
MCW-12	1100	1/25/2017	Rain		**Rain**	**Rain**
MCW-12	1100	1/26/2017	Rain		**Rain**	**Rain**
Single Sample (adjusted for rain, dry and NDs)					Geomean	



Location	Time	Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-12	1100	1/27/2017	Rain		**Rain**	**Rain**
MCW-12	1100	1/28/2017	Rain		**Rain**	**Rain**
MCW-12	1100	1/29/2017	Rain		**Rain**	**Rain**
MCW-12	1100	1/30/2017	Rain		**Rain**	**Rain**
MCW-12	815	1/31/2017 ♦		=	130	52
MCW-14b	1050	1/1/2017		=	140	121
MCW-14b	1050	1/2/2017		=	140	122
MCW-14b	930	1/3/2017 ♦		=	70	119
MCW-14b	930	1/4/2017		=	70	117
MCW-14b	930	1/5/2017		=	70	114
MCW-14b	930	1/6/2017		=	70	111
MCW-14b	930	1/7/2017		=	70	107
MCW-14b	930	1/8/2017		=	70	104
MCW-14b	930	1/9/2017		=	70	101
MCW-14b	915	1/10/2017 ♦	Rain		**Rain**	**Rain**
MCW-14b	915	1/11/2017	Rain		**Rain**	**Rain**
MCW-14b	915	1/12/2017	Rain		**Rain**	**Rain**
MCW-14b	915	1/13/2017	Rain		**Rain**	**Rain**
MCW-14b	915	1/14/2017	Rain		**Rain**	**Rain**
MCW-14b	915	1/15/2017	Rain		**Rain**	**Rain**
MCW-14b	915	1/16/2017	Rain		**Rain**	**Rain**
MCW-14b	1055	1/17/2017 ♦		=	20	94
MCW-14b	1055	1/18/2017		=	20	88
MCW-14b	1055	1/19/2017		=	20	81
MCW-14b	1055	1/20/2017		=	20	75
MCW-14b	1055	1/21/2017		=	20	69
MCW-14b	1055	1/22/2017		=	20	63
MCW-14b	1055	1/23/2017		=	20	58
MCW-14b	1020	1/24/2017 ♦	Rain		**Rain**	**Rain**
MCW-14b	1020	1/25/2017	Rain		**Rain**	**Rain**
MCW-14b	1020	1/26/2017	Rain		**Rain**	**Rain**
MCW-14b	1020	1/27/2017	Rain		**Rain**	**Rain**
MCW-14b	1020	1/28/2017	Rain		**Rain**	**Rain**
MCW-14b	1020	1/29/2017	Rain		**Rain**	**Rain**
MCW-14b	1020	1/30/2017	Rain		**Rain**	**Rain**
MCW-14b	945	1/31/2017 ♦		=	80	56
MCW-15c	1000	1/1/2017		=	80	87
MCW-15c	1000	1/2/2017		=	80	87
MCW-15c	900	1/3/2017 ♦		<	10	80
MCW-15c	900	1/4/2017		<	10	75
MCW-15c	900	1/5/2017		<	10	70
MCW-15c	900	1/6/2017		<	10	65
MCW-15c	900	1/7/2017		<	10	61
MCW-15c	900	1/8/2017		<	10	57
MCW-15c	900	1/9/2017		<	10	53



Location		Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	820	1/10/2017 ♦	Rain		**Rain**	**Rain**
MCW-15c	820	1/11/2017	Rain		**Rain**	**Rain**
MCW-15c	820	1/12/2017	Rain		**Rain**	**Rain**
MCW-15c	820	1/13/2017	Rain		**Rain**	**Rain**
MCW-15c	820	1/14/2017	Rain		**Rain**	**Rain**
MCW-15c	820	1/15/2017	Rain		**Rain**	**Rain**
MCW-15c	820	1/16/2017	Rain		**Rain**	**Rain**
MCW-15c	1140	1/17/2017 ♦		=	20	51
MCW-15c	1140	1/18/2017		=	20	48
MCW-15c	1140	1/19/2017		=	20	45
MCW-15c	1140	1/20/2017		=	20	41
MCW-15c	1140	1/21/2017		=	20	38
MCW-15c	1140	1/22/2017		=	20	35
MCW-15c	1140	1/23/2017		=	20	32
MCW-15c	940	1/24/2017 ♦	Rain		**Rain**	**Rain**
MCW-15c	940	1/25/2017	Rain		**Rain**	**Rain**
MCW-15c	940	1/26/2017	Rain		**Rain**	**Rain**
MCW-15c	940	1/27/2017	Rain		**Rain**	**Rain**
MCW-15c	940	1/28/2017	Rain		**Rain**	**Rain**
MCW-15c	940	1/29/2017	Rain		**Rain**	**Rain**
MCW-15c	940	1/30/2017	Rain		**Rain**	**Rain**
MCW-15c	1035	1/31/2017 ♦		=	20	30
MCW-17	-	1/1/2017	Dry	<	10	10
MCW-17	-	1/2/2017	Dry	<	10	10
MCW-17	-	1/3/2017 ♦	Dry	<	10	10
MCW-17	-	1/4/2017	Dry	<	10	10
MCW-17	-	1/5/2017	Dry	<	10	10
MCW-17	-	1/6/2017	Dry	<	10	10
MCW-17	-	1/7/2017	Dry	<	10	10
MCW-17	-	1/8/2017	Dry	<	10	10
MCW-17	-	1/9/2017	Dry	<	10	10
MCW-17	-	1/10/2017 ♦	Rain		**Rain**	**Rain**
MCW-17	-	1/11/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/12/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/13/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/14/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/15/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/16/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/17/2017 ♦	Dry	<	10	10
MCW-17	-	1/18/2017	Dry	<	10	10
MCW-17	-	1/19/2017	Dry	<	10	10
MCW-17	-	1/20/2017	Dry	<	10	10
MCW-17	-	1/21/2017	Dry	<	10	10
MCW-17	-	1/22/2017	Dry	<	10	10
MCW-17	-	1/23/2017	Dry	<	10	10
MCW-17	-	1/24/2017 ♦	Rain		**Rain**	**Rain**



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-17	-	1/25/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/26/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/27/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/28/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/29/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/30/2017	Rain		**Rain**	**Rain**
MCW-17	-	1/31/2017 ♦	Dry	<	10	10
MCW-18	-	1/1/2017	Dry	<	10	10
MCW-18	-	1/2/2017	Dry	<	10	10
MCW-18	-	1/3/2017 ♦	Dry	<	10	10
MCW-18	-	1/4/2017	Dry	<	10	10
MCW-18	-	1/5/2017	Dry	<	10	10
MCW-18	-	1/6/2017	Dry	<	10	10
MCW-18	-	1/7/2017	Dry	<	10	10
MCW-18	-	1/8/2017	Dry	<	10	10
MCW-18	-	1/9/2017	Dry	<	10	10
MCW-18	-	1/10/2017 ♦	Rain		**Rain**	**Rain**
MCW-18	-	1/11/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/12/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/13/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/14/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/15/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/16/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/17/2017 ♦	Dry	<	10	10
MCW-18	-	1/18/2017	Dry	<	10	10
MCW-18	-	1/19/2017	Dry	<	10	10
MCW-18	-	1/20/2017	Dry	<	10	10
MCW-18	-	1/21/2017	Dry	<	10	10
MCW-18	-	1/22/2017	Dry	<	10	10
MCW-18	-	1/23/2017	Dry	<	10	10
MCW-18	-	1/24/2017 ♦	Rain		**Rain**	**Rain**
MCW-18	-	1/25/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/26/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/27/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/28/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/29/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/30/2017	Rain		**Rain**	**Rain**
MCW-18	-	1/31/2017 ♦	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



March 20, 2017

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Cosio, Director

Engineering Services Department
Christopher E. Cooper, Director

Transportation Department
David L. Fleisch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Glenn Shephard, Director

**Subject: Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring For
Ventura County and City Of Thousand Oaks**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of February 2017. Sites were sampled weekly on Tuesdays (February 7, 14, 24 and 28). Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm
Deputy Director, Watershed Protection District

CC: Glenn Shephard, Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	1240	2/7/2017 ♦	Rain	<	20
MCW-8b	1135	2/14/2017 ♦		=	70
MCW-8b	1200	2/21/2017 ♦	Rain	=	110
MCW-8b	1130	2/28/2017 ♦	Rain	<	20
MCW-9	-	2/7/2017 ♦	Rain		Dry
MCW-9	-	2/14/2017 ♦			Dry
MCW-9	-	2/21/2017 ♦	Rain		Dry
MCW-9	-	2/28/2017 ♦	Rain		Dry
MCW-12	1200	2/7/2017 ♦	Rain	=	170
MCW-12	1200	2/14/2017 ♦		=	80
MCW-12	1115	2/21/2017 ♦	Rain	=	300
MCW-12	1000	2/28/2017 ♦	Rain	=	130
MCW-14b	1130	2/7/2017 ♦	Rain	=	1700
MCW-14b	815	2/14/2017 ♦		<	20
MCW-14b	1040	2/21/2017 ♦	Rain	=	1300
MCW-14b	915	2/28/2017 ♦	Rain	=	300
MCW-15c	1050	2/7/2017 ♦	Rain	=	1700
MCW-15c	815	2/14/2017 ♦		<	20
MCW-15c	1000	2/21/2017 ♦	Rain	=	1300
MCW-15c	835	2/28/2017 ♦	Rain	=	130
MCW-17	1000	2/7/2017 ♦	Rain	=	80
MCW-17	700	2/14/2017 ♦		=	20
MCW-17	915	2/21/2017 ♦	Rain	=	500
MCW-17	800	2/28/2017 ♦	Rain	<	20
MCW-18	-	2/7/2017 ♦	Rain		Dry
MCW-18	-	2/14/2017 ♦			Dry
MCW-18	-	2/21/2017 ♦	Rain		Dry
MCW-18	-	2/28/2017 ♦	Rain		Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-8b	900	2/1/2017		=	70	11
MCW-8b	900	2/2/2017		=	70	12
MCW-8b	900	2/3/2017		=	70	13
MCW-8b	900	2/4/2017		=	70	14
MCW-8b	900	2/5/2017		=	70	15
MCW-8b	900	2/6/2017		=	70	16
MCW-8b	1240	2/7/2017 ♦	Rain		**Rain**	**Rain**
MCW-8b	1240	2/8/2017	Rain		**Rain**	**Rain**
MCW-8b	1240	2/9/2017	Rain		**Rain**	**Rain**
MCW-8b	1240	2/10/2017	Rain		**Rain**	**Rain**
MCW-8b	1240	2/11/2017	Rain		**Rain**	**Rain**
MCW-8b	1240	2/12/2017	Rain		**Rain**	**Rain**
MCW-8b	1240	2/13/2017	Rain		**Rain**	**Rain**
MCW-8b	1135	2/14/2017 ♦		=	70	17
MCW-8b	1135	2/15/2017		=	70	18
MCW-8b	1135	2/16/2017		=	70	19
MCW-8b	1135	2/17/2017		=	70	20
MCW-8b	1135	2/18/2017		=	70	22
MCW-8b	1135	2/19/2017		=	70	23
MCW-8b	1135	2/20/2017		=	70	25
MCW-8b	1200	2/21/2017 ♦	Rain		**Rain**	**Rain**
MCW-8b	1200	2/22/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	2/23/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	2/24/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	2/25/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	2/26/2017	Rain		**Rain**	**Rain**
MCW-8b	1200	2/27/2017	Rain		**Rain**	**Rain**
MCW-8b	1130	2/28/2017 ♦	Rain		**Rain**	**Rain**
MCW-9	-	2/1/2017	Dry	<	10	10
MCW-9	-	2/2/2017	Dry	<	10	10
MCW-9	-	2/3/2017	Dry	<	10	10
MCW-9	-	2/4/2017	Dry	<	10	10
MCW-9	-	2/5/2017	Dry	<	10	10
MCW-9	-	2/6/2017	Dry	<	10	10
MCW-9	-	2/7/2017 ♦	Dry	<	10	10
MCW-9	-	2/8/2017	Dry	<	10	10
MCW-9	-	2/9/2017	Dry	<	10	10
MCW-9	-	2/10/2017	Dry	<	10	10
MCW-9	-	2/11/2017	Dry	<	10	10
MCW-9	-	2/12/2017	Dry	<	10	10
MCW-9	-	2/13/2017	Dry	<	10	10
MCW-9	-	2/14/2017 ♦	Dry	<	10	10
MCW-9	-	2/15/2017	Dry	<	10	10
MCW-9	-	2/16/2017	Dry	<	10	10



Location	Time	Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-9	-	2/17/2017	Dry	<	10	10
MCW-9	-	2/18/2017	Dry	<	10	10
MCW-9	-	2/19/2017	Dry	<	10	10
MCW-9	-	2/20/2017	Dry	<	10	10
MCW-9	-	2/21/2017 ♦	Dry	<	10	10
MCW-9	-	2/22/2017	Dry	<	10	10
MCW-9	-	2/23/2017	Dry	<	10	10
MCW-9	-	2/24/2017	Dry	<	10	10
MCW-9	-	2/25/2017	Dry	<	10	10
MCW-9	-	2/26/2017	Dry	<	10	10
MCW-9	-	2/27/2017	Dry	<	10	10
MCW-9	-	2/28/2017 ♦	Dry	<	10	10
MCW-12	815	2/1/2017		=	130	57
MCW-12	815	2/2/2017		=	130	62
MCW-12	815	2/3/2017		=	130	68
MCW-12	815	2/4/2017		=	130	74
MCW-12	815	2/5/2017		=	130	80
MCW-12	815	2/6/2017		=	130	88
MCW-12	1200	2/7/2017 ♦	Rain		**Rain**	**Rain**
MCW-12	1200	2/8/2017	Rain		**Rain**	**Rain**
MCW-12	1200	2/9/2017	Rain		**Rain**	**Rain**
MCW-12	1200	2/10/2017	Rain		**Rain**	**Rain**
MCW-12	1200	2/11/2017	Rain		**Rain**	**Rain**
MCW-12	1200	2/12/2017	Rain		**Rain**	**Rain**
MCW-12	1200	2/13/2017	Rain		**Rain**	**Rain**
MCW-12	1200	2/14/2017 ♦		=	80	94
MCW-12	1200	2/15/2017		=	80	101
MCW-12	1200	2/16/2017		=	80	96
MCW-12	1200	2/17/2017		=	80	92
MCW-12	1200	2/18/2017		=	80	88
MCW-12	1200	2/19/2017		=	80	84
MCW-12	1200	2/20/2017		=	80	81
MCW-12	1115	2/21/2017 ♦	Rain		**Rain**	**Rain**
MCW-12	1115	2/22/2017	Rain		**Rain**	**Rain**
MCW-12	1115	2/23/2017	Rain		**Rain**	**Rain**
MCW-12	1115	2/24/2017	Rain		**Rain**	**Rain**
MCW-12	1115	2/25/2017	Rain		**Rain**	**Rain**
MCW-12	1115	2/26/2017	Rain		**Rain**	**Rain**
MCW-12	1115	2/27/2017	Rain		**Rain**	**Rain**
MCW-12	1000	2/28/2017 ♦	Rain		**Rain**	**Rain**
MCW-14b	945	2/1/2017		=	80	54
MCW-14b	945	2/2/2017		=	80	56
MCW-14b	945	2/3/2017		=	80	57
MCW-14b	945	2/4/2017		=	80	58



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-14b	945	2/5/2017		=	80	60
MCW-14b	945	2/6/2017		=	80	61
MCW-14b	1130	2/7/2017 ♦			**Rain**	**Rain**
MCW-14b	1130	2/8/2017			**Rain**	**Rain**
MCW-14b	1130	2/9/2017			**Rain**	**Rain**
MCW-14b	1130	2/10/2017			**Rain**	**Rain**
MCW-14b	1130	2/11/2017			**Rain**	**Rain**
MCW-14b	1130	2/12/2017			**Rain**	**Rain**
MCW-14b	1130	2/13/2017			**Rain**	**Rain**
MCW-14b	815	2/14/2017 ♦		<	10	58
MCW-14b	815	2/15/2017		<	10	56
MCW-14b	815	2/16/2017		<	10	51
MCW-14b	815	2/17/2017		<	10	47
MCW-14b	815	2/18/2017		<	10	43
MCW-14b	815	2/19/2017		<	10	39
MCW-14b	815	2/20/2017		<	10	36
MCW-14b	1040	2/21/2017 ♦			**Rain**	**Rain**
MCW-14b	1040	2/22/2017			**Rain**	**Rain**
MCW-14b	1040	2/23/2017			**Rain**	**Rain**
MCW-14b	1040	2/24/2017			**Rain**	**Rain**
MCW-14b	1040	2/25/2017			**Rain**	**Rain**
MCW-14b	1040	2/26/2017			**Rain**	**Rain**
MCW-14b	1040	2/27/2017			**Rain**	**Rain**
MCW-14b	915	2/28/2017 ♦			**Rain**	**Rain**
MCW-15c	1035	2/1/2017		=	20	28
MCW-15c	1035	2/2/2017		=	20	27
MCW-15c	1035	2/3/2017		=	20	26
MCW-15c	1035	2/4/2017		=	20	26
MCW-15c	1035	2/5/2017		=	20	25
MCW-15c	1035	2/6/2017		=	20	25
MCW-15c	1050	2/7/2017 ♦	Rain		**Rain**	**Rain**
MCW-15c	1050	2/8/2017	Rain		**Rain**	**Rain**
MCW-15c	1050	2/9/2017	Rain		**Rain**	**Rain**
MCW-15c	1050	2/10/2017	Rain		**Rain**	**Rain**
MCW-15c	1050	2/11/2017	Rain		**Rain**	**Rain**
MCW-15c	1050	2/12/2017	Rain		**Rain**	**Rain**
MCW-15c	1050	2/13/2017	Rain		**Rain**	**Rain**
MCW-15c	815	2/14/2017 ♦		<	10	24
MCW-15c	815	2/15/2017		<	10	22
MCW-15c	815	2/16/2017		<	10	21
MCW-15c	815	2/17/2017		<	10	20
MCW-15c	815	2/18/2017		<	10	18
MCW-15c	815	2/19/2017		<	10	17
MCW-15c	815	2/20/2017		<	10	16
MCW-15c	1000	2/21/2017 ♦	Rain		**Rain**	**Rain**



Location		Date	Rain		Single Sample (adjusted for rain, dry and NDs)	Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	1000	2/22/2017	Rain		**Rain**	**Rain**
MCW-15c	1000	2/23/2017	Rain		**Rain**	**Rain**
MCW-15c	1000	2/24/2017	Rain		**Rain**	**Rain**
MCW-15c	1000	2/25/2017	Rain		**Rain**	**Rain**
MCW-15c	1000	2/26/2017	Rain		**Rain**	**Rain**
MCW-15c	1000	2/27/2017	Rain		**Rain**	**Rain**
MCW-15c	835	2/28/2017 ♦	Rain		**Rain**	**Rain**
MCW-17	1110	2/1/2017		<	10	10
MCW-17	1110	2/2/2017		<	10	10
MCW-17	1110	2/3/2017		<	10	10
MCW-17	1110	2/4/2017		<	10	10
MCW-17	1110	2/5/2017		<	10	10
MCW-17	1110	2/6/2017		<	10	10
MCW-17	1000	2/7/2017 ♦	Rain		**Rain**	**Rain**
MCW-17	1000	2/8/2017	Rain		**Rain**	**Rain**
MCW-17	1000	2/9/2017	Rain		**Rain**	**Rain**
MCW-17	1000	2/10/2017	Rain		**Rain**	**Rain**
MCW-17	1000	2/11/2017	Rain		**Rain**	**Rain**
MCW-17	1000	2/12/2017	Rain		**Rain**	**Rain**
MCW-17	1000	2/13/2017	Rain		**Rain**	**Rain**
MCW-17	700	2/14/2017 ♦		=	20	10
MCW-17	700	2/15/2017		=	20	10
MCW-17	700	2/16/2017		=	20	11
MCW-17	700	2/17/2017		=	20	11
MCW-17	700	2/18/2017		=	20	11
MCW-17	700	2/19/2017		=	20	11
MCW-17	700	2/20/2017		=	20	12
MCW-17	915	2/21/2017 ♦	Rain		**Rain**	**Rain**
MCW-17	915	2/22/2017	Rain		**Rain**	**Rain**
MCW-17	915	2/23/2017	Rain		**Rain**	**Rain**
MCW-17	915	2/24/2017	Rain		**Rain**	**Rain**
MCW-17	915	2/25/2017	Rain		**Rain**	**Rain**
MCW-17	915	2/26/2017	Rain		**Rain**	**Rain**
MCW-17	915	2/27/2017	Rain		**Rain**	**Rain**
MCW-17	800	2/28/2017 ♦	Rain		**Rain**	**Rain**
MCW-18	-	2/1/2017	Dry	<	10	10
MCW-18	-	2/2/2017	Dry	<	10	10
MCW-18	-	2/3/2017	Dry	<	10	10
MCW-18	-	2/4/2017	Dry	<	10	10
MCW-18	-	2/5/2017	Dry	<	10	10
MCW-18	-	2/6/2017	Dry	<	10	10
MCW-18	-	2/7/2017 ♦	Dry	<	10	10
MCW-18	-	2/8/2017	Dry	<	10	10
MCW-18	-	2/9/2017	Dry	<	10	10
MCW-18	-	2/10/2017	Dry	<	10	10
MCW-18	-	2/11/2017	Dry	<	10	10



[illegible]

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with $>0.1''$ rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL ($=10$) in the calculation of the geometric mean.

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



May 19, 2017

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Cosio, Director

Engineering Services Department
Christopher E. Cooper, Director

Transportation Department
David L. Fleisch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Glenn Shephard, Director

**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND
OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of April 2017. Sites were sampled weekly on Tuesdays (April 4, 11, 18 and 25). Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm
Deputy Director, Watershed Protection District

CC: Glenn Shephard, Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	1125	4/4/2017 ♦		=	230
MCW-8b	1230	4/11/2017 ♦		<	20
MCW-8b	1215	4/18/2017 ♦		<	20
MCW-8b	1245	4/25/2017 ♦		=	170
MCW-9	-	4/4/2017 ♦			Dry
MCW-9	-	4/11/2017 ♦			Dry
MCW-9	-	4/18/2017 ♦			Dry
MCW-9	-	4/25/2017 ♦			Dry
MCW-12	1040	4/4/2017 ♦		=	170
MCW-12	1130	4/11/2017 ♦		<	20
MCW-12	1125	4/18/2017 ♦		<	20
MCW-12	1140	4/25/2017 ♦		=	80
MCW-14b	1000	4/4/2017 ♦		=	130
MCW-14b	1050	4/11/2017 ♦		<	20
MCW-14b	1100	4/18/2017 ♦		=	500
MCW-14b	1050	4/25/2017 ♦		=	130
MCW-15c	925	4/4/2017 ♦		<	20
MCW-15c	1015	4/11/2017 ♦		<	20
MCW-15c	1035	4/18/2017 ♦		=	130
MCW-15c	1000	4/25/2017 ♦		=	230
MCW-17	845	4/4/2017 ♦		=	40
MCW-17	940	4/11/2017 ♦		=	40
MCW-17	1015	4/18/2017 ♦		=	130
MCW-17	915	4/25/2017 ♦		=	300
MCW-18	-	4/4/2017 ♦			Dry
MCW-18	-	4/11/2017 ♦			Dry
MCW-18	-	4/18/2017 ♦			Dry
MCW-18	-	4/25/2017 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	1125	4/4/2017 ♦		=	230
MCW-8b	1230	4/11/2017 ♦		<	20
MCW-8b	1215	4/18/2017 ♦		<	20
MCW-8b	1245	4/25/2017 ♦		=	170
MCW-9	-	4/4/2017 ♦			Dry
MCW-9	-	4/11/2017 ♦			Dry
MCW-9	-	4/18/2017 ♦			Dry
MCW-9	-	4/25/2017 ♦			Dry
MCW-12	1040	4/4/2017 ♦		=	170
MCW-12	1130	4/11/2017 ♦		<	20
MCW-12	1125	4/18/2017 ♦		<	20
MCW-12	1140	4/25/2017 ♦		=	80
MCW-14b	1000	4/4/2017 ♦		=	130
MCW-14b	1050	4/11/2017 ♦		<	20
MCW-14b	1100	4/18/2017 ♦		=	500
MCW-14b	1050	4/25/2017 ♦		=	130
MCW-15c	925	4/4/2017 ♦		<	20
MCW-15c	1015	4/11/2017 ♦		<	20
MCW-15c	1035	4/18/2017 ♦		=	130
MCW-15c	1000	4/25/2017 ♦		=	230
MCW-17	845	4/4/2017 ♦		=	40
MCW-17	940	4/11/2017 ♦		=	40
MCW-17	1015	4/18/2017 ♦		=	130
MCW-17	915	4/25/2017 ♦		=	300
MCW-18	-	4/4/2017 ♦			Dry
MCW-18	-	4/11/2017 ♦			Dry
MCW-18	-	4/18/2017 ♦			Dry
MCW-18	-	4/25/2017 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-8b	1155	4/1/2017		<	10	19
MCW-8b	1155	4/2/2017		<	10	18
MCW-8b	1155	4/3/2017		<	10	17
MCW-8b	1125	4/4/2017 ♦		=	230	17
MCW-8b	1125	4/5/2017		=	230	18
MCW-8b	1125	4/6/2017		=	230	19
MCW-8b	1125	4/7/2017		=	230	21
MCW-8b	1125	4/8/2017		=	230	23
MCW-8b	1125	4/9/2017		=	230	26
MCW-8b	1125	4/10/2017		=	230	29
MCW-8b	1230	4/11/2017 ♦		<	10	29
MCW-8b	1230	4/12/2017		<	10	29
MCW-8b	1230	4/13/2017		<	10	29
MCW-8b	1230	4/14/2017		<	10	29
MCW-8b	1230	4/15/2017		<	10	29
MCW-8b	1230	4/16/2017		<	10	29
MCW-8b	1230	4/17/2017		<	10	29
MCW-8b	1215	4/18/2017 ♦		<	10	29
MCW-8b	1215	4/19/2017		<	10	29
MCW-8b	1215	4/20/2017		<	10	27
MCW-8b	1215	4/21/2017		<	10	26
MCW-8b	1215	4/22/2017		<	10	25
MCW-8b	1215	4/23/2017		<	10	24
MCW-8b	1215	4/24/2017		<	10	23
MCW-8b	1245	4/25/2017 ♦		=	170	24
MCW-8b	1245	4/26/2017		=	170	25
MCW-8b	1245	4/27/2017		=	170	28
MCW-8b	1245	4/28/2017		=	170	30
MCW-8b	1245	4/29/2017		=	170	33
MCW-8b	1245	4/30/2017		=	170	37
MCW-9	-	4/1/2017	Dry	<	10	10
MCW-9	-	4/2/2017	Dry	<	10	10
MCW-9	-	4/3/2017	Dry	<	10	10
MCW-9	-	4/4/2017 ♦	Dry	<	10	10
MCW-9	-	4/5/2017	Dry	<	10	10
MCW-9	-	4/6/2017	Dry	<	10	10
MCW-9	-	4/7/2017	Dry	<	10	10
MCW-9	-	4/8/2017	Dry	<	10	10
MCW-9	-	4/9/2017	Dry	<	10	10
MCW-9	-	4/10/2017	Dry	<	10	10
MCW-9	-	4/11/2017 ♦	Dry	<	10	10
MCW-9	-	4/12/2017	Dry	<	10	10
MCW-9	-	4/13/2017	Dry	<	10	10
MCW-9	-	4/14/2017	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-9	-	4/15/2017	Dry	<	10	10
MCW-9	-	4/16/2017	Dry	<	10	10
MCW-9	-	4/17/2017	Dry	<	10	10
MCW-9	-	4/18/2017 ♦	Dry	<	10	10
MCW-9	-	4/19/2017	Dry	<	10	10
MCW-9	-	4/20/2017	Dry	<	10	10
MCW-9	-	4/21/2017	Dry	<	10	10
MCW-9	-	4/22/2017	Dry	<	10	10
MCW-9	-	4/23/2017	Dry	<	10	10
MCW-9	-	4/24/2017	Dry	<	10	10
MCW-9	-	4/25/2017 ♦	Dry	<	10	10
MCW-9	-	4/26/2017	Dry	<	10	10
MCW-9	-	4/27/2017	Dry	<	10	10
MCW-9	-	4/28/2017	Dry	<	10	10
MCW-9	-	4/29/2017	Dry	<	10	10
MCW-9	-	4/30/2017	Dry	<	10	10
MCW-12	1100	4/1/2017		=	110	29
MCW-12	1100	4/2/2017		=	110	29
MCW-12	1100	4/3/2017		=	110	30
MCW-12	1040	4/4/2017 ♦		=	170	31
MCW-12	1040	4/5/2017		=	170	31
MCW-12	1040	4/6/2017		=	170	32
MCW-12	1040	4/7/2017		=	170	35
MCW-12	1040	4/8/2017		=	170	39
MCW-12	1040	4/9/2017		=	170	43
MCW-12	1040	4/10/2017		=	170	47
MCW-12	1130	4/11/2017 ♦		<	10	47
MCW-12	1130	4/12/2017		<	10	47
MCW-12	1130	4/13/2017		<	10	47
MCW-12	1130	4/14/2017		<	10	47
MCW-12	1130	4/15/2017		<	10	47
MCW-12	1130	4/16/2017		<	10	47
MCW-12	1130	4/17/2017		<	10	47
MCW-12	1125	4/18/2017 ♦		<	10	47
MCW-12	1125	4/19/2017		<	10	47
MCW-12	1125	4/20/2017		<	10	45
MCW-12	1125	4/21/2017		<	10	43
MCW-12	1125	4/22/2017		<	10	41
MCW-12	1125	4/23/2017		<	10	39
MCW-12	1125	4/24/2017		<	10	37
MCW-12	1140	4/25/2017 ♦		=	80	38
MCW-12	1140	4/26/2017		=	80	39
MCW-12	1140	4/27/2017		=	80	39
MCW-12	1140	4/28/2017		=	80	38



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-12	1140	4/29/2017		=	80	38
MCW-12	1140	4/30/2017		=	80	37
MCW-14b	1035	4/1/2017		=	170	40
MCW-14b	1035	4/2/2017		=	170	44
MCW-14b	1035	4/3/2017		=	170	48
MCW-14b	1000	4/4/2017 ♦		=	130	53
MCW-14b	1000	4/5/2017		=	130	57
MCW-14b	1000	4/6/2017		=	130	62
MCW-14b	1000	4/7/2017		=	130	68
MCW-14b	1000	4/8/2017		=	130	74
MCW-14b	1000	4/9/2017		=	130	81
MCW-14b	1000	4/10/2017		=	130	88
MCW-14b	1050	4/11/2017 ♦		<	10	88
MCW-14b	1050	4/12/2017		<	10	88
MCW-14b	1050	4/13/2017		<	10	88
MCW-14b	1050	4/14/2017		<	10	88
MCW-14b	1050	4/15/2017		<	10	88
MCW-14b	1050	4/16/2017		<	10	88
MCW-14b	1050	4/17/2017		<	10	88
MCW-14b	1100	4/18/2017 ♦		=	500	100
MCW-14b	1100	4/19/2017		=	500	114
MCW-14b	1100	4/20/2017		=	500	114
MCW-14b	1100	4/21/2017		=	500	114
MCW-14b	1100	4/22/2017		=	500	114
MCW-14b	1100	4/23/2017		=	500	114
MCW-14b	1100	4/24/2017		=	500	114
MCW-14b	1050	4/25/2017 ♦		=	130	109
MCW-14b	1050	4/26/2017		=	130	104
MCW-14b	1050	4/27/2017		=	130	103
MCW-14b	1050	4/28/2017		=	130	102
MCW-14b	1050	4/29/2017		=	130	101
MCW-14b	1050	4/30/2017		=	130	101
MCW-15c	955	4/1/2017		=	210	43
MCW-15c	955	4/2/2017		=	210	48
MCW-15c	955	4/3/2017		=	210	53
MCW-15c	925	4/4/2017 ♦		<	10	53
MCW-15c	925	4/5/2017		<	10	53
MCW-15c	925	4/6/2017		<	10	53
MCW-15c	925	4/7/2017		<	10	53
MCW-15c	925	4/8/2017		<	10	53
MCW-15c	925	4/9/2017		<	10	53
MCW-15c	925	4/10/2017		<	10	53
MCW-15c	1015	4/11/2017 ♦		<	10	53
MCW-15c	1015	4/12/2017		<	10	53
MCW-15c	1015	4/13/2017		<	10	52



				Single Sample (adjusted for rain, dry and NDs)		Geomean
Location		Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	1015	4/14/2017		<	10	51
MCW-15c	1015	4/15/2017		<	10	49
MCW-15c	1015	4/16/2017		<	10	48
MCW-15c	1015	4/17/2017		<	10	47
MCW-15c	1035	4/18/2017 ♦		=	130	50
MCW-15c	1035	4/19/2017		=	130	53
MCW-15c	1035	4/20/2017		=	130	52
MCW-15c	1035	4/21/2017		=	130	50
MCW-15c	1035	4/22/2017		=	130	49
MCW-15c	1035	4/23/2017		=	130	48
MCW-15c	1035	4/24/2017		=	130	46
MCW-15c	1000	4/25/2017 ♦		=	230	46
MCW-15c	1000	4/26/2017		=	230	46
MCW-15c	1000	4/27/2017		=	230	46
MCW-15c	1000	4/28/2017		=	230	46
MCW-15c	1000	4/29/2017		=	230	46
MCW-15c	1000	4/30/2017		=	230	46
MCW-17	915	4/1/2017		=	70	40
MCW-17	915	4/2/2017		=	70	42
MCW-17	915	4/3/2017		=	70	44
MCW-17	845	4/4/2017 ♦		=	40	45
MCW-17	845	4/5/2017		=	40	46
MCW-17	845	4/6/2017		=	40	47
MCW-17	845	4/7/2017		=	40	49
MCW-17	845	4/8/2017		=	40	52
MCW-17	845	4/9/2017		=	40	54
MCW-17	845	4/10/2017		=	40	57
MCW-17	940	4/11/2017 ♦		=	40	59
MCW-17	940	4/12/2017		=	40	62
MCW-17	940	4/13/2017		=	40	63
MCW-17	940	4/14/2017		=	40	65
MCW-17	940	4/15/2017		=	40	66
MCW-17	940	4/16/2017		=	40	68
MCW-17	940	4/17/2017		=	40	70
MCW-17	1015	4/18/2017 ♦		=	130	74
MCW-17	1015	4/19/2017		=	130	79
MCW-17	1015	4/20/2017		=	130	77
MCW-17	1015	4/21/2017		=	130	75
MCW-17	1015	4/22/2017		=	130	73
MCW-17	1015	4/23/2017		=	130	71
MCW-17	1015	4/24/2017		=	130	69
MCW-17	915	4/25/2017 ♦		=	300	69
MCW-17	915	4/26/2017		=	300	69
MCW-17	915	4/27/2017		=	300	72
MCW-17	915	4/28/2017		=	300	76
MCW-17	915	4/29/2017		=	300	79



[illegible]

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with $>0.1''$ rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL ($=10$) in the calculation of the geometric mean.

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

◆ Date of sampling



June 26, 2017

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

Central Services Department
J. Tabin Cosio, Director

Engineering Services Department
Christopher E. Cooper, Director

Transportation Department
David L. Fleisch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Glenn Shephard, Director

**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of May 2017. Sites were sampled weekly on Tuesdays (May 2, 9, 16 and 30), except for one instance when sites were sampled Wednesday (May 24) due to staffing conflicts. Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,



Arne Anselm

Deputy Director, Watershed Protection District

CC: Glenn Shephard, Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	1215	5/2/2017 ♦		=	20
MCW-8b	1215	5/9/2017 ♦		=	500
MCW-8b	1245	5/16/2017 ♦		=	130
MCW-8b	1245	5/24/2017 ♦		=	16,000
MCW-8b	1240	5/30/2017 ♦		=	40
MCW-9	-	5/2/2017 ♦			Dry
MCW-9	-	5/9/2017 ♦			Dry
MCW-9	-	5/16/2017 ♦			Dry
MCW-9	-	5/24/2017 ♦			Dry
MCW-9	-	5/30/2017 ♦			Dry
MCW-12	1115	5/2/2017 ♦		=	170
MCW-12	1100	5/9/2017 ♦		=	300
MCW-12	1125	5/16/2017 ♦		=	20
MCW-12	1130	5/24/2017 ♦		=	16,000
MCW-12	1000	5/30/2017 ♦		=	40
MCW-14b	1035	5/2/2017 ♦		=	45
MCW-14b	1135	5/9/2017 ♦		=	230
MCW-14b	1040	5/16/2017 ♦		=	20
MCW-14b	1040	5/24/2017 ♦		=	340
MCW-14b	1040	5/30/2017 ♦		=	20
MCW-15c	1000	5/2/2017 ♦		=	45
MCW-15c	1015	5/9/2017 ♦		=	130
MCW-15c	1015	5/16/2017 ♦		=	230
MCW-15c	955	5/24/2017 ♦		=	790
MCW-15c	1000	5/30/2017 ♦		=	40
MCW-17	930	5/2/2017 ♦		=	20
MCW-17	930	5/9/2017 ♦		=	140
MCW-17	930	5/16/2017 ♦		=	230
MCW-17	915	5/24/2017 ♦		=	700
MCW-17	920	5/30/2017 ♦		=	800
MCW-18	-	5/2/2017 ♦			Dry
MCW-18	-	5/9/2017 ♦			Dry
MCW-18	-	5/16/2017 ♦			Dry
MCW-18	-	5/24/2017 ♦			Dry
MCW-18	-	5/30/2017 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-8b	1245	5/1/2017		=	170	40
MCW-8b	1215	5/2/2017 ♦		=	20	41
MCW-8b	1215	5/3/2017		=	20	42
MCW-8b	1215	5/4/2017		=	20	39
MCW-8b	1215	5/5/2017		=	20	36
MCW-8b	1215	5/6/2017		=	20	33
MCW-8b	1215	5/7/2017		=	20	30
MCW-8b	1215	5/8/2017		=	20	28
MCW-8b	1215	5/9/2017 ♦		=	500	29
MCW-8b	1215	5/10/2017		=	500	30
MCW-8b	1215	5/11/2017		=	500	34
MCW-8b	1215	5/12/2017		=	500	38
MCW-8b	1215	5/13/2017		=	500	44
MCW-8b	1215	5/14/2017		=	500	50
MCW-8b	1215	5/15/2017		=	500	57
MCW-8b	1245	5/16/2017 ♦		=	130	62
MCW-8b	1245	5/17/2017		=	130	67
MCW-8b	1245	5/18/2017		=	130	73
MCW-8b	1245	5/19/2017		=	130	80
MCW-8b	1245	5/20/2017		=	130	87
MCW-8b	1245	5/21/2017		=	130	95
MCW-8b	1245	5/22/2017		=	130	103
MCW-8b	1245	5/23/2017		=	130	112
MCW-8b	1245	5/24/2017 ♦		=	16,000	144
MCW-8b	1245	5/25/2017		=	16,000	167
MCW-8b	1245	5/26/2017		=	16,000	195
MCW-8b	1245	5/27/2017		=	16,000	226
MCW-8b	1245	5/28/2017		=	16,000	264
MCW-8b	1245	5/29/2017		=	16,000	307
MCW-8b	1240	5/30/2017 ♦		=	40	292
MCW-8b	1240	5/31/2017		=	40	278
MCW-9	-	5/1/2017	Dry	<	10	10
MCW-9	-	5/2/2017 ♦	Dry	<	10	10
MCW-9	-	5/3/2017	Dry	<	10	10
MCW-9	-	5/4/2017	Dry	<	10	10
MCW-9	-	5/5/2017	Dry	<	10	10
MCW-9	-	5/6/2017	Dry	<	10	10
MCW-9	-	5/7/2017	Dry	<	10	10
MCW-9	-	5/8/2017	Dry	<	10	10
MCW-9	-	5/9/2017 ♦	Dry	<	10	10
MCW-9	-	5/10/2017	Dry	<	10	10
MCW-9	-	5/11/2017	Dry	<	10	10
MCW-9	-	5/12/2017	Dry	<	10	10
MCW-9	-	5/13/2017	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-9	-	5/14/2017	Dry	<	10	10
MCW-9	-	5/15/2017	Dry	<	10	10
MCW-9	-	5/16/2017 ♦	Dry	<	10	10
MCW-9	-	5/17/2017	Dry	<	10	10
MCW-9	-	5/18/2017	Dry	<	10	10
MCW-9	-	5/19/2017	Dry	<	10	10
MCW-9	-	5/20/2017	Dry	<	10	10
MCW-9	-	5/21/2017	Dry	<	10	10
MCW-9	-	5/22/2017	Dry	<	10	10
MCW-9	-	5/23/2017	Dry	<	10	10
MCW-9	-	5/24/2017 ♦	Dry	<	10	10
MCW-9	-	5/25/2017	Dry	<	10	10
MCW-9	-	5/26/2017	Dry	<	10	10
MCW-9	-	5/27/2017	Dry	<	10	10
MCW-9	-	5/28/2017	Dry	<	10	10
MCW-9	-	5/29/2017	Dry	<	10	10
MCW-9	-	5/30/2017 ♦	Dry	<	10	10
MCW-9	-	5/31/2017	Dry	<	10	10
MCW-12	1140	5/1/2017		=	80	37
MCW-12	1115	5/2/2017 ♦		=	170	37
MCW-12	1115	5/3/2017		=	170	38
MCW-12	1115	5/4/2017		=	170	38
MCW-12	1115	5/5/2017		=	170	38
MCW-12	1115	5/6/2017		=	170	38
MCW-12	1115	5/7/2017		=	170	38
MCW-12	1115	5/8/2017		=	170	38
MCW-12	1100	5/9/2017 ♦		=	300	39
MCW-12	1100	5/10/2017		=	300	39
MCW-12	1100	5/11/2017		=	300	44
MCW-12	1100	5/12/2017		=	300	50
MCW-12	1100	5/13/2017		=	300	55
MCW-12	1100	5/14/2017		=	300	62
MCW-12	1100	5/15/2017		=	300	70
MCW-12	1125	5/16/2017 ♦		=	20	71
MCW-12	1125	5/17/2017		=	20	73
MCW-12	1125	5/18/2017		=	20	75
MCW-12	1125	5/19/2017		=	20	76
MCW-12	1125	5/20/2017		=	20	78
MCW-12	1125	5/21/2017		=	20	80
MCW-12	1125	5/22/2017		=	20	82
MCW-12	1125	5/23/2017		=	20	84
MCW-12	1130	5/24/2017 ♦		=	16,000	107
MCW-12	1130	5/25/2017		=	16,000	128
MCW-12	1130	5/26/2017		=	16,000	152



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
				E. coli		E. coli
				(235 MPN)		(126 MPN)
MCW-12	1130	5/27/2017	=	16,000		182
MCW-12	1130	5/28/2017	=	16,000		217
MCW-12	1130	5/29/2017	=	16,000		259
MCW-12	1000	5/30/2017 ♦	=	40		253
MCW-12	1000	5/31/2017	=	40		247
MCW-14b	1050	5/1/2017	=	130		100
MCW-14b	1035	5/2/2017 ♦	=	45		95
MCW-14b	1035	5/3/2017	=	45		91
MCW-14b	1035	5/4/2017	=	45		88
MCW-14b	1035	5/5/2017	=	45		85
MCW-14b	1035	5/6/2017	=	45		82
MCW-14b	1035	5/7/2017	=	45		79
MCW-14b	1035	5/8/2017	=	45		76
MCW-14b	1135	5/9/2017 ♦	=	230		78
MCW-14b	1135	5/10/2017	=	230		79
MCW-14b	1135	5/11/2017	=	230		88
MCW-14b	1135	5/12/2017	=	230		98
MCW-14b	1135	5/13/2017	=	230		109
MCW-14b	1135	5/14/2017	=	230		121
MCW-14b	1135	5/15/2017	=	230		134
MCW-14b	1040	5/16/2017 ♦	=	20		137
MCW-14b	1040	5/17/2017	=	20		140
MCW-14b	1040	5/18/2017	=	20		126
MCW-14b	1040	5/19/2017	=	20		113
MCW-14b	1040	5/20/2017	=	20		102
MCW-14b	1040	5/21/2017	=	20		91
MCW-14b	1040	5/22/2017	=	20		82
MCW-14b	1040	5/23/2017	=	20		74
MCW-14b	1040	5/24/2017 ♦	=	340		73
MCW-14b	1040	5/25/2017	=	340		75
MCW-14b	1040	5/26/2017	=	340		77
MCW-14b	1040	5/27/2017	=	340		80
MCW-14b	1040	5/28/2017	=	340		83
MCW-14b	1040	5/29/2017	=	340		85
MCW-14b	1040	5/30/2017 ♦	=	20		80
MCW-14b	1040	5/31/2017	=	20		75
MCW-15c	1000	5/1/2017	=	230		46
MCW-15c	1000	5/2/2017 ♦	=	45		44
MCW-15c	1000	5/3/2017	=	45		42
MCW-15c	1000	5/4/2017	=	45		44
MCW-15c	1000	5/5/2017	=	45		46
MCW-15c	1000	5/6/2017	=	45		49
MCW-15c	1000	5/7/2017	=	45		51
MCW-15c	1000	5/8/2017	=	45		54
MCW-15c	1015	5/9/2017 ♦	=	230		59



				Single Sample (adjusted for rain, dry and NDs)		Geomean
Location		Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	1015	5/10/2017		=	230	64
MCW-15c	1015	5/11/2017		=	230	69
MCW-15c	1015	5/12/2017		=	230	76
MCW-15c	1015	5/13/2017		=	230	82
MCW-15c	1015	5/14/2017		=	230	90
MCW-15c	1015	5/15/2017		=	230	98
MCW-15c	1015	5/16/2017 ♦		=	230	108
MCW-15c	1015	5/17/2017		=	230	120
MCW-15c	1015	5/18/2017		=	230	123
MCW-15c	1015	5/19/2017		=	230	125
MCW-15c	1015	5/20/2017		=	230	128
MCW-15c	1015	5/21/2017		=	230	130
MCW-15c	1015	5/22/2017		=	230	132
MCW-15c	1015	5/23/2017		=	230	135
MCW-15c	955	5/24/2017 ♦		=	790	143
MCW-15c	955	5/25/2017		=	790	149
MCW-15c	955	5/26/2017		=	790	156
MCW-15c	955	5/27/2017		=	790	162
MCW-15c	955	5/28/2017		=	790	169
MCW-15c	955	5/29/2017		=	790	176
MCW-15c	1000	5/30/2017 ♦		=	40	166
MCW-15c	1000	5/31/2017		=	40	157
MCW-17	915	5/1/2017		=	300	87
MCW-17	930	5/2/2017 ♦		=	20	84
MCW-17	930	5/3/2017		=	20	80
MCW-17	930	5/4/2017		=	20	79
MCW-17	930	5/5/2017		=	20	77
MCW-17	930	5/6/2017		=	20	75
MCW-17	930	5/7/2017		=	20	73
MCW-17	930	5/8/2017		=	20	72
MCW-17	930	5/9/2017 ♦		=	230	75
MCW-17	930	5/10/2017		=	230	78
MCW-17	930	5/11/2017		=	230	81
MCW-17	930	5/12/2017		=	230	85
MCW-17	930	5/13/2017		=	230	88
MCW-17	930	5/14/2017		=	230	92
MCW-17	930	5/15/2017		=	230	96
MCW-17	930	5/16/2017 ♦		=	230	102
MCW-17	930	5/17/2017		=	230	108
MCW-17	930	5/18/2017		=	230	110
MCW-17	930	5/19/2017		=	230	112
MCW-17	930	5/20/2017		=	230	114
MCW-17	930	5/21/2017		=	230	116
MCW-17	930	5/22/2017		=	230	119
MCW-17	930	5/23/2017		=	230	121
MCW-17	915	5/24/2017 ♦		=	700	128



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-17	915	5/25/2017		=	700	132
MCW-17	915	5/26/2017		=	700	135
MCW-17	915	5/27/2017		=	700	139
MCW-17	915	5/28/2017		=	700	143
MCW-17	915	5/29/2017		=	700	147
MCW-17	920	5/30/2017 ♦		=	800	152
MCW-17	920	5/31/2017		=	800	157
MCW-18	-	5/1/2017	Dry	<	10	10
MCW-18	-	5/2/2017 ♦	Dry	<	10	10
MCW-18	-	5/3/2017	Dry	<	10	10
MCW-18	-	5/4/2017	Dry	<	10	10
MCW-18	-	5/5/2017	Dry	<	10	10
MCW-18	-	5/6/2017	Dry	<	10	10
MCW-18	-	5/7/2017	Dry	<	10	10
MCW-18	-	5/8/2017	Dry	<	10	10
MCW-18	-	5/9/2017 ♦	Dry	<	10	10
MCW-18	-	5/10/2017	Dry	<	10	10
MCW-18	-	5/11/2017	Dry	<	10	10
MCW-18	-	5/12/2017	Dry	<	10	10
MCW-18	-	5/13/2017	Dry	<	10	10
MCW-18	-	5/14/2017	Dry	<	10	10
MCW-18	-	5/15/2017	Dry	<	10	10
MCW-18	-	5/16/2017 ♦	Dry	<	10	10
MCW-18	-	5/17/2017	Dry	<	10	10
MCW-18	-	5/18/2017	Dry	<	10	10
MCW-18	-	5/19/2017	Dry	<	10	10
MCW-18	-	5/20/2017	Dry	<	10	10
MCW-18	-	5/21/2017	Dry	<	10	10
MCW-18	-	5/22/2017	Dry	<	10	10
MCW-18	-	5/23/2017	Dry	<	10	10
MCW-18	-	5/24/2017 ♦	Dry	<	10	10
MCW-18	-	5/25/2017	Dry	<	10	10
MCW-18	-	5/26/2017	Dry	<	10	10
MCW-18	-	5/27/2017	Dry	<	10	10
MCW-18	-	5/28/2017	Dry	<	10	10
MCW-18	-	5/29/2017	Dry	<	10	10
MCW-18	-	5/30/2017 ♦	Dry	<	10	10
MCW-18	-	5/31/2017	Dry	<	10	10

Notes:

Weeks with wet weather samples (collected less than 72 hours after a day with >0.1" rain) use the previous non-rain single sample value to calculate the geomean.

Results of <20 are adjusted to use half the MDL (=10) in the calculation of the geomean

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010

♦ Date of sampling



county of ventura



JEFF PRATT
Agency Director

Central Services Department
J. Tabin Cosio, Director

Engineering Services Department
Christopher Cooper, Director

Transportation Department
David Fleisch, Director

Water & Sanitation Department
Michaela Brown, Director

Watershed Protection District
Glenn Shephard, Director

July 24, 2017

Kangshi Wang, Ph.D.
California Regional Water Quality Control Board
Los Angeles Region
Standards & TMDL Unit
320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6780

**Subject: MALIBU CREEK AND LAGOON BACTERIA TMDL COMPLIANCE
MONITORING FOR VENTURA COUNTY AND CITY OF THOUSAND OAKS**

Dear Dr. Wang:

The table below summarizes the results of the weekly monitoring effort required by the Malibu Creek and Lagoon Bacteria TMDL (TMDL) Compliance Monitoring Plan (CMP) for the month of June 2017. Sites were sampled weekly on Tuesdays (June 6, 13, 20), except for one instance when sites were sampled Monday (June 26) due to staffing conflicts. Sites without results reported were not sampled due to insufficient flow and are labeled "Dry." Daily geomeans were calculated using results from the previous 30 days (actual sampling date marked with ♦). Weeks with wet weather samples (collected less than 72 hours after a day with > 0.1" rain) use the previous non-rain single sample value to calculate the geomean. Half the detection limit was used for the purpose of calculating the daily geomean for sites with results reported as < 20 MPN/100ml or for dry weather when no sample was taken.

Fecal coliform monitoring has been discontinued, as approved by the Los Angeles Regional Water Quality Control Board on October 31, 2014, in alignment with the Regional Board's removal of the fecal coliform objective for REC-1 freshwaters from the TMDL on June 7, 2012 and subsequent approval by the U.S. Environmental Protection Agency on July 2, 2014.

If you have any questions regarding this matter, please contact me at (805) 654-3942.

Sincerely,

Anne Anselm

Deputy Director, Watershed Protection District

CC: Glenn Shephard, Director Watershed Protection District
Ewelina Mutkowska, County of Ventura
Paul Jorgensen, City of Thousand Oaks (via email)
Joe Bellomo, Willdan Associates (via email)
Kelly Fisher, City of Agoura Hills (via email)
Allen Ma, County of Los Angeles (via email)



Table 1. Weekly sampling results

Location	Time	Date	Rain	Single Sample (as sampled)	
					E. coli (235 MPN)
MCW-8b	1230	6/6/2017 ♦		=	40
MCW-8b	1140	6/13/2017 ♦		<	20
MCW-8b	1255	6/20/2017 ♦		<	20
MCW-8b	1230	6/26/2017 ♦		<	20
MCW-9	-	6/6/2017 ♦			Dry
MCW-9	-	6/13/2017 ♦			Dry
MCW-9	-	6/20/2017 ♦			Dry
MCW-9	-	6/26/2017 ♦			Dry
MCW-12	1130	6/6/2017 ♦		=	80
MCW-12	1100	6/13/2017 ♦		=	300
MCW-12	1200	6/20/2017 ♦		=	110
MCW-12	1125	6/26/2017 ♦		=	330
MCW-14b	1040	6/6/2017 ♦		<	20
MCW-14b	1030	6/13/2017 ♦		=	20
MCW-14b	1115	6/20/2017 ♦		=	110
MCW-14b	1030	6/26/2017 ♦		=	78
MCW-15c	1000	6/6/2017 ♦		<	20
MCW-15c	1000	6/13/2017 ♦		=	500
MCW-15c	1040	6/20/2017 ♦		=	110
MCW-15c	940	6/26/2017 ♦		=	1,300
MCW-17	920	6/6/2017 ♦		=	40
MCW-17	935	6/13/2017 ♦		=	230
MCW-17	-	6/20/2017 ♦			Dry
MCW-17	-	6/26/2017 ♦			Dry
MCW-18	-	6/6/2017 ♦			Dry
MCW-18	-	6/13/2017 ♦			Dry
MCW-18	-	6/20/2017 ♦			Dry
MCW-18	-	6/26/2017 ♦			Dry

Notes:

* The RWQCB granted permission to replace site MCW-15b with site Special-05 (renamed MCW-15c) on August 11th, 2010.

♦ Date of sampling



Table 2. Computation of daily geomean

Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-8b	1240	6/1/2017		=	40	285
MCW-8b	1240	6/2/2017		=	40	292
MCW-8b	1240	6/3/2017		=	40	298
MCW-8b	1240	6/4/2017		=	40	305
MCW-8b	1240	6/5/2017		=	40	313
MCW-8b	1230	6/6/2017 ♦		=	40	320
MCW-8b	1230	6/7/2017		=	40	327
MCW-8b	1230	6/8/2017		=	40	301
MCW-8b	1230	6/9/2017		=	40	277
MCW-8b	1230	6/10/2017		=	40	254
MCW-8b	1230	6/11/2017		=	40	234
MCW-8b	1230	6/12/2017		=	40	215
MCW-8b	1140	6/13/2017 ♦		<	10	189
MCW-8b	1140	6/14/2017		<	10	166
MCW-8b	1140	6/15/2017		<	10	152
MCW-8b	1140	6/16/2017		<	10	139
MCW-8b	1140	6/17/2017		<	10	128
MCW-8b	1140	6/18/2017		<	10	118
MCW-8b	1140	6/19/2017		<	10	108
MCW-8b	1255	6/20/2017 ♦		<	10	99
MCW-8b	1255	6/21/2017		<	10	91
MCW-8b	1255	6/22/2017		<	10	84
MCW-8b	1255	6/23/2017		<	10	65
MCW-8b	1255	6/24/2017		<	10	51
MCW-8b	1255	6/25/2017		<	10	40
MCW-8b	1230	6/26/2017 ♦		<	10	31
MCW-8b	1230	6/27/2017		<	10	24
MCW-8b	1230	6/28/2017		<	10	19
MCW-8b	1230	6/29/2017		<	10	18
MCW-8b	1230	6/30/2017		<	10	17
MCW-9		6/1/2017	Dry	<	10	10
MCW-9	-	6/2/2017	Dry	<	10	10
MCW-9	-	6/3/2017	Dry	<	10	10
MCW-9	-	6/4/2017	Dry	<	10	10
MCW-9	-	6/5/2017	Dry	<	10	10
MCW-9	-	6/6/2017 ♦	Dry	<	10	10
MCW-9	-	6/7/2017	Dry	<	10	10
MCW-9	-	6/8/2017	Dry	<	10	10
MCW-9	-	6/9/2017	Dry	<	10	10
MCW-9	-	6/10/2017	Dry	<	10	10
MCW-9	-	6/11/2017	Dry	<	10	10
MCW-9	-	6/12/2017	Dry	<	10	10
MCW-9	-	6/13/2017 ♦	Dry	<	10	10
MCW-9	-	6/14/2017	Dry	<	10	10



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli	E. coli
					(235 MPN)	(126 MPN)
MCW-9	-	6/15/2017	Dry	<	10	10
MCW-9	-	6/16/2017	Dry	<	10	10
MCW-9	-	6/17/2017	Dry	<	10	10
MCW-9	-	6/18/2017	Dry	<	10	10
MCW-9	-	6/19/2017	Dry	<	10	10
MCW-9	-	6/20/2017 ♦	Dry	<	10	10
MCW-9	-	6/21/2017	Dry	<	10	10
MCW-9	-	6/22/2017	Dry	<	10	10
MCW-9	-	6/23/2017	Dry	<	10	10
MCW-9	-	6/24/2017	Dry	<	10	10
MCW-9	-	6/25/2017	Dry	<	10	10
MCW-9	-	6/26/2017 ♦	Dry	<	10	10
MCW-9	-	6/27/2017	Dry	<	10	10
MCW-9	-	6/28/2017	Dry	<	10	10
MCW-9	-	6/29/2017	Dry	<	10	10
MCW-9	-	6/30/2017	Dry	<	10	10
MCW-12	1000	6/1/2017		=	40	236
MCW-12	1000	6/2/2017		=	40	224
MCW-12	1000	6/3/2017		=	40	214
MCW-12	1000	6/4/2017		=	40	204
MCW-12	1000	6/5/2017		=	40	194
MCW-12	1130	6/6/2017 ♦		=	80	189
MCW-12	1130	6/7/2017		=	80	185
MCW-12	1130	6/8/2017		=	80	177
MCW-12	1130	6/9/2017		=	80	169
MCW-12	1130	6/10/2017		=	80	162
MCW-12	1130	6/11/2017		=	80	155
MCW-12	1130	6/12/2017		=	80	148
MCW-12	1100	6/13/2017 ♦		=	300	148
MCW-12	1100	6/14/2017		=	300	148
MCW-12	1100	6/15/2017		=	300	162
MCW-12	1100	6/16/2017		=	300	177
MCW-12	1100	6/17/2017		=	300	194
MCW-12	1100	6/18/2017		=	300	213
MCW-12	1100	6/19/2017		=	300	233
MCW-12	1200	6/20/2017 ♦		=	110	246
MCW-12	1200	6/21/2017		=	110	261
MCW-12	1200	6/22/2017		=	110	276
MCW-12	1200	6/23/2017		=	110	234
MCW-12	1200	6/24/2017		=	110	198
MCW-12	1200	6/25/2017		=	110	168
MCW-12	1125	6/26/2017 ♦		=	330	147
MCW-12	1125	6/27/2017		=	330	129
MCW-12	1125	6/28/2017		=	330	114



Location	Time	Date	Rain	Single Sample (adjusted for rain, dry and NDs)		Geomean
					E. coli (235 MPN)	E. coli (126 MPN)
MCW-12	1125	6/29/2017		=	330	122
MCW-12	1125	6/30/2017		=	330	131
MCW-14b	1040	6/1/2017		=	20	73
MCW-14b	1040	6/2/2017		=	20	71
MCW-14b	1040	6/3/2017		=	20	69
MCW-14b	1040	6/4/2017		=	20	68
MCW-14b	1040	6/5/2017		=	20	66
MCW-14b	1040	6/6/2017 ♦		<	10	63
MCW-14b	1040	6/7/2017		<	10	60
MCW-14b	1040	6/8/2017		<	10	54
MCW-14b	1040	6/9/2017		<	10	48
MCW-14b	1040	6/10/2017		<	10	43
MCW-14b	1040	6/11/2017		<	10	39
MCW-14b	1040	6/12/2017		<	10	35
MCW-14b	1030	6/13/2017 ♦		=	20	33
MCW-14b	1030	6/14/2017		=	20	30
MCW-14b	1030	6/15/2017		=	20	30
MCW-14b	1030	6/16/2017		=	20	30
MCW-14b	1030	6/17/2017		=	20	30
MCW-14b	1030	6/18/2017		=	20	30
MCW-14b	1030	6/19/2017		=	20	30
MCW-14b	1115	6/20/2017 ♦		=	110	32
MCW-14b	1115	6/21/2017		=	110	34
MCW-14b	1115	6/22/2017		=	110	36
MCW-14b	1115	6/23/2017		=	110	34
MCW-14b	1115	6/24/2017		=	110	33
MCW-14b	1115	6/25/2017		=	110	32
MCW-14b	1030	6/26/2017 ♦		=	78	30
MCW-14b	1030	6/27/2017		=	78	29
MCW-14b	1030	6/28/2017		=	78	27
MCW-14b	1030	6/29/2017		=	78	29
MCW-14b	1030	6/30/2017		=	78	30
MCW-15c	1000	6/1/2017		=	40	156
MCW-15c	1000	6/2/2017		=	40	155
MCW-15c	1000	6/3/2017		=	40	155
MCW-15c	1000	6/4/2017		=	40	154
MCW-15c	1000	6/5/2017		=	40	154
MCW-15c	1000	6/6/2017 ♦		<	10	146
MCW-15c	1000	6/7/2017		<	10	139
MCW-15c	1000	6/8/2017		<	10	128
MCW-15c	1000	6/9/2017		<	10	117
MCW-15c	1000	6/10/2017		<	10	108
MCW-15c	1000	6/11/2017		<	10	99
MCW-15c	1000	6/12/2017		<	10	91
MCW-15c	1000	6/13/2017 ♦		=	500	95



				Single Sample (adjusted for rain, dry and NDs)		Geomean
Location		Date	Rain		E. coli (235 MPN)	E. coli (126 MPN)
MCW-15c	1000	6/14/2017		=	500	99
MCW-15c	1000	6/15/2017		=	500	102
MCW-15c	1000	6/16/2017		=	500	104
MCW-15c	1000	6/17/2017		=	500	107
MCW-15c	1000	6/18/2017		=	500	110
MCW-15c	1000	6/19/2017		=	500	113
MCW-15c	1040	6/20/2017 ♦		=	110	110
MCW-15c	1040	6/21/2017		=	110	107
MCW-15c	1040	6/22/2017		=	110	105
MCW-15c	1040	6/23/2017		=	110	98
MCW-15c	1040	6/24/2017		=	110	92
MCW-15c	1040	6/25/2017		=	110	86
MCW-15c	940	6/26/2017 ♦		=	1,300	88
MCW-15c	940	6/27/2017		=	1,300	89
MCW-15c	940	6/28/2017		=	1,300	90
MCW-15c	940	6/29/2017		=	1,300	102
MCW-15c	940	6/30/2017		=	1,300	114
MCW-17	920	6/1/2017		=	800	178
MCW-17	920	6/2/2017		=	800	201
MCW-17	920	6/3/2017		=	800	227
MCW-17	920	6/4/2017		=	800	257
MCW-17	920	6/5/2017		=	800	291
MCW-17	920	6/6/2017 ♦		=	40	298
MCW-17	920	6/7/2017		=	40	305
MCW-17	920	6/8/2017		=	40	292
MCW-17	920	6/9/2017		=	40	280
MCW-17	920	6/10/2017		=	40	269
MCW-17	920	6/11/2017		=	40	258
MCW-17	920	6/12/2017		=	40	247
MCW-17	935	6/13/2017 ♦		=	230	251
MCW-17	935	6/14/2017		=	230	256
MCW-17	935	6/15/2017		=	230	256
MCW-17	935	6/16/2017		=	230	256
MCW-17	935	6/17/2017		=	230	256
MCW-17	935	6/18/2017		=	230	256
MCW-17	935	6/19/2017		=	230	256
MCW-17	-	6/20/2017 ♦	Dry	<	10	230
MCW-17	-	6/21/2017	Dry	<	10	207
MCW-17	-	6/22/2017	Dry	<	10	187
MCW-17	-	6/23/2017	Dry	<	10	162
MCW-17	-	6/24/2017	Dry	<	10	141
MCW-17	-	6/25/2017	Dry	<	10	122
MCW-17	-	6/26/2017 ♦	Dry	<	10	106
MCW-17	-	6/27/2017	Dry	<	10	92
MCW-17	-	6/28/2017	Dry	<	10	80
MCW-17	-	6/29/2017	Dry	<	10	69





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Bacteria Total Maximum Daily Load Compliance Report - Draft

Harbor Beaches of Ventura County (Kiddie Beach and Hobie Beach)

Prepared for

Ventura County Public Works Agency
800 S. Victoria Avenue
Ventura, California 93009

**Ventura County Watershed Protection
District**
Ventura, California, 93009

City of Oxnard
305 West Third Street -
Third Floor
Oxnard, California 93030

Prepared by

Geosyntec Consultants, Inc.
924 Anacapa Street, Suite 4A
Santa Barbara, CA 93111

December 16, 2016

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1. INTRODUCTION

The water quality of the Harbor Beaches of Ventura County, Kiddie and Hobie, is regulated by a Bacteria Total Maximum Daily Load (TMDL) (Resolution R2007-017) effective December 18, 2008. The TMDL requires weekly beach monitoring, the implementation of Best Management Practices (BMPs) to control sources of bacteria, and achievement of Waste Load Allocations (WLAs) (expressed as allowable exceedance days). The TMDL requires responsible MS4 agencies to submit compliance reports by six years (December 18, 2014), eight years (December 18, 2016), and ten years (December 18, 2018) after the effective date of the TMDL. These Compliance Report must include: an evaluation of monitoring data with regards to final dry weather, interim wet weather, and rolling 30-day geometric mean WLAs; a summary of recently completely TMDL special studies; and an assessment of BMPs currently implemented.

As required by TMDL, in December 2014, compliance reports were submitted for the County of Ventura and Ventura County Watershed Protection District (Geosyntec Consultants, 2014b) and for the City of Oxnard (Geosyntec Consultants, 2014a). This Compliance Report satisfies the 2016 TMDL reporting requirements for the County of Ventura (County), the Ventura County Watershed Protection District (VCWPD), and the City of Oxnard (City).

1.1 TMDL Background

The Clean Water Act (CWA) of 1972 provides the basis for the protection of all inland surface waters, estuaries, and coastal waters. The federal Environmental Protection Agency (EPA) is responsible for administering the CWA and developing regulations, but may delegate its authority to the State.

California's primary statute governing water quality is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the California State Water Resources Control Board (State Board) and nine California Regional Water Quality Control Boards broad powers to protect water quality, and it is the primary vehicle for the administration of California's regulations under the federally delegated responsibilities of the CWA. The governing Regional Board for the Los Angeles area watersheds is the Los Angeles Regional Water Quality Control Board (LARWQCB).

The Porter Cologne Act is implemented in the Los Angeles Region by the California Water Quality Control Plan, Los Angeles Region (Basin Plan). The Basin Plan sets water quality standards for the Los Angeles Region, which includes beneficial uses for surface and groundwater with numeric and narrative objectives necessary to support those uses.

Section 303(d) of the CWA requires that states conduct a biennial assessment of waters and identify those waters that are not achieving water quality objectives, referred to as the 303(d) list. The 303(d) list outlines the impaired waterbody and the specific pollutant(s) for which it is impaired. Once listed on the 303(d) list, all waterbodies are subject to the development of a TMDL. A TMDL establishes the maximum amount of a pollutant that a waterbody can receive and still meet the applicable water quality standard for that pollutant.

1.2 TMDL Requirements

The State Board identified the Harbor Beaches of Ventura County (Harbor Beaches) as impaired by indicator bacteria based on REC-1 water quality objectives and placed them on the 303(d) list in 2006. REC-1 water quality objectives for marine waters include the following:

1. Rolling 30-day Geometric Mean Limits¹
 - a. Total coliform density shall not exceed 1,000/100 mL
 - b. Fecal coliform density shall not exceed 200/100 mL
 - c. Enterococcus density shall not exceed 35/100 mL
2. Single Sample Limits
 - a. Total coliform density shall not exceed 10,000/100 mL
 - b. Fecal coliform density shall not exceed 400/100 mL
 - c. Enterococcus density shall not exceed 104/100 mL
 - d. Total coliform density shall not exceed 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1

On December 18, 2008, the EPA made effective the TMDL for bacteria as an amendment to the Basin Plan (Resolution R2007-017). The TMDL was then incorporated into the current version of the Ventura County MS4 permit in 2009¹. Allowable pollutant loadings under the TMDL, WLAs, are expressed as an allowable number of days per year that the water quality objectives can be exceeded. The allowable number of exceedance days for each monitoring site is based on the more stringent of two criteria: (1) exceedance days in the designated reference system, or (2) exceedance days based on historical bacteriological data at the monitoring site, because the TMDL was developed based on a reference system/antidegradation approach. This ensures that bacteriological water

¹ The geometric mean WLAs are an exception as they were included in the TMDL but not incorporated in the 2009 Ventura County MS4 permit. However, the MS4 Permit is currently being renewed by the LARWQCB and is expected to incorporate geometric mean WLAs to reflect the TMDL.

quality is at least as good as that of a largely undeveloped system and that there is no degradation of existing water quality.

Both interim and final single sample and geometric mean exceedance WLAs are provided in the TMDL for the County, VCWPD, the City, and Caltrans². The WLAs are provided in the TMDL for three different seasonal conditions within the TMDL year (November 1 – October 31), which include summer (April 1 – October 31), winter (November 1 – March 31) and wet weather³ (for single sample WLA only). Interim WLAs became effective upon the effective date of the TMDL (December 18, 2008) and are assigned for the duration of the implementation schedule. Final WLAs became effective five years after TMDL approval (December 18, 2013) for dry weather and geometric means and will go into effect ten years after TMDL approval (December 18, 2018) for wet weather.

The TMDL requires that weekly beach monitoring continue at the two compliance monitoring locations where monitoring is conducted to comply with Assembly Bill No. 411 (AB411): Ventura County Environmental Health Division (VCEHD) 36000 (at Hobie Beach) and VCEHD 37000 (at Kiddie Beach). The monitoring should be conducted on a year-round basis in ankle- to knee-high water, consistent with AB411 compliance monitoring requirements. In the situation that WLAs are exceeded at the compliance monitoring locations, then structural or non-structural BMPs are required to be implemented.

2. BACKGROUND

2.1 Channel Islands Harbor and Harbor Beaches

The Harbor Beaches are located within the Channel Islands Harbor (Harbor), along the southern California coast in Ventura County (Figure 1). The Harbor Beaches are located near the Harbor entrance at the southern terminus of the Harbor along the east side of the main channel as it turns north. Towards the north, the main channel divides into a West Channel and an East Channel. The West Channel becomes Edison Channel, which continues north past the Mandalay Bay Generating Station and reenters the Pacific Ocean approximately 3.6 miles north of the southern entrance to the Harbor. The Channel Islands Harbor includes approximately 2,150 boat slips, four yacht clubs, and nine marinas. The tributary area draining to the Harbor is approximately 11.58 square miles in

² Caltrans activities are not included in this Compliance Report.

³ defined as days with 0.1 inch of rain or greater and the three days following

size and is comprised of areas within the jurisdictions of the County (3.07 square miles), the City of Oxnard (7.93 square miles) and the City of Port Hueneme (0.58 square miles).

The Army Corp of Engineers designed and created the Kiddie and Hobie Beaches as “surge beaches” to collectively absorb the impact of tidal surges and, as a consequence, prevent infrastructure damage in the Harbor. Protection against tidal surges remains the primary purpose of the Harbor Beaches and each beach also possesses a surge wall designed for this purpose. Providing water contact recreation was not the Harbor Beaches’ original purpose, but rather has evolved to be a beneficial use. Kiddie Beach, comprised mainly of sand, and Hobie Beach, comprised mainly of rocks, are situated adjacent to one another. Kiddie Beach is located at the end of the southern entrance jetty and Hobie beach is located just to the north of Kiddie Beach. Kiddie Beach is approximately 430 feet long with a width ranging from about 120 feet wide at Mean Lower Low Water (MLLW) to 70 feet at Mean Higher High Water (MHHW). Hobie Beach is approximately 400 feet long with a width ranging from 75 to 250 feet at MLLW to being nearly completely inundated at MHHW.

2.2 County MS4 Area Draining to the Harbor Beaches

The County owns a single MS4 outfall that discharges wet weather runoff directly to the Harbor Beaches and dry weather flows are diverted year-round (since April 2015) to the sewer system⁴. This outfall, located immediately on the south side of Kiddie Beach, is the discharge point for a small storm drain network (33 acres) in the Silver Strand Neighborhood (Figure 2). The County owns additional MS4 outfalls that discharge to the greater Harbor area, including an MS4 that drains a portion of the Hollywood-by-the-sea neighborhood (west of the Harbor Beaches), and approximately 17 outfalls which drain a section of Harbor Blvd. and the Harbor parking lots to the northwest of the Harbor Beaches. Additionally, the VCWPD owns one MS4 that discharges into Edison Channel north of West 5th Street collecting runoff from mostly agricultural land uses and the Oxnard Airport. County urban land use in the Harbor watershed includes single-family residential (19.1%), multi-family residential (15.3%), commercial (10.1%), marina water facilities (28.8%), and parks and recreation (26.7%).

The predominant MS4 network of the watershed (the Oxnard West Drain) discharges into the Harbor on the north side of Channel Islands Boulevard, approximately one mile north of the Harbor Beaches. The Oxnard West Drain, owned by VCWPD, starts in the upper reaches of the watershed, runs south along Ventura Road and then west along Channel Islands Boulevard to the Harbor. The majority of the Harbor watershed (4.37 square miles

⁴ See Section 5.3.3 for details regarding the San Nicholas pump station and diversion structure.

of single- and multi-family residential, education, commercial and industrial land uses) drains into the Oxnard West Drain.

2.3 City MS4 Area Draining to the Harbor Beaches

The City owns a single MS4 outfall that discharges directly to the Harbor Beaches. This outfall, located immediately on the north side of Hobie Beach, is the discharge point for a short storm drain connecting two street inlets on Victoria Avenue to the Harbor (Figure 3). The City owns additional MS4 outfalls that discharge to the greater Harbor area, all of which are located to the north of the Harbor Beaches.

The City of Oxnard also owns smaller drains along Hemlock and Wooley Road that collect runoff from single- and multi-family residential and commercial land uses that discharge into the Harbor between Channel Islands Boulevard and west 5th Street, as well as sheet flow from adjacent land uses (vacant, single- and multi-family land uses) to the west of the Harbor.

City land use in the Harbor watershed include single-family residential housing (48.0%), multi-family residential housing (14.8%), commercial (12.2%), agricultural (6.5%), vacant (4.3%), transportation (4.1%), education (3.8%), parks and recreation (3.7%), industrial areas (1.4%), and marina water facilities (1.3%) (shown in Figure 3).

3. COMPLIANCE MONITORING

Appendix A contains a detailed discussion of (1) the compliance monitoring data that were collected after the TMDL effective date; (2) the data analysis performed; and (3) the data analysis results that were obtained. The following sections briefly summarize the analysis methodology and the data analysis results

3.1 Analysis methodology

Monitoring at the CIH Beaches is based on TMDL and State monitoring requirements. Monitoring occurs at the beach compliance monitoring locations on a weekly frequency, year-round. An exception is during dry weather, when follow-up samples are typically collected the day after a sample exceeds the single sample water quality objective. The

following analysis includes all data (i.e., weekly and follow-up samples) collected from February 4, 2009 through October 31, 2016⁵ and is described in detail in Appendix A

The interim and final single sample WLAs, based on a weekly sampling frequency and expressed as annual allowable exceedance days (AEDs), are shown in Table 1.

Table 1. Interim and Final Single Sample WLAs for Weekly Sampled Sites

Season	Interim WLAs (AEDs)			Final WLAs (AEDs)		
	Compliance Deadline	Hobie Beach	Kiddie Beach	Compliance Deadline	Hobie Beach	Kiddie Beach
Summer Dry	Dec. 18, 2008	6	8	Dec. 18, 2013	0	0
Winter Dry		4	4		1	1
Wet		6	5	Dec. 18, 2018	3	3

The geometric mean WLAs are not incorporated into the Ventura County MS4 permit, however they are defined in the TMDL and have been evaluated here for informational purposes. The interim and final 30-day rolling geometric mean WLAs, based on a weekly sampling frequency and expressed as AEDs, are shown in Table 2.

Table 2. Interim and Final 30-day Rolling Geometric Mean WLAs for Weekly Sampled Sites

Season	Interim WLAs (AEDs)			Final WLAs (AEDs)		
	Compliance Deadline	Hobie Beach	Kiddie Beach	Compliance Deadline	Hobie Beach	Kiddie Beach
Summer	Dec. 18, 2008	12	8	Dec. 18, 2013	0	0
Winter		13	14		0	0

For each sample result, the measured indicator bacteria concentrations were compared to the single sample water quality objectives. If any one of the objectives were exceeded, one exceedance was counted, with exceedance counts summed by season to compare with weekly sampling allowed exceedance days. Rolling 30-day geometric means were calculated on sample days based on a minimum of five samples in the 30-day period during each TMDL season (November 1 – October 31). Similar to single sample results,

⁵ This time period represents monitoring since the TMDL effective date through the end of the 2016 TMDL year, as monitoring data was available. This period does not include 12/18/2008 through 1/28/2009 (as described in Appendix A) because no funding was available for monitoring during this time (i.e., state budget cuts for ocean water testing).

calculated geometric means were compared to geometric mean water quality objectives to determine total exceedance counts by season.

3.2 Data analysis results

The following results are summarized by TMDL season. Both beaches had instances of missing weekly samples due to unavailability of funding (12/18/2008 – 1/28/2009) and no public access caused by maintenance/dredging activities; these periods with missing data are identified and explained in Appendix A.

3.2.1 Summer season

Table 3 summarizes summer season exceedance results. No exceedances of the interim AEDs were observed, and the final AEDs were only exceeded at Kiddie Beach during the 2014 TMDL year for both single sample and geometric mean.

Table 3. Summer Exceedances (April 1 - October 31)

TMDL Year ¹	Single Sample Exceedances (excludes wet weather) ^{2,3}		Geometric Mean Exceedances (dry and wet weather) ^{2,3}	
	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
<i>Interim AEDs</i>	6	8	12	8
2009	2.0	1.3	0	0
2010	0	0.14	0	0
2011	1.4	0	0	0
2012	1.3	2.0	0	3.0
2013	0.14	0.43	0	2.0
<i>Final AEDs</i>	0	0	0	0
2014	0	1.3	0	1.0
2015	0	0	0	0
2016	0	0	0	0

1. The summer season includes days between April 1 and October 31.
2. As discussed in Appendix A, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.
3. Exceedances in **bold** are above the applicable WLA

3.2.2 Winter season

Winter season exceedance results are summarized in Table 4. The 2014 TMDL year winter results are compared to interim AEDs for data collected before December 18, 2013 (five years after the TMDL effective date), while data collected for the remainder of the

2014 TMDL year are compared to final AEDs. No exceedances of the interim AEDs were observed. Single sample and geometric mean final AEDs were exceeded at Kiddie Beach in 2014, 2015, and 2016. No exceedances of the final AEDs occurred at Hobie Beach.

Table 4. Winter Exceedances (Nov. 1 – Mar. 31)

TMDL Year ¹	Single Sample Exceedances (excludes wet weather) ^{2,3}		Geometric Mean Exceedances (dry and wet weather) ^{2,3}	
	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
<i>Interim AEDs</i>	<i>4</i>	<i>4</i>	<i>13</i>	<i>14</i>
2009	2.0	0	5.0	0
2010	1.1	0.14	5.0	5.1
2011	0	1.0	0	9.0
2012	0	1.1	0	3.0
2013	0	0	0	0
2014 (Interim) ⁴	1.0	2.0	0	3.0
<i>Final AEDs</i>	<i>1</i>	<i>1</i>	<i>0</i>	<i>0</i>
2014 (Final) ⁵	0	3.0	0	3.0
2015	1.0	3.0	0	12.0
2016	1.0	2.0	0	1.0

1. The winter season includes days between November 1 and March 31.
2. As discussed in Appendix A, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.
3. Exceedances in **bold** are above the applicable WLA
4. 2014 (Interim) includes data collected before December 18, 2013.
5. 2014 (Final) includes data collected on December 18, 2013 and subsequent days.

3.2.3 Wet Weather

Table 5 summarizes wet weather single sample exceedance results for each TMDL year. Interim AEDs were only exceeded once at Kiddie Beach in 2011. Final AEDs for wet weather are not yet in effect.

Table 5. Wet Weather Exceedances

TMDL Year ¹	Single Sample Exceedances ²	
	Hobie Beach	Kiddie Beach
<i>Interim AEDs</i>	<i>6</i>	<i>5</i>
2009	2	1
2010	3	3
2011	1	6
2012	3	2
2013	1	2
2014	0	0
2015	5	5
2016	1	1

1. Includes wet weather days between Nov. 1 and Oct. 31

2. Exceedances in **bold** are above the applicable WLA

4. TMDL SPECIAL STUDIES

There have been numerous studies conducted at the Harbor Beaches to identify bacteria sources and appropriate measures to decrease bacteria concentrations. Many of the studies that occurred before the TMDL effective date were described in the Harbor Beaches Dry and Wet Weather TMDL Implementation Plans (IPs) for the County and the VCWPD (Malcolm Pirnie, Inc. and Geosyntec Consultants, 2009 and Geosyntec Consultants, 2010, respectively) and the City's Dry Weather TMDL IP (City of Oxnard, 2012), and are listed below (Section 4.1). In 2013, a Microbial Source Tracking (MST) and Quantitative Microbial Risk Assessment (QMRA) study was conducted by the Southern California Coastal Water Research Project (SCCWRP) and in 2014 and 2015 the VCWPD conducted a separate MST Study. The methodology and findings of these studies are summarized in Section 4.2 and 4.3, respectively.

4.1 Previously Summarized Studies

Studies that are summarized in detail in the Harbor Beaches Dry and Wet Weather IPs include:

Harbor Beaches Monitoring Studies

- Weekly water quality beach monitoring since 1999;
- Tidal water quality monitoring in 1999 and 2000;
- Sediment disturbance water quality monitoring in 2000;
- Beach transect sampling studies in August and October of 2000;

Harbor Monitoring Studies

- Quarterly water quality monitoring in the Harbor since 1999;
- Wash-off pathogen monitoring in 2000;
- Bacteria survey along the surge wall 2000;
- Water quality monitoring at additional Harbor locations in 2000;
- Water quality monitoring of seepage from rock riprap area in 2001;

Harbor Circulation Studies

- Current and tidal hydraulics study in 2000;
- Harbor Circulation Study in 2003;
- Field surveys of circulation patterns in 2009;

Sanitary Sewer Studies

- Sewer/Storm drain interaction study in 1999;
- CCTV investigation of sanitary sewer lateral from Kiddie Beach bathroom in 2000;

Storm Drain Studies

- Storm drain water quality weekly sampling in 1999;
- CCTV investigation of storm drain in 1999;
- Dye testing of Silver Strand Pump station in 2000;

Bacteria Source Tracking and Control Studies

- Dry weather bacteria source study using DNA typing method in 2003; and
- Bird control measures efficacy study in 2006.

4.2 SCCWRP QMRA

The objectives of this study were to calculate illnesses related to swimming at the Harbor Beaches, and to support the development of site-specific indicator bacteria objectives based on the EPA's tolerable illness rates, if calculated rates were found to be low.

The QMRA study involved five steps: 1) select beach; 2) perform a source identification study; 3) determine the pathogen load linked to each source; 4) quantify exposure of swimmers to pathogen; and 5) perform risk modeling and characterization to predict the illness rates in swimmers based on exposure, ingestion, and infectious dose.

Weekly monitoring data were reviewed from 57 beach sites in Ventura County from January 1, 2007 to December 31, 2011. Both Kiddie Beach and Hobie Beach were classified in the top five beaches with the highest frequency of water quality objective exceedances. To identify possible sources of contamination at Kiddie and Hobie Beaches, observational data were collected. As a result, possible fecal sources at the beaches were

found to include human (leaking sewer lines or discharge from boat holding tanks), birds, cats, dogs, and regrowth of indicator bacteria (in sand, biofilms, kelp or seagrass, or trash).

Daily dry weather samples were collected at the Harbor Beaches for eight weeks at eight locations (three at Hobie and five at Kiddie) between June 26 and August 20, 2012. All samples were analyzed for cultural *Enterococcus*, which was detected at all sites (Figure 4). Site 1 (Hobie Beach) showed the highest levels of *Enterococcus*, exceeding the single sample water quality objective (104 MPN/100 mL) on over half of the sampling days. The highest exceedance rates at Kiddie Beach were observed at Site 5, with approximately seven percent of sampling days exceeding standards. Approximately 11 percent of all samples exceeded the single sample water quality objective for *Enterococcus*.

Rapid molecular methods (qPCR) were also performed for an *Enterococcus* marker (*EnterolA*) and two human fecal markers (HF183 and HumM2). HF183 was detected during at least 40 percent of sampling days at all eight locations and was found in two-thirds of all samples. HumM2, which is less sensitive than HF183 but more specific to human fecal pollution, was detected in seven percent of all samples. There was no correlation between HF183 and tide height or amplitude, but spatial correlation showed that the Kiddie Beach locations likely share a common source of HF183. These observations suggest evidence of a constant, diffuse source of human fecal pollution at both beaches.

Evidence suggests that the *Enterococcus* and human markers could be associated with different sources. Several possible sources of fecal indicators at the beaches were identified based on visual observations: a storm drain, sewer infrastructure, birds, domesticated dogs, or feral cats.

A storm drain outlet at the north end of Hobie Beach, submerged during high tides, had observable flow during low tides due to tidal backwater. Strong decreasing gradients in *Enterococcus* concentrations and exceedance rates were observed from the drain outlet along the beach sampling sites. Only two catch basins from the adjacent road drain to the outlet, and no surface runoff or illicit connections or discharges were observed. The drain outlet was found to function as a reservoir for *Enterococcus* with sources such as biofilms or entrapment of decaying organic material. No human markers were detected in the single grab sample from within the drain.

Sewer infrastructure near the beaches may also be a source of *Enterococcus* and human contamination, possibly through groundwater discharge. The storm drain outlet near Site

7 (shown in Figure 4) was diverted to the sanitary sewer prior to the study, but the gravel bedding outside the storm drain pipe could potentially serve as a conduit for transport of sewage-impacted groundwater if a nearby sewer is leaking. However, Enterococcus concentrations and exceedance rates near this drain outlet (Sites 7 and 8) were among the lowest in this study.

A significant population of seabirds was observed near the sampling sites, therefore it is possible that seabird waste is a source of Enterococcus at the beaches. The domesticated dogs brought to the beach by their owners were also identified as a possible fecal source based on local observations. And feral cats living in the jetty rocks were also identified as possible fecal sources, by deposit and wash-off.

Results indicated human fecal influence at the beaches, therefore the remaining phases of the QMRA study were placed on hold until the contamination has been resolved. Photographs of SCCWRP monitoring activities are shown in Appendix B.

4.3 2014/2015 MST Study

The SCCWRP QMRA suggested that likely sources contributing bacteria to Kiddie Beach include sanitary sewer lines, birds, and dogs. Additionally, 2014 dredging activities in the harbor entrance channel appeared to coincide with elevated bacteria levels at the beach, based on weekly water quality monitoring. Therefore, in 2014 and 2015 the VCWPD conducted an MST study (VCWPD, 2015) to determine the specific sources (i.e., humans, birds, and dogs) that are likely contributing bacteria to the beaches and investigate whether dredging activities in the channel were correlated with high levels of bacteria.

Sixteen samples from Kiddie Beach, collected during the period from 5/6/2014 to 1/20/2015, were analyzed⁶ for indicator bacteria and human (HF183), dog (DogBact) and bird (BirdGFD) genetic markers. The majority of samples were collected in dry weather, with the exception of 11/3/2014, 12/15/2014, and 1/12/2015, which were collected during wet weather. Observations of human, dog, and bird activity at Kiddie Beach were also noted, in addition to observation of any deposits from these sources. A summary of the MST samples, including enterococcus results, genetic marker results, and other relevant activities are shown in Table 6 and a memo describing the MST study is included in Appendix B.

⁶ Two labs were used for analyzing samples: Weston Solutions and Source Molecular Corporation. Both laboratories participated in the Source Identification Protocol Project (SIPP) in 2011.

Table 6. Summary of MST Sampling Results at Kiddie Beach

Date	Enterococcus (MPN/100 mL)	Human	Dog	Bird	Activity	Deposit	Channel dredging¹	New sewer²
5/6/2014	31	ND	ND	10,551	Human/dog	Bird	No	No
5/13/2014	<10	ND	ND	3,508	Human	ND	No	No
5/20/2014	31	ND	ND	18,215	ND	ND	No	No
5/27/2014	<10	ND	ND	10,413	Human/dog	ND	No	No
6/3/2014	<10	ND	ND	3,575	ND	Bird	No	No
9/30/2014	<10	ND	ND	ND	ND	ND	No	Constr.
10/7/2014	42	ND	DNQ	8,678	ND	ND	No	Constr.
10/14/2014	<10	ND	ND	2,220	ND	ND	No	Constr.
10/21/2014	659	ND	ND	ND	Bird	Bird	Yes	Constr.
10/22/2014	738	n/a	n/a	n/a	n/a	n/a	Yes	Yes
10/28/2014	31	ND	ND	3,152	ND	ND	Yes	Yes
11/3/2014	<31	ND	1,580	266	ND	ND	Yes	Yes
12/8/2014	165	ND	DNQ	4,400	ND	Bird	Yes	Yes
12/15/2014	222	1,540	DNQ	1,620	Human	ND	Yes	Yes
12/22/2014	124	ND	1,440	4,720	ND	ND	Yes	Yes
1/12/2015	324	ND	16,600	573	ND	ND	Yes	Yes
1/20/2015	364	ND	ND	298	ND	ND	Yes	Yes

Note: ND = not detected, DNQ = detected but not quantifiable, n/a = not analyzed.

1. Dredging activities at the channel entrance west of Kiddie Beach.

2. Rehabilitated force main was placed back in service on 10/22/2014.

Significant findings include:

- The highest Enterococcus concentrations occurred during dredging activities in the harbor entrance channel.
- The human marker was only detected (at low concentrations) in one sample and human activity was observed at the beach coinciding with this sample.
- Dog markers were detected in six samples (but not quantifiable in three) and did not correspond to observed dog activity on the beach. In addition, dog fecal deposits were not observed on the beach.
- Bird markers were detected in most (fourteen) of the samples and did not correspond to observed bird activity or deposits on the beach.
- Correlations between enterococcus and each genetic marker were analyzed using a Spearman's rank correlation test. No correlations with statistical

significance (p-value > 0.05) were found between enterococcus and any of the markers tested.

The MST study did not identify a specific source primarily contributing to the exceedances at Kiddie Beach. Therefore, the MST study recommended if exceedances continue after operation of the County storm drain diversion (discussed in Section 5.3.3 below) is updated to a year-round schedule and the implementation of other improvements (i.e. sewer rehabilitation), additional source investigations may be useful in further evaluating whether dogs, birds, and dredging activities may be the main contributors of bacteria at these beaches. Also, although only one human marker was detected at Kiddie Beach, additional human marker sampling is needed, at both Hobie and Kiddie Beaches, to conclusively determine if human waste is now absent from the beaches.

4.4 Conclusions based on various studies

Based on the previous studies conducted at the Harbor Beaches, the following findings are noted:

- Dry weather exceedances are infrequent, at low concentrations, and generally near or below the AEDs;
- Dry weather exceedances at the Harbor Beaches are localized and spatially limited to within a short distance of the beach wave wash area;
- Dry weather exceedances at the Harbor Beaches occur as a result of a variety of diffuse local sources that may include birds, bathers, sewers/groundwater (although the nearest main sewer line was repaired [see Section 5.3.1], so this source is now unlikely), and storm drains (although the San Nicholas Pump Station became operational year-round during dry weather [see Section 5.3.3], so this source is now unlikely);
- Dredging activities may directly impact indicator bacteria concentrations by stirring up sediment;
- Humans are not likely the source of indicator bacteria;
- Similar to what is found at other Southern California enclosed beaches, the lack of circulation at the Harbor Beaches facilitates an environment conducive to bacteria persistence;
- Wet weather exceedances are infrequent, at low concentrations, and generally near or below the AEDs;
- Wet weather sources to the beaches (beyond just the two nearby storm drain outfalls) are less well known, including to what extent the greater harbor waters and other storm drain outfalls contribute to these beach indicator bacteria concentrations.

4.5 Future Additional Studies

The County submitted two concept study applications to the Clean Beaches Initiative Grant Program, but a grant was not awarded. The first study proposed to conduct source identification during wet-weather and the second study was focused on dry-weather monitoring to evaluate effectiveness of implemented BMPs and infrastructure improvements. Implementation of those studies will be pending future funding opportunities.

5. BMP IMPLEMENTATION

The Dry and Wet Weather TMDL IPs identified an implementation approach for the County and VCWPD to comply with the requirements of the TMDL. The City's 2012 Dry Weather TMDL Workplan also identified various implementation measures the City intended to address for dry weather exceedances. The following section provides an overview of the wet and dry weather BMPs that the County, VCWPD, and the City have implemented (Table 7 provides an overview).

Table 7. BMP Implementation Status

	BMPs recommended in the County and VCWPD Dry Weather IP	BMPs recommended in the City Dry Weather IP	BMPs recommended in the County and VCWPD Wet Weather IP	Additional BMPs Not Identified in the IPs
BMPs Implemented	<ol style="list-style-type: none"> 1. Public Information and Participation Program 2. Proper Pet Waste Disposal 3. Feral Cat Abatement 4. Fish Waste Disposal Ordinance and Enforcement 5. Bathroom Maintenance 6. Code and Ordinance Review Program 7. Beach Grooming 8. Bird Control Measures 9. Mobile High Pressure Flushing 	<ol style="list-style-type: none"> 1. Educational Signage 2. Public Outreach 3. Catch Basin Monitoring and Maintenance 4. Street Sweeping 5. Bathroom Maintenance 6. Trash Management 7. Proper Pet Waste Disposal 8. Code and Ordinance Review Program 	<ol style="list-style-type: none"> 1. Downspout Disconnect Program 2. Pet Ownership Outreach and Enforcement Program 3. Catch Basin Cleaning 4. Structural BMPs 	<ol style="list-style-type: none"> 1. Sewer line replacement 2. Dry-Weather Diversions 3. Parking Lot Drain Removal 4. Marina Facilities 5. Ordinances
BMPs Not Implemented	<ol style="list-style-type: none"> 1. Pilot Enhanced Circulation Devices 		<ol style="list-style-type: none"> 1. Storm Drain Monitoring Program 	Not Applicable

5.1 Dry Weather IP Recommended BMPs

5.1.1 Source and Early Action Controls

5.1.1.1 Educational Signage - City

Educational signs are located at both Kiddie and Hobie Beach to educate the community and beach-goers of water quality issues at the Harbor beaches. Signage encourages the public to properly dispose of pet waste, refrain from feeding feral cats and birds, use diapers on small children while swimming, and properly dispose of trash. Examples of educational signage are included in Appendix B.

Discouraging beach visitors and residents from feeding feral cats and shore birds aids in limiting the cat and bird populations near the beaches, reducing bacterial contributions from fecal waste to the harbor waters. Proper disposal of pet waste also helps to reduce bacteria contributions, either directly into the harbor waters or through runoff, attributed to animal waste.

5.1.1.2 Public Information and Participation Program (PIPP) - County

The goals of the Public Information and Participation Program (PIPP) are to increase public knowledge of the MS4, including the adverse impacts of storm water pollution on receiving waters, and to change public behavior to implement appropriate solutions regarding waste disposal and storm water pollution. The program aims to engage communities to participate in mitigating the impacts of storm water pollution. The County has engaged in numerous actions to educate the public on issues relating to water quality. In addition to the activities discussed in the Downspout Disconnect Program and Pet Ownership Outreach Program sections, the County's ongoing efforts include the following.

- Installation of additional signage at Kiddie and Hobie Beaches, in both English and Spanish, describing potential bacteria contamination from birds and cats and advising the public not to feed the cats or birds. Signs have also been redesigned to include brighter colors and more graphics. Examples of this signage are shown in Appendix B.
- The County continues to provide information to boaters, dock tenants, and live aboards regarding water quality issues and reminders of the prohibitions against dumping in the harbor. Dye tabs also continue to be provided that reveal if holding tanks were emptied in the harbor.

- The County included a reminder for pet owners to clean up after pets in the Channel Islands Beach Community Services District News Brief issued in February 2011 and May 2014.

Implementation of the PIPP, utilizing several methods such as advertising campaigns, public service announcements, signage, and educational materials, educates the public on how they can assist in keeping the beaches clean and open for full public use. These efforts encourage the public to be conscious of their actions relating to pet waste management, feeding of feral cats and birds, use of bathroom facilities before swimming, and other issues.

5.1.1.3 Public Outreach – City

Public outreach efforts aim to educate the public on how water quality at the beaches can be potentially impacted through the storm drain system. The City website includes information explaining how pollutants travel through the storm drain system and ultimately into the ocean. The website educates on how the community can manage their use of fertilizers/pesticides, household hazardous wastes, and auto care activities to avoid releasing pollutants into the storm drains. Information about the benefits of implementing permeable pavement, rain barrels, and grass swales is also included. This educational information included on the City website is shown in Appendix B. The two storm drain detention basins were labeled with the City’s “Don’t Dump – Drains to Ocean” message on a placard located on the face of the inlet, and the placards continue to be maintained and replaced as needed. These outreach efforts educate the public on how they can assist in keeping the beaches clean and open for full public use by refraining from illegal dumping to the storm drain system.

5.1.1.4 Proper Pet Waste Disposal – County and City

County Public Health Ordinance No. 4466 states that dog and cat feces must be removed from public beaches, sidewalks, parks, school grounds or County property, and a sign is maintained to advise beach visitors of the ordinance (Ventura County Animal Control Department).

There are 20 dog waste stations located throughout the harbor and beaches, and approximately 200,000 biodegradable pet waste disposal bags are purchased by the County annually to supply the waste stations. The most popular County dog waste station is located on the jetty walkway south west of Kiddie Beach. This station is stocked daily with 200 waste bags, or approximately 73,000 bags per year.

There is also a City owned dog waste station located at Kiddie Beach that is stocked with biodegradable pet waste bags. Approximately 2,000 to 4,000 bags are used on a monthly basis, with higher usage during the summer months. Outreach relating to pet waste is also implemented through television, internet resources (Cleanwatershed.org and the City website), and radio spots. Examples of a pet waste disposal station and outreach information are shown in Appendix B.

Encouraging pet owners to adhere to proper pet waste management helps to reduce bacteria contributions, either directly into the harbor waters or through runoff, attributed to pet waste.

5.1.1.5 Feral Cat Abatement – County

The County's Harbor Department works with the Greyfoot Cat Rescue to remove feral cats from the area, keeping the population to a manageable level but allowing a limited number of cats to remain to aid in rodent control.

Approximately 12-15 feral cats are captured, neutered, and removed from the beach annually to maintain a low feral cat population at the beaches; 19 were removed in 2015. Maintaining a limited population of feral cats near the beaches reduces bacterial contributions from cat waste to the harbor waters, and discouraging beach visitors and neighborhood residents from feeding feral cats aids in maintaining a low cat population.

5.1.1.6 Fish Waste Disposal Ordinance and Enforcement – County

The majority of fish waste is disposed of properly, but the TMDL staff report identified fish waste discharged directly into harbor waters or in nearby trashcans (CRWQCB, 2007). County's Harbor Department's Ordinance No. 6402(f) is in place to prohibit discharge of waste or dead fish at the marine or shore area. Fish waste that is dumped in the harbor waters or improperly disposed of in the harbor area could attract birds, therefore it is expected that eliminating fish waste reduces bacterial contributions from bird waste. The Standard enforcement by the Harbor Patrol include 1) verbal warning, 2) written warning, and 3) written citation tickets. There was one written citation by Harbor Patrol Officer given in October 2013 for VC06406-9.2 live bait.

5.1.1.7 Bathroom Maintenance – County and City

The QMRA study found evidence of diffuse human fecal pollution at both beaches. To discourage beach visitors from utilizing the beach waters as a bathroom, the nearby public bathroom facility is maintained daily by the City of Oxnard's Department of Parks.

Maintenance of a clean and accessible bathroom facility reduces swimmer contributions as a source of fecal indicator bacteria at the beaches.

5.1.1.8 Code and Ordinance Review Program – County and City

The County's Stormwater Ordinance 4142 was amended in July 2012 to include prohibitions of non-stormwater discharges into the County storm drain system and progressive enforcement provisions as required by the NPDES MS4 Permit.

- Article 2 - Prohibition of non-stormwater discharges to the County storm drain systems or receiving waters.
- Article 4 - No discharge of litter/trash to the County storm drain system or receiving waters.

The City's Stormwater Ordinance 2876 adopted in 2013 was amended to include enforcement methods to prohibit illicit discharges (notice of violation, fine, time schedule order, cease and desist order, cost recovery for cleanup, administrative complaint/fine, or referral to the district attorney) into the City storm drains or receiving waters.

In order to more effectively enforce stormwater ordinances, progressive enforcement including civil penalties are included in both Stormwater Ordinances. These enhanced provisions discourage people from violating stormwater ordinances and are likely reducing pollutant contributions entering the harbor, either directly or through runoff, generated from human activity.

5.1.1.9 Beach Grooming – County

To improve the cleanliness of the beaches and reduce the amount of trash/debris possibly contaminating the harbor waters, a beach cleaner is used to dispose of debris present in the sand. In 2013, the County purchased new beach grooming equipment for \$134,515 including the tractor (\$81,141) and beach cleaner attachment (\$53,374). Photographs of the new beach cleaner and tractor, and Kiddie Beach post grooming, are included in Appendix B. A tractor pulling a rake was used by the County Harbor Department for beach cleaning at Kiddie Beach⁷ beginning October, 2013. Kiddie Beach is groomed weekly, although the tide height, amount of visitors on the beach, and availability of an equipment operator determines if beach grooming is feasible on any given week.

⁷ Hobie beach is mainly rocks and is therefore not suited for grooming.

5.1.1.10 Catch Basin Monitoring and Maintenance – City and County

Both City and County own and maintain catch basins within the TMDL drainage area. All City and County's catch basins are subject to NPDES Municipal Stormwater Permit's requirements for inspection and cleanouts on frequencies based on prioritization of high, medium, and low trash generating areas.

The City owns and maintains two catch basins located on the east and west sides of Victoria Avenue that discharge into the harbor at Hobie Beach. The drainage area for these two catch basins is comprised of four streets with residential housing on the east side of Victoria Ave and the U.S. Coast Guard Facility on the west Side. The Channel Islands Beach Communities Service District (CIBCSO) allows residential landscape irrigation on Mondays and Thursdays; however, most of the homes in this area do not have front lawns, resulting in very little irrigation runoff (if any) to these catch basins.

City catch basins were previously inspected annually, at a minimum, by the Oxnard City Corps and were cleaned if more than 25 percent full. The catch basins for the inlets to the storm drain that discharges at Hobie Beach are "Priority C" basins, meaning they are low priority and typically less than 20 percent full of trash. Cleaning has historically not been needed (i.e., the catch basins are typically less than 25 percent full), but the City had planned to increase inspections to once per quarter and clean as needed.

In an effort to determine if dry weather flow is impacting the water quality at Hobie Beach, the City met with VCWPD, VCEHD, and Ocean Water Quality Monitoring Program (OWQMP) to coordinate a program to monitor dry weather flow at catch basins. A plan was developed whereby the City conducts weekly catch basin inspections each Tuesday when OWQMP conducts AB411 water quality monitoring at Hobie Beach. The City developed an inspection worksheet to document the presence of dry weather runoff, water in the catch basins, tidal conditions, trash/floating, and any other relevant observations. In addition, OWQMP agreed to notify the City if any dry weather runoff was observed during weekly sampling activities at Hobie Beach. Any exceedances of state ocean water quality standards would also be noted.

Since monitoring efforts began in June 2016, no dry weather runoff has been observed and no state ocean water quality standards have been exceeded at Hobie Beach. At each monitoring event, photographs are taken upstream and downstream of each catch basin to provide evidence that no dry weather flow was present. Photos are also taken of the inside of the catch basins to document the presence of water, floating, and kelp. Water is often present in both catch basins; however, it appears to be the result of tidal influence as the depth of water in the catch basins directly correlates with tidal conditions at the

time of monitoring (based on visual observations). Additionally, VCWPD staff have measured the salinity of water in the catch basins and compared it to the salinity of the water in the harbor and found that they were similar. Additional details and an example field sheet are included in Appendix B.

5.1.1.11 Street Sweeping - City

Street sweeping conducted by the City occurs twice per month, or more frequently, as necessary. This removes possible sources of contamination from the streets, preventing these sources from being transported to the beaches and negatively affecting water quality.

5.1.1.12 Trash Management - City

The QMRA (SCCWRP, 2013) identified pelicans, gulls, and pigeons as possible sources of indicator bacteria and fecal wastes at the beaches. Trash containers were replaced with bird resistant receptacles that are emptied daily by the City (examples are shown in Appendix B). This measure both reduces the bird population, reducing fecal waste from the birds, and decreases the amount of trash that is removed from trash cans and eventually transported into harbor waters.

5.1.2 Pilot Studies and Structural Controls

5.1.2.1 Bird Control Measures - County

The QMRA (SCCWRP, 2013) identified pelicans, gulls, and pigeons as possible sources of indicator bacteria and fecal wastes at the beaches. Efforts to reduce bird populations are currently in place, such as discouraging feedings by the public, trash controls, and reducing fish waste in the area. To accompany these efforts, prior to the TMDL, the County Harbor Department tested several bird control measures at the CIH beaches. These efforts included the following:

- Clothesline stands with metallic streamers (“scarecrows”)
- Bird resistant refuse containers (examples shown in Appendix B)
- Increased frequency of beach clean-up
- Installment of wire rotors on the sea wall
- Installment of the “BirdXpellar”, a device that admits periodic raptor calls

Bird filaments are another potential deterrent that could be used at the beaches, however considerations related to protection of special status species (e.g., brown pelican) restrict their potential use. Other Southern California beaches have used dogs and falcons with

mixed success. At this time, the County is focusing its efforts on human and storm drain related sources of bacteria, and therefore is not planning to pursue these options.

5.1.2.2 Mobile High Pressure Flushing - County

A lack of circulation in the shallow surf zones at the beaches may contribute to an environment that is able to support elevated levels of bacteria. Therefore, a high pressure water hose was proposed by the County Harbor Department to encourage circulation and mixing in the shallow beach areas. This technique was conducted as an experiment. The Harbor Department staff used a high pressure hose on two separate dates and found it to be unproductive for enhancing local water circulation at the Harbor Beaches.

5.1.2.3 Pilot Enhanced Circulation Devices - County

A sample conducted at the beaches in 2000 showed that elevated levels of indicator bacteria were only found in samples collected from the surf zone (LWA, 2001). Observations during a dye study at Kiddie Beach noted that there was limited circulation near the beach areas, as dye placed in the surf stayed concentrated within 25 feet of the surf line (LWA, 2001).

Poor circulation in the surf zone creates an environment able to support high bacteria densities. The design of the harbor and inclusion of the surge wall isolate these beach areas from the general circulation in the harbor. Dry weather bacteria exceedances can likely be attributed to local sources, so it is expected that improvements to circulation near the beaches will also improve water quality. No additional circulation studies have been conducted, and circulation devices have not been implemented.

5.2 Wet Weather IP Recommended BMPs

5.2.1 Institutional BMPs

5.2.1.1 Downspout Disconnect Program - County

The Wet Weather IP recommended implementation of a downspout disconnect program to reduce wet weather stormwater discharges to the Harbor. In 2012, the County performed a feasibility assessment of a downspout disconnect program. It was found that due to a lack of roof gutters, small setbacks and minimal landscaping area, implementation of a downspout disconnect program is infeasible and would provide very minimal benefits (the findings are summarized in Appendix B). Therefore, alternatives

have been implemented in County tier 1⁸ areas. The Greens Gardens Group (G³), in coordination with the County, prepared a “Downspout Redirect” workshop brochure and hosted an Ocean Friendly Gardens class on June 14, 2013 (Appendix B). The brochure provides general information, using language intended for the average homeowner, on downspouts redirected to rain barrels, permeable paving, and sponge (rain) gardens, while the classroom seminar taught local residents techniques to install these systems. This program is anticipated to contribute to a reduction in wet weather runoff and bacteria loads from County residential areas to the Harbor.

5.2.1.2 Pet Ownership Outreach and Enforcement Programs - County

Several actions have been taken by the County to reduce domesticated dogs as a potential source of contamination. 3,400 flyers educating on pet waste disposal were mailed to all beach residents and boat slip tenants in February 2011 and May 2014. These flyers are also available at public counters and retail areas throughout the Harbor area. A “Watershed Protection Tips for Pet Owners” brochure was developed by the Countywide Stormwater Program and 5,000 copies were made for distribution. In 2014, the County updated the brochure and redistributed it. A pet waste flyer was also developed for the County Harbor Department to educate the public on why it is important to properly dispose of pet waste. Another bacteria pollution prevention brochure in both English and Spanish, “4 Simple Habits to Reduce Watershed Pollution” or “4 Simples Consejos Para Reducir La Contaminacion de Cuenca Hidrograficas”, has been recently completed, and 2,400 copies will be distributed with utility bills in December 2016. These materials are included in Appendix B.

5.2.1.3 Catch Basin Cleaning - County

A catch basin cleaning program is currently in place through the MS4 NPDES permit. Catch basins have been classified into three priority groups based on the volume of trash generated, and inspections are performed according to priority group. County catch basins are cleaned as needed based on inspection or whenever they are more than 25 percent full. The County’s catch basins draining to the Harbor beaches collect sand and very little trash. Continued inspections and clean outs of the catch basins contribute to water quality improvement in MS4 wet weather discharges to the Harbor.

⁸ A “tier 1” implementation area was identified for the Wet Weather IP to characterize the estimated area that is directly tributary to the Harbor south of Channel Islands Boulevard.

5.2.2 Structural BMPs

The wet weather IP identified Harbor redevelopment projects that would result in new structural stormwater controls consistent with MS4 requirements for onsite retention and/or treatment of stormwater. Only a single redevelopment project, a boat launch ramp replacement, has been completed with structural BMPs since the submission of the wet weather IP (Figure 5). The project, completed in June 2014, is located on the east channel of the Channel Islands Harbor, west of Victoria Avenue and just north of Curlew Way. Two bioswales and two large Contech stormwater cartridge filtration vaults were constructed to treat runoff from approximately 3.5 acres of impervious area prior to discharge to the Harbor. The filtration vaults are designed to remove 80 percent of particulates that are 50 microns or larger at a water quality flow rate of 0.48 and 0.6 cubic feet per second.

5.2.3 Storm Drain Outfall Monitoring Program – County

The Wet Weather IP identified storm drain outfall monitoring as an important activity to help prioritize outfalls for possible treatment retrofit projects. The concept was developed and applied for funding under the Clean Beaches Initiative Grant Program in August 2013; however, funding has not been awarded. After discussions with the State Water Resources Control Board Financial Assistance Program (Clean Beaches Initiative) staff, it was recognized that due to on-going improvements, the project schedule may be inappropriate to meet the funding program goals. Also, an invitation for resubmittal suggested focusing on dry weather only. The County submitted another grant application in July 2014 but it was not selected for funding.

5.3 Additional BMPs (Not Identified in IPs)

Additional BMPs were identified for implementation based on findings from the QMRA study.

5.3.1 Sewer Line Replacement – Channel Island Beach Community Services District

The sewer system within Silver Strand community and its vicinity is operated by CIBCSO. A sewer replacement project implemented in 2014 involved the replacement of 8,500 linear feet of cured in place pipe (CIPP) and 1,200 linear feet of open trench pipe (9,700 linear feet total), including a section that runs along Victoria Avenue parallel to Kiddie and Hobie Beaches on the east side of the street (see Figure 5). The pipeline was installed in 1966 and had experienced several failures throughout the years. Observation

during the most recent failure in 2003 indicated that the pipe was near the end of its useful life.

The CIBCSO's capital improvement project began on July 22, 2014, and newly rehabilitated force mains near the beaches that were placed back in service around October 22, 2014. Replacement of these sewer lines reduces the chance that sewage will leak from the sewer system and travel to the harbor or storm drains through the subsurface.

5.3.2 Storm Drain Outfall – County and City

A storm drain outfall on Hobie Beach is owned and operated by the City, and receives surface runoff from two catch basins on S. Victoria Ave. During the 2012 SCCWRP study, the outfall discharged very high *Enterococcus* concentrations, and a concentration gradient was observed in the surf zone downstream of the outfall. However, no surface runoff entered the storm drain, and the high *Enterococcus* concentrations were caused by growth in the storm drain and tidal flushing. The County and the City agreed to collaborate on the drain outfall retrofit project to eliminate dry weather indicator bacteria inputs to Hobie Beach. The City is planning to install a Tideflex valve (<http://www.tideflex.com/tf/index.php>) on the outfall to reduce backwater ponding and bacteria regrowth in the storm drain.

5.3.3 Dry Weather Diversion – VCWPD

The San Nicholas Pump Station (Pump Station) was installed by VCWPD in 1986 and since then has been operated for flood control purposes. As a result of stakeholder efforts to improve water quality of the Harbor Beaches, VCWPD temporarily diverted dry weather flows from the Pump Station to the City's Wastewater Treatment Plant for treatment from October 1999 to October 2000, resulting in lower total and fecal coliform concentrations at Kiddie Beach. A permanent diversion structure was then installed in 2003. From 2003 to October 2014, the sewer diversion pump was active during the summer dry periods (April 15 through September 30) with periodic disturbances due to operational issues or weather (i.e., the diversion pump was switched off before forecasted storms during the summer). In April 2015, the diversion pump was switched to operate year-round during dry weather, and was manually turned on/off by VCWPD personnel based on storm forecasts and recorded amounts of rain (TMDL defined wet weather as 0.1 inches of rain or more plus the three days following the rain event). This change to year-round operation was expected to result in further reduction of dry weather bacteria exceedances at Kiddie Beach.

Based on VCWPD's existing Supervisory Control and Data Acquisition (SCADA) system, between June 2015 (when the diversion pumping information was incorporated into the SCADA system) and October 2016, a total of 8,383,652 gallons were diverted to the sanitary sewer system from the Pump Station (details are included in Appendix B).

In April 2016, VCWPD staff updated the diversion pump system by installing a new stand pipe rain gage on the roof outfitted with a Hydrolynx 50386 ALERT2 Transmitter in order to automate the operations based on actual rainfall. The rain gage and transmitter were then programmed to turn the sewer diversion pump "off" and turn the sump pump that discharges to the harbor "on" when 0.1 inches of rainfall is received on the rooftop rain gage. After 72 consecutive hours of no additional rainfall, the sump pump will turn "off" and the sewer diversion pump will turn back "on" and resume regular operation of diverting all flows into the pump station to the sanitary sewer system.

On June 16, 2016, VCWPD staff performed a dye test within the two storm drains draining to the Pump Station. The purpose of this dye test was to confirm that both the Pump Station and sewer diversion pump were working correctly and that valve/infrastructure leaks or other issues were not causing dry weather runoff collected at the Pump Station to discharge to the CIH adjacent to Kiddie beach (instead of being diverted to the sanitary sewer system).

Two locations within the storm drain system were identified as being ideal for discharging the dye upstream from the Pump Station (shown in Appendix B). Location #1 was the closest upstream manhole, where approximately 95 percent of the total 31 acres drains through this location via a 36-inch reinforced concrete pipe (RCP). Location #2 was within a catch basin that ties into an 18-inch RCP draining directly to the Pump Station, and this location represents the remaining five percent of the drainage area to the Pump Station.

Notification of the dye test was given one to two weeks prior to the study to all appropriate organizations, which included the Ventura County Harbor Department, CIBCSD, VCEHD, Ventura County Transportation Department, VCWPD Operations and Maintenance Division, and California State Lifeguards. Three dye test notification signs were placed along Kiddie Beach prior to starting the procedure. The low tide period on June 16, 2016 (1.8 feet at 1:29 p.m.) was selected as the date for the dye test to increase the likelihood of observing dye flowing from the outfall. The dye test was executed using the following procedure (a schematic of the Pump Station is included in Appendix B):

- 12:50 p.m.: one gallon of the dye liquid (Cole Parmer Yellow/Green Tracing Dye) was poured into the Location #1 "Parking Lot" storm drain manhole.

Simultaneously, O&M staff hosed approximately 150 gallons of water from the water truck into the manhole. Dye was observed in the containment vault at the Pump House at 12:54 p.m., transported by the 36-inch RCP.

- 1:00 p.m.: one gallon of the liquid dye was poured into the Location #2 west side catch basin on San Nicholas. Approximately 100 gallons of water from the water truck was flushed into the catch basin. The dye was immediately observed entering the containment vault through the 18-inch RCP outfall.
- 1:04 p.m.: the Pump Station storm drain to sewer automatic diversion pump was turned on. The water level within the vault at this time was approximately 64 inches. The storm drain diversion pump is programmed to turn on when the water level within the vault reaches 48 inches and remain on until the water is drawn down to approximately 18 inches. The pump functioned properly and immediately kicked on. The dye was observed being pumped into the Sewer manhole adjacent to the pump house.
- 3:00 p.m.: CIBCSO staff remained on site until approximately 3:00 p.m. to visually monitor Kiddie Beach for the presence of dye. Dye was not observed within the waters at Kiddie Beach or exiting the Pump Station's main pump outfall locations throughout the test.

On June 17, 2016 at approximately 9:00 a.m., a follow-up dye monitoring inspection was conducted at Kiddie Beach by CIBCSO staff. Dye was not observed at the beach. Throughout the entire study, dye was not detected within the Kiddie Beach area or the Pump Station Main Pump outfalls while the sewer diversion pump was operating per normal operating conditions. Therefore, it was confirmed that all dry weather flows are being successfully diverted to the sanitary sewer system, with no discharge of dry weather flows to the Kiddie Beach/Channel Islands Harbor area. Photographs from the dye study are included in Appendix B.

5.3.4 Parking Lot Drain Removal – County

Improvements to parking lot drainage have recently been implemented, and these improvements have aided in preventing dry and wet weather flows originating at the Kiddie Beach parking lot from reaching the beach. No direct runoff from the parking lot of Kiddie Beach is discharged onto the beach sand. The elimination of stormwater runoff from these parking areas reduces bacteria contributions to the beach during wet weather.

5.3.5 Marina Facilities – County

The County Harbor Department prohibits septic and other illicit discharges from boats, and pump-out facilities are located in the harbor to encourage the public to pump their

septic and holding tanks instead of discharging into harbor waters. Dye tablets are also distributed to boaters to reveal if boat holding tanks are being emptied into the harbor waters.

The County Harbor Marinas were certified as a Clean Marinas by the Clean Marina California Program on February 22, 2006 and recertified as Clean Marinas on June 8, 2016. Four sewage pump-out facilities and a bilge pump-out facility are maintained monthly to help prevent pollutant loading in the Harbor. Maintaining strict regulation at the marina limits the illegal discharges that could contribute bacteria directly to the harbor waters.

5.3.6 Ordinances

Many sources of bacterial loads contributing to the pollution at the beaches are associated with human activity. The County and City have established numerous ordinances to regulate the behavior of the public to help reduce pollutants entering the harbor waters. In addition, the CIBCSO adopted Ordinance No. 75 to establish water conservation and water supply shortage program and regulations including water use restrictions, which aid reduction of urban runoff and nuisance flows within the beach community.

- County Ordinance No. 4450 – No discharge of pollutants, bacteria, or trash into County storm drains.
- City Ordinance No. 2876 – The discharge of pollutants into the storm drain system is prohibited.
- Harbor Ordinance 6408 – No deposition of refuse, trash, sewage, or waste matter in water of harbor or outer harbor.
- City Ordinance No. 2876 - No person may throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, kept, or maintained, in or upon any public or private driveway, parking area, street, alley, sidewalk, trail, or component of the storm drain system or any receiving waters, any refuse, rubbish, garbage, litter, or other discarded or abandoned objects, articles, accumulations, or pollutant so that the same may cause or contribute to pollution.
- County Parks Ordinance No. 6408-3 – Trash must be placed in trash receptacles.
- Parks Ordinance 6306-3 – No removal of objects from trash receptacles; and rubbish must be placed in specified locations.
- CIBCSO Water Conservation Ordinance 75 - In accordance with water conservation efforts, residents are prohibited from hosing down hard/paved surfaces or generating runoff from landscape areas onto hard surfaces/pavement. Residents must also use a hose equipped with a self-closing spray nozzle when washing vehicles.

Enforcement of these ordinances are likely reducing pollutant contributions entering the harbor, either directly or through runoff, generated from human activity.

6. COMPLIANCE DISCUSSION

6.1 Dry Weather Compliance

The dry weather monitoring results from 2009 to 2014 show no exceedances of the single sample interim WLAs required by the TMDL. Also there were no dry weather single sample or geometric mean final WLA exceedances at Hobie Beach. However, there were dry weather single sample or geometric mean final WLA exceedances at Kiddie Beach. Dry weather sampling events that exceeded single sample or geometric mean water quality objectives are summarized in Table 8, along with important comments.

Although final WLAs were exceeded at Kiddie Beach during dry weather, dry weather BMPs have been implemented to eliminate dry weather flows. Additionally, studies have been conducted to demonstrate that the County and City's local MS4 outfalls are not contributing dry weather flows to the Harbor Beaches and therefore are not causing or contributing to the exceedances measured at the Harbor Beaches during dry weather.

These dry weather BMPs and studies include:

- Setting the San Nicholas Pump Station diversion pump to operate during year-round dry weather starting in April 2015. In addition, the diversion pump was recently upgraded to operate based on actual rainfall at a site-specific rain gage, starting in April 2016. In June 2016, a dye test was also performed at the San Nicholas Pump Station that confirmed that all dry weather flows were being diverted to the sanitary sewer system and were not discharging to the Kiddie Beach area.
- Inspecting the catch basins that discharge into Hobie Beach on a weekly basis for dry weather flow. No dry weather runoff has been observed by the City since this program began in June 2016.

Since the sewer line replacement in October 2014, only one out of eight samples at Kiddie Beach that were analyzed in the MST study had a human marker detection. This shows significant improvement relative to the frequent rate of detection, as determined by SCCWRP in 2014/2015, prior to the sewer repair. It is also important to note that Heal the Bay's Beach Report Cards from 2014 to 2016 rated the Harbor beaches favorably for dry weather, awarding Hobie Beach and Kiddie Beach an "A" grade four times and a "B" grade once during this period. These grades are significant improvements from prior to the TMDL, when Hobie Beach received a grade of "F" for the years 2000 to 2003 and Kiddie Beach received a grade of "F" for the years 2000, 2001, 2002, and 2004.

Table 8. Dry Weather Exceedance Days at Kiddie Beach (after December 18, 2013)

Date	Season	Single Sample Exceedances			Geometric Mean Exceedances ¹		Important Comments	
		Fecal Coliforms (MPN/ 100 mL)	Enterococcus (MPN/ 100mL)	Total Coliform (MPN/ 100mL)	Enterococcus (MPN/ 100mL)	Total Coliform (MPN/ 100mL)		
TMDL Threshold		400	104	10,000	35	1,000		
1/27/14	Winter Dry		364				Forcemain Undergoing Rehabilitation	
2/18/14			344				Forcemain Undergoing Rehabilitation	
2/24/14					41		Forcemain Undergoing Rehabilitation	
3/17/14			831		89		Forcemain Undergoing Rehabilitation	
3/24/14					36		Forcemain Undergoing Rehabilitation	
12/8/14			165	11,199	66		Dredging between 10/14/2014 and 1/24/2015	
12/22/14			124		70	1,925	Dredging between 10/14/2014 and 1/24/2015	
12/29/14					55	1,355	Dredging between 10/14/2014 and 1/24/2015	
1/5/15					38	1,055	Dredging between 10/14/2014 and 1/24/2015	
1/20/15			364		90		Dredging between 10/14/2014 and 1/24/2015	
1/26/15					81			
2/2/15					71			
2/17/15					41			
11/17/15				531				All year dry weather Diversion Pump Operation started in April 2015
1/4/16				306				Diversion Pump Operating

Date	Season	Single Sample Exceedances			Geometric Mean Exceedances ¹		Important Comments
		Fecal Coliforms (MPN/ 100 mL)	Enterococcus (MPN/ 100mL)	Total Coliform (MPN/ 100mL)	Enterococcus (MPN/ 100mL)	Total Coliform (MPN/ 100mL)	
TMDL Threshold		400	104	10,000	35	1,000	
3/28/16					44		Diversion Pump Operating
4/1/14	Summer Dry		344				Diversion Pump Operating; Forcemain Undergoing Rehabilitation; Follow-up sample did not exceed
4/15/14			750				Diversion Pump Operating; Forcemain Undergoing Rehabilitation; Follow-up sample did not exceed
10/21/14		703	659				Diversion Pump Operating; Forcemain Undergoing Rehabilitation; Dredging between 10/14/2014 and 1/24/2015
10/22/14 ²		624	738		42		Diversion Pump Operating; Dredging between 10/14/2014 and 1/24/2015
10/28/14					45		Diversion Pump Operating; Dredging between 10/14/2014 and 1/24/2015

1. There were no geometric mean exceedances of the water quality objective for fecal coliforms.

2. This was a follow-up sample.

6.2 Wet Weather Compliance

While the wet weather single sample final WLAs are not effective until December 18, 2018, the wet weather monitoring results from 2009 to 2016 show that no exceedances of the interim WLAs occurred for both Hobie Beach and Kiddie Beach, except for interim

WLAs at Kiddie Beach in TMDL year 2011. It is also important to note that 2011 and 2015 were the only TMDL years where exceedance days would have exceeded the wet weather single sample final WLAs. However, the recent drought, which has resulted in fewer wet days over the past several years, could have partially contributed to this.

The winter and summer geometric mean targets became effective on December 18, 2013 and there were no exceedances greater than the geometric mean targets at Hobie Beach on wet weather days. However, there were exceedances greater than the final geometric mean targets at Kiddie Beach during wet weather, and these exceedance days are summarized in Table 9.

With the ongoing implementation of the BMPs defined in the Wet Weather IP, it is expected that the water quality during wet weather will improve and the number of wet weather exceedance days will continue to decrease. This water quality improvement is supported by recent wet weather monitoring results that suggest a significant improvement in beach water quality since the TMDL became effective. Based on the period of record used in the TMDL (April 1999 - March 2006), AB411 monitoring data indicated that Kiddie and Hobie Beaches exceeded single sample water quality objectives 51 percent and 43 percent of the time, respectively, during wet weather. However, since the TMDL effective date (February 2009 – October 2016), wet weather exceedance percentages were 29 percent and 26 percent at Kiddie and Hobie Beaches, respectively, indicating significant water quality improvement since the TMDL. To further guide wet weather implementation planning, the City and County are considering MST sampling at the Harbor Beaches and the MS4s during wet weather to identify and eliminate (if present) human fecal sources.

Heal the Bay also awarded high grades for the Harbor Beaches during wet weather. Hobie Beach and Kiddie Beach were given two “A” grades and two “C” grades for wet weather for 2014 to 2016. Again this is an improvement over the pre-TMDL condition, in which Hobie Beach received an “F” grade from 2000 to 2003 and Kiddie Beach received an “F” grade from 2000 to 2007 (excluding 2006).

Table 9. Wet Weather Exceedance Days at Kiddie Beach (after December 18, 2013)

Date	Season	Single Sample Exceedances			Geometric Mean Exceedances ¹	
		Fecal Coliforms (MPN/ 100 mL)	Enterococcus (MPN/ 100mL)	Total Coliform (MPN/ 100mL)	Enterococcus (MPN/ 100mL)	Total Coliform (MPN/ 100mL)
TMDL Threshold		400	104	10,000	35	1,000
12/1/14	Wet ²				47	
12/15/14					53	1,454
1/12/15					44	1,231
2/9/15					82	

1. There were no geometric mean exceedances of the water quality objective for fecal coliforms.
2. Exceedances during wet weather are only listed for exceedances of the geometric mean, since single sample final WLAs for wet weather are not yet effective.

7. CONCLUSION

The City, County, and VCWPD have implemented numerous dry and wet weather BMPs to comply with the TMDL requirements, including modification to the low flow diversion (to extend operation into winter dry weather) and repair of a nearby sewer line. As a result, dry weather indicator bacteria concentrations and human marker detections rates have fallen. In addition, a dye test of the low flow diversion and regular inspections have demonstrated that dry weather flows are not occurring at the MS4 outfalls. Therefore, local MS4s are not causing or contributing to the few remaining dry weather WLA exceedances that are observed at the Harbor beaches. To confirm the absence of human markers, additional human marker sampling is needed at both Hobie and Kiddie Beaches.

Although wet weather final WLAs are not effective yet, the City, VCWPD, and County have also made progress towards consistently meeting them. To further improve water quality and prioritize the elimination of human fecal bacteria, the City, VCWPD, and County are considering MST investigations during wet weather as well.

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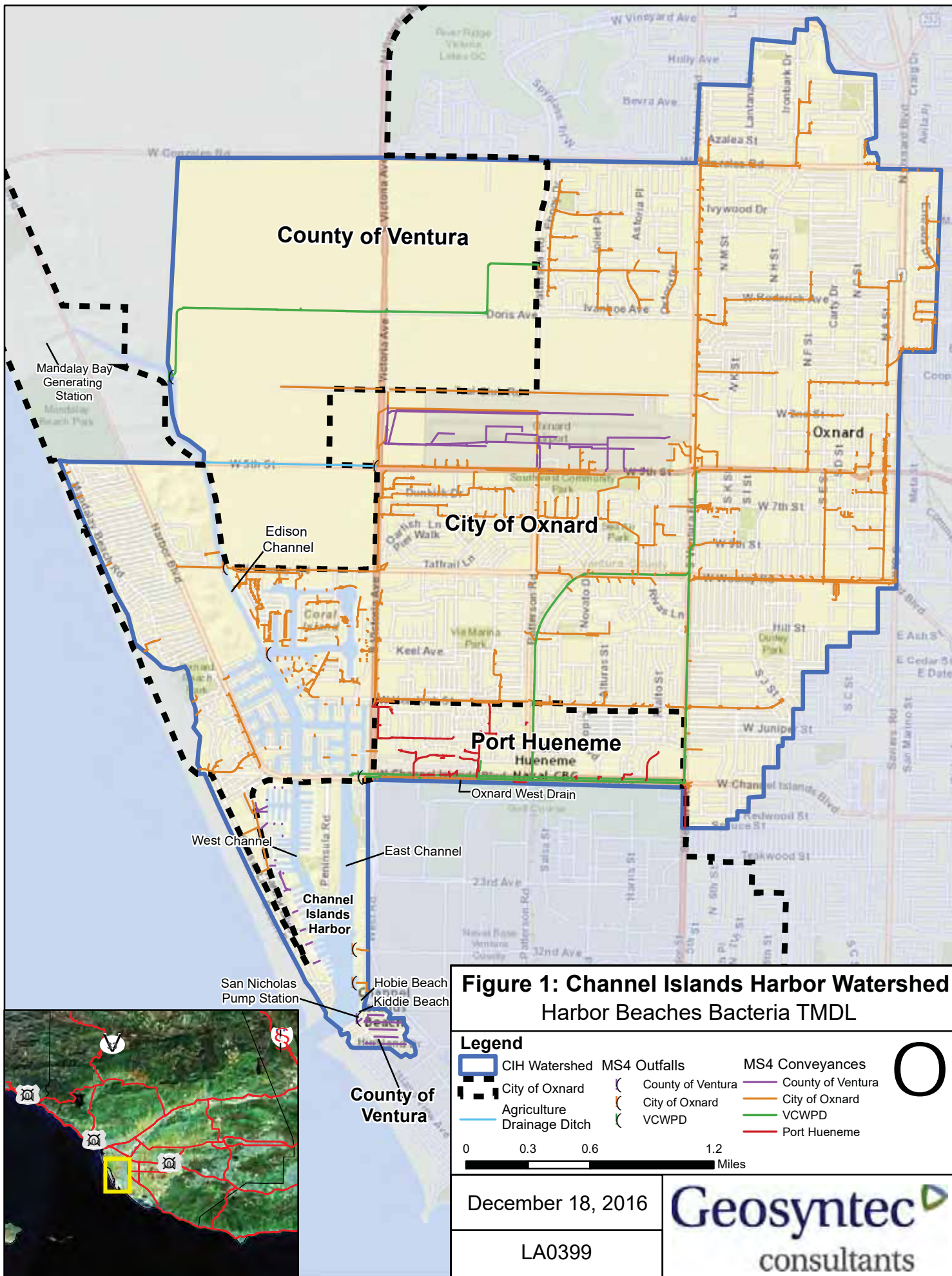
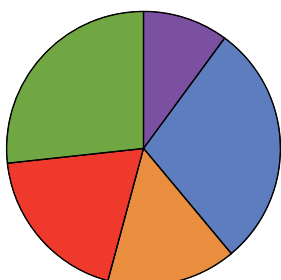




Figure 2: County MS4 and Land Use
Harbor Beaches Bacteria TMDL

County Land Uses in CIH Watershed



- Commercial (10.1%)
- Marina Water Facilities (28.8%)
- Multi-family Residential (15.3%)
- Single-family Residential (19.1%)
- Parks and Recreation (26.7%)

Legend

- CIH Watershed
- City of Oxnard

MS4 Conveyances

- County of Ventura
- VCWPD

Land Use

- Parks and Recreation
- Marina Water Facilities
- Commercial
- Multi-family Residential
- Single-family Residential

0 500 1,000 2,000 Feet

December 18, 2016

LA0399

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consultants

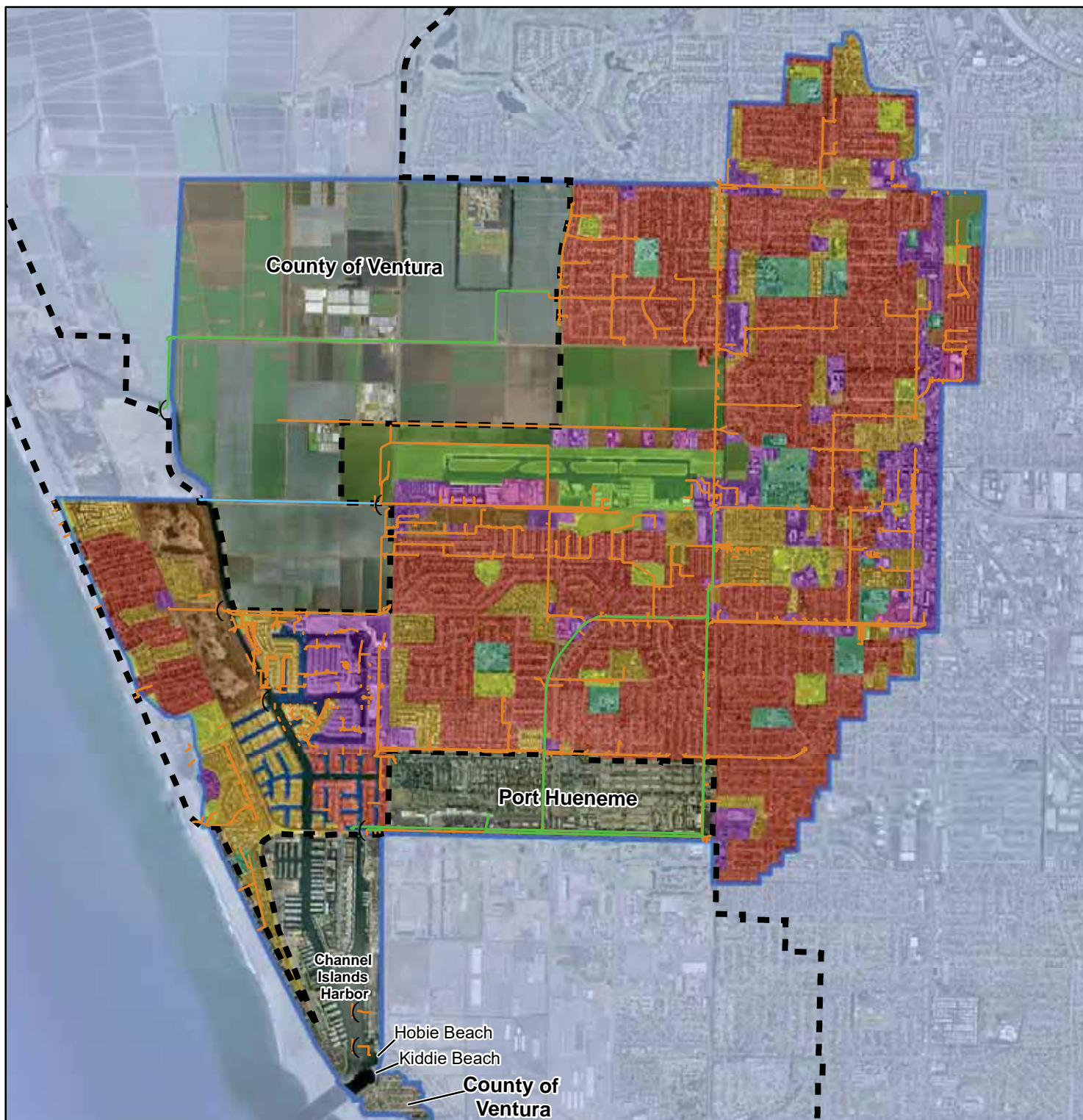
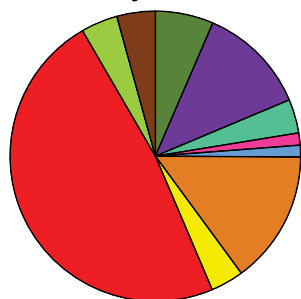


Figure 3: City MS4 and Land Use
Harbor Beaches Bacteria TMDL

City Land Uses in CIH Watershed



- Agriculture (6.5%)
- Commercial (12.2%)
- Education (3.8%)
- Industrial (1.4%)
- Marina Water Facilities (1.3%)
- Multi-family Residential (14.8%)
- Parks and Recreation (3.7%)
- Single-family Residential (48.0%)
- Transportation (4.1%)
- Vacant (4.3%)

Legend

- CIH Watershed
- City of Oxnard
- MS4 Outfalls
 - City of Oxnard
 - VCWPD
- Agriculture
- Drainage Ditch
- MS4 Conveyances
 - City of Oxnard
 - VCWPD

- Land Use
 - Agriculture
 - Commercial
 - Transportation
 - Parks and Recreation
 - Multi-family Residential
 - Single-family Residential
 - Marina Water Facilities
 - Education
 - Industrial
 - Vacant

0 0.325 0.65 1.3 Miles

December 18, 2016

LA0399

Geosyntec
consultants



Figure 4: QMRA Monitoring Locations
Harbor Beaches Bacteria TMDL

Legend

CIH Watershed

QMRA Monitoring Locations

— Wastewater Gravity Sewer

— Wastewater Force Main

MS4 Conveyances

— County of Ventura

— City of Oxnard

MS4 Outfalls

{ County of Ventura

{ City of Oxnard

0 275 550 1,100 Feet

December 18, 2016

LA0399

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consultants



Figure 5: Locations of Key BMP Implementation
Harbor Beaches Bacteria TMDL

Legend

- CIH Watershed
- Boat Launch Ramp Redevelopment Project

MS4 Outfalls

- (County of Ventura
- (City of Oxnard

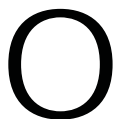
- Wastewater Gravity Sewer

- Wastewater Force Main

MS4 Conveyances

- County of Ventura
- City of Oxnard

0 450 900 1,800 Feet



December 18, 2016

LA0399

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Appendix A

Draft CIH Bacteria TMDL Data Analysis Report

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1. INTRODUCTION

1.1 Background

The Harbor Beaches of Ventura County, or Kiddie Beach and Hobie Beach, located within the Channel Island Harbor (CIH), are included on the California 303(d) list for bacteria. To address this, a Total Maximum Daily Load (TMDL) was developed for the CIH beaches. The TMDL, an amendment to the Water Quality Control Plan for the Los Angeles Region (Basin Plan), became effective on December 18, 2008 (Resolution R2007-017). The TMDL Basin Plan Amendment contains numeric limits based on REC-1¹ bacteriological water quality objectives for marine water. The allowable pollutant loadings under the TMDL, or waste load allocations (WLAs), are expressed as an allowable number of days per year that the water quality objectives can be exceeded. The TMDL single sample interim and final WLAs were included in the 2009 Ventura County MS4 Permit, for three seasons: (1) summer dry weather (April 1 to October 31), (2) winter dry weather (November 1 to March 31), and (3) wet weather days (defined as days of 0.1 inches of rain or more plus the three days following the rain event). The geometric mean WLAs listed in the TMDL Basin Plan Amendment are not incorporated into the Ventura County MS4 permit. The Amendment required submittal of a Compliance Report by December 18, 2014 (six years after the effective date of the TMDL), that summarized monitoring results relative to TMDL WLAs and implemented activities to improve water quality at the beaches. Two reports were submitted on December 18, 2014 to fulfill this requirement, one for the City of Oxnard (Geosyntec Consultants, 2014a) and one for the County of Ventura Public Works Agency and the Ventura County Watershed Protection District (Geosyntec Consultants 2014b). The Amendment requires an additional Compliance Report to be submitted by December 18, 2016 (eight years after the effective date of the TMDL).

The TMDL was developed based on a reference system/antidegradation approach. Therefore, the allowable number of exceedance days for each monitoring site are based on the more stringent of two criteria: (1) exceedance days in the designated reference system (Leo Carrillo Beach), or (2) exceedance days based on historical bacteriological data at the monitoring site (1999-2006). This ensures that bacteriological water quality is at least as good as that of a largely undeveloped system and that there is no degradation of existing water quality. In the case of the CIH beaches the number of exceedance days at the reference beach was the more stringent criteria (LARWQCB 2007).

¹ The REC-1 beneficial use category covers uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs. (LARWQCB 1994)

This report presents results from a data analysis performed on the weekly monitoring data for indicator bacteria at the CIH beaches for the TMDL WLAs for which compliance dates have passed; these include the interim and final summer and winter dry weather single sample WLAs, the interim wet weather single sample WLA, and the interim and final geometric mean WLAs. The weekly monitoring data for indicator bacteria at the CIH Beaches were compared with the REC-1 single sample and geometric mean objectives. An exceedance day was counted when any indicator bacteria density exceeded the single sample objective or the rolling 30-day geometric mean objective. Exceedance days were then compared to the interim and final allowable exceedance days for each season.

1.2 **Data Analysis Objectives**

The following single sample water quality objectives for waters designated REC-1 are referenced in the TMDL:

- a. Total coliform density shall not exceed 10,000 MPN/100 mL.
- b. Fecal coliform density shall not exceed 400 MPN/100 mL.
- c. Enterococcus density shall not exceed 104 MPN/100 mL.
- d. If the ratio of fecal-to-total coliform exceeds 0.1, total coliform density shall not exceed 1,000 MPN/100mL.

The single sample WLAs, based on a weekly sampling frequency, are expressed as annual allowable exceedance days and are shown in Table 1 (interim) and Table 2 (final).

Table 1. Interim Single Sample WLAs for Weekly Sampled Sites, Expressed as Annual Allowable Exceedance Days

Location	Summer Dry Weather	Winter Dry Weather	Wet Weather
Hobie Beach	6	4	6
Kiddie Beach	8	4	5

Table 2. Final Single Sample WLAs for Weekly Sampled Sites, Expressed as Annual Allowable Exceedance Days

Location	Summer Dry Weather	Winter Dry Weather	Wet Weather
Hobie Beach	0	1	3
Kiddie Beach	0	1	3

The following rolling 30-day geometric mean water quality objectives for waters designated REC-1 are referenced in the TMDL:

- a. Total coliform density shall not exceed 1,000 MPN/100 mL.

- b. Fecal coliform density shall not exceed 200 MPN /100 mL.
- c. Enterococcus density shall not exceed 35 MPN/100 mL.

The interim 30-day rolling geometric mean WLAs, based on a weekly sampling frequency, are expressed as allowable exceedance days in the TMDL Basin Plan Amendment and are shown in Table 3. The final 30-day rolling geometric mean WLAs are zero allowable exceedance days during any season.

Table 3. Interim 30-day Rolling Geometric Mean WLAs for Weekly Sampled Sites, Expressed as Allowable Exceedance Days

Location	Summer Weather	Winter Weather
Hobie Beach	12	13
Kiddie Beach	8	14

The interim WLAs (listed in Table 1 and Table 3) became effective the date the TMDL went into effect (December 18, 2008) and are applicable until the final WLAs become effective as shown in Table 4.

Table 4. Effective Dates of Final WLAs

Calculation Type and Time Period	Effective Date of Final WLAs
Single Sample WLAs for Dry Weather	December 18, 2013
Single Sample WLAs for Wet Weather	December 18, 2018
Rolling 30-day Geometric Mean WLA	December 18, 2013

1.3 Monitoring Summary

Monitoring at the CIH Beaches is based on TMDL and State monitoring requirements. Monitoring occurs at the beach sampling locations (VCEHD 36000 and VCEHD 37000) on a weekly frequency, year-round. Samples are collected in ankle to knee deep water.

This analysis includes water quality monitoring data from February 4, 2009 through October 31, 2016. The majority of the monitoring data were collected by the Ventura County Environmental Health Department (VCEHD). Some dates with missing data from the VCEHD were filled in with monitoring data collected by the Ventura County Water Protection District (VCWPD).

Sampling has generally occurred on a weekly basis. Typically, if a dry weather sample exceeded a water quality objective a follow-up sample was collected on the following day. As a result, there are numerous weeks with back-to-back sample days. The monitoring periods with unfilled gaps, where samples were not collected by the VCEHD or VCWPD, include the following periods, with explanations for why each period was missed:

- 12/18/2008 – 1/28/2009 (Hobie and Kiddie Beach): State budget cut for ocean water testing, no funding available for this time period.
- 11/22/2010 – 1/17/2011 (Hobie Beach): No sampling due to beach maintenance (gate locked).
- 12/17/2012 – 2/18/2013 (Hobie Beach): Dredging equipment on beach, area fenced (no access).
- 9/9/2014 (Hobie and Kiddie Beach): Dredging equipment on beach, area fenced (no access).
- 9/30/2014 (Hobie Beach): Dredging equipment on beach, area fenced (no access).
- 10/21/2014 (Hobie Beach): Dredging equipment on beach, area fenced (no access).
- 12/29/2014 (Hobie Beach) – No access (gate locked).

Table 5 shows a summary of missed weekly sampling at both beaches for each season (as defined for the single sample WLA) and year. Table 6 shows a summary of missed weekly sampling at both beaches for each season (as defined for the Geometric Mean WLA) and year.

**Table 5. Summary of Missing Data
(Seasons Defined for Single Sample WLA)**

TMDL Year (Nov 1 - Oct 31)	Missed Weekly Samples					
	Summer Dry		Winter Dry		Wet	
	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
2008/2009 ^{1,2}	0	0	9	9	4	4
2009/2010	0	0	0	0	0	0
2010/2011	0	0	4	0	5	0
2011/2012	0	0	0	0	0	0
2012/2013	0	0	7	0	3	0
2013/2014	3	1	0	0	0	0
2014/2015	0	0	1	0	0	0
2015/2016	0	0	0	0	0	0

1. Four of the nine weeks not sampled during the 2009 winter dry season were not sampled because the TMDL was not effective until December 18, 2008.

2. Three of the four weeks not sampled during the 2009 wet season were not sampled because the TMDL was not effective until December 18, 2008.

**Table 6. Summary of Missing Data
(Seasons Defined for Geometric Mean WLA)**

TMDL Year (Nov 1 - Oct 31)	Missed Weekly Samples			
	Summer		Winter	
	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
2008/2009 ¹	0	0	13	13
2009/2010	0	0	0	0
2010/2011	0	0	9	0
2011/2012	0	0	0	0
2012/2013	0	0	10	0
2013/2014	3	1	0	0
2014/2015	0	0	1	0
2015/2016	0	0	0	0

1. Seven of the 13 weeks not sampled during the 2009 winter season were not sampled because the TMDL was not effective until December 18, 2008.

2. ANALYSIS METHODOLOGY

2.1 Single Sample

For each sample result, the measured indicator bacteria concentrations were compared to the single sample water quality objectives. If any one of the objectives were exceeded, one exceedance was counted, with exceedance counts summed by season to compare with weekly sampling allowed exceedance days. Occasional follow-up samples result in multiple samples in a week. If both samples exceed objectives, this is counted as one weekly exceedance. However, if the first day exceeds but the second day does not, this counts as 1/7th (0.143) of a weekly exceedance to enable comparison with allowed exceedance days since these assume strict weekly sampling.

Single sample exceedance day totals were analyzed by season. For each TMDL year (November 1 – October 31), sampling days were classified as a winter dry, summer dry, or wet day. Wet days are classified as days with at least 0.1 inches of rain and the three days following, based on rainfall data from the Port Hueneme – Oxnard Sewer Plant station (VCWPD #017C)² and the CIH – Kiddie Beach station (VCWPD #215A)³. Winter dry

² Note that the TMDL used historical rainfall data from the Los Angeles International Airport (LAX) meteorological station for calculating the WLAs, since this station has the longest historical rainfall record (54 years) in the Los Angeles region.

³ Hourly rainfall data were downloaded from the VCWPD Hydrologic Data Server (http://www.vcwatershed.net/hydrodata/php/getstations.php?dataset=rain_hour) to determine daily rainfall totals. The Port Hueneme – Oxnard Sewer Plant station (VCWPD # 017C) was used for 2008 – 2015. The new CIH – Kiddie Beach station (VCWPD #215A) came online partway through 2015 and therefore was used

weather is defined as days between November 1 and March 31 that are not classified as wet days. Summer dry weather includes days between April 1 and October 31 that are not wet weather days. The number of allowable exceedance days listed in the TMDL Basin Plan Amendment were calculated, by the Regional Board staff, based on the number of wet days during the 90th percentile storm year⁴ (LARWQCB 2007). There were 79 wet days during the 90th percentile storm year at the CIH rain gage station (VCWPD #215) (based on 50 years of record, 1964-2013). None of the TMDL compliance years had more wet days than the 90 percentile storm year; though 2010 and 2011 were close to the 90th percentile year with 75 and 72 wet days, respectively.

2.2 Geometric Mean

The 30-day rolling geometric mean calculations were performed based on approaches set forth by the TMDL Basin Plan Amendment, the TMDL staff report (LARWQCB, 2007), and conversation with LARWQCB staff (Man Voong, personal communication, October 16, 2014). These approaches maintain that geometric means are to be computed based on a minimum of five samples on a rolling 30-day basis during each TMDL season.

For weekly geometric mean calculations, the following procedure is used:

1. A rolling 30-day geometric mean is calculated every day that a sample is collected, as long as the following conditions are true:
 - a. There are at least five samples collected in the rolling 30-day window.
 - b. The 30-day window is contained within the same season (i.e. summer or winter).
2. If there are not at least five samples in the 30-day window or all samples were not collected during the same season, there are insufficient samples to perform the geometric mean calculation.

Recent Southern California MS4 permits and TMDL include slight variations on the calculation approach of geometric means, including the exclusion of wet weather results in the calculation (San Diego MS4 permit, 2013) and the calculation of a 6-week rolling geometric mean (LARWQCB, 2014).

For the total and fecal coliform geometric mean calculation, the non-detect results were replaced with the value of the lower detection limit of that sample. For the enterococcus geometric mean calculation, the non-detect results with a lower detection limit less than 3.7 organisms/100 mL were replaced with the value of the lower detection limit of that sample,

for 2016 and will be used for future analyses. Hourly data from 9/30/2015 – 10/6/2016 are preliminary data and subject to revision. Hourly data from 10/7/2016 – 10/31/2016 are unverified data.

⁴ The “storm year” is defined as November 1 to October 31 to be consistent with the TMDL years.

while the non-detect results with lower detection limit greater than or equal to 3.7 organisms/100 mL were replaced with a value of 3.7 organisms/100 mL. This approach is consistent with the approach used by the Los Angeles Regional Water Quality Control Board in the Los Angeles region's 2012 bacteria TMDL reopeners, based on data analyses performed by the City of Los Angeles⁵.

The number of geometric mean calculations performed on weekly samples and the total number of geometric mean objective exceedances, separated by summer and winter season, were used to determine an exceedance percentage for each TMDL year and season. Sampling days with insufficient data to calculate a geometric mean (as defined above) did not contribute to the exceedance percentage. Similar to the single sample calculations, a follow-up sample (collected after an exceedance day) that was above an objective was not counted as a separate exceedance. A follow-up sample that was below an objective meant the first day was only counted as a fractional exceedance ($1/7^{\text{th}}$ or 0.143), to allow comparison with allowed exceedance days since these assume strict weekly sampling.

3. RESULTS

3.1 Single Sample Results

The 2009-2013 single sample exceedance days for dry weather (both summer and winter) are compared to interim allowable exceedance days. The 2014 TMDL year results are compared to interim allowable exceedance days for data collected before December 18, 2013, while data collected for the remainder of the 2014 TMDL year are compared to final allowable exceedance days. Results from the 2015-2016 TMDL years for dry weather single sample exceedance days (both summer and winter) are compared to final allowable exceedance days. All single sample exceedance days for wet weather are compared to the interim allowable exceedance days since the final wet weather WLAs are not effective until 2018. Table 7 through Table 9 summarize the seasonal monitoring results for each TMDL year including the total number of weekly samples collected at each location, the number of single sample exceedance days based on water quality objectives discussed in section 1.2, and the resulting exceedance percentage. The interim and final allowable exceedance days for each location are shown graphically in Figure 1 through Figure 3.

⁵ This is based on the City of Los Angeles Environmental Monitoring Division finding that, "Assuming a normal distribution of the log results, 90% of results reported as less than 10, would be less than 3.7," as described in the June 2012 Los Angeles Bacteria TMDL Reconsideration Staff Report ("Reconsideration of Certain Technical Matters of the Santa Monica Bay Beaches Bacteria TMDLs; the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL; and the Los Angeles Harbor Inner Cabrillo Beach and Main Ship Channel Bacteria TMDL – Staff Report")

Table 7. Summer Dry Weather Single Sample Monitoring Results

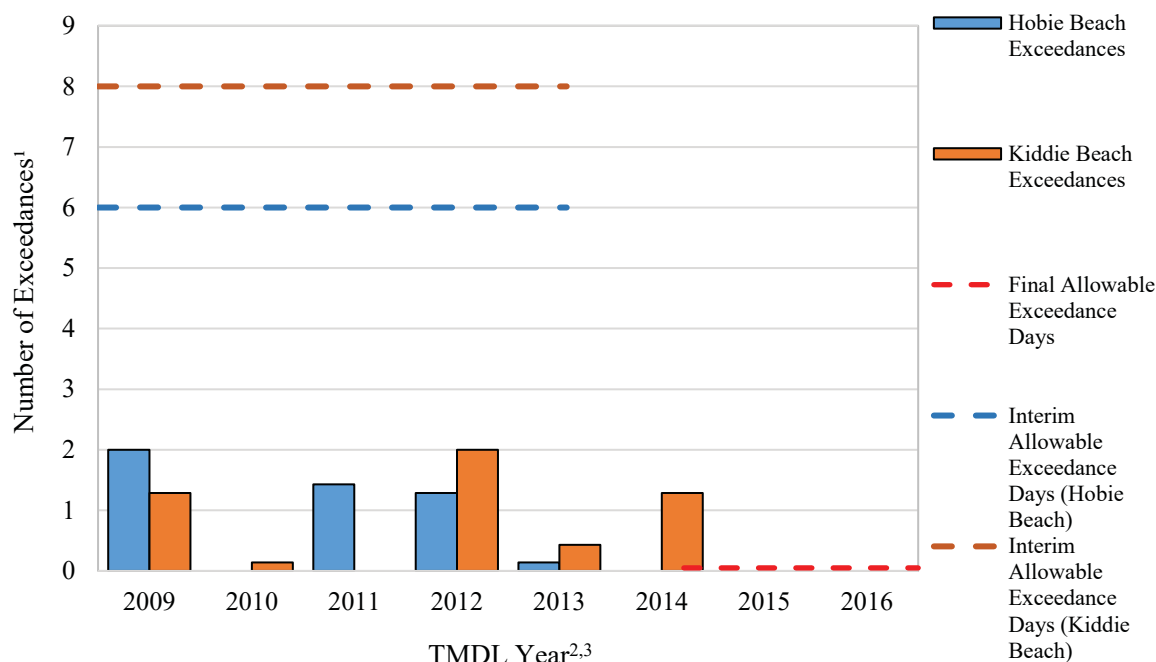
TMDL Year (Apr 1 - Oct 31)	Weeks Sampled		Exceedance Days ^{1,2}		Allowable Exceedance Days		Exceedance Percentage ³	
	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
2009	29	29	2.0	1.3	6	8	6.9%	10%
2010	24	24	0	0.14	6	8	0%	4.2%
2011	28	28	1.4	0	6	8	14%	0%
2012	30	30	1.3	2.0	6	8	13%	13%
2013	30	30	0.14	0.43	6	8	3.3%	10%
2014	28	30	0	1.3	0	0	0%	13%
2015	25	25	0	0	0	0	0%	0%
2016	29	29	0	0	0	0	0%	0%

1. As discussed in section 2.1, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.

2. Exceedance days in **bold** are above the applicable WLA

3. Exceedance percentage represents total number of sampled exceedance days divided by the total number of samples collected during the season.

Figure 1. Summer Dry Weather Single Sample Exceedances



1. As discussed in section 2.1, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.

2. Zero exceedance days in 2010, 2014, 2015, and 2016 at Hobie Beach.

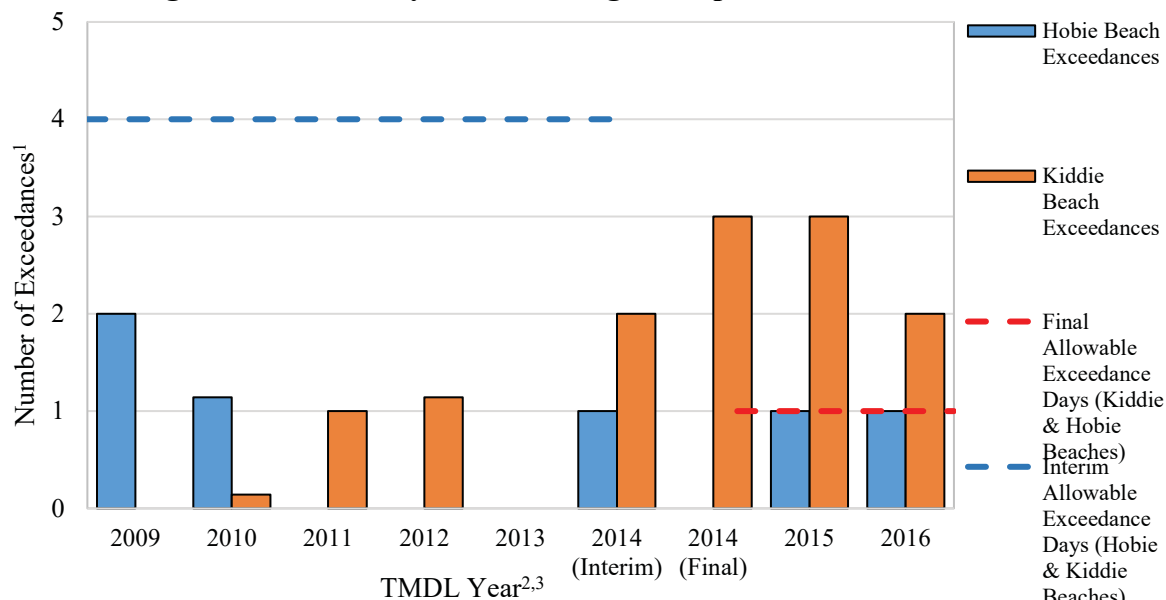
3. Zero exceedance days in 2011, 2015, and 2016 at Kiddie Beach

Table 8. Winter Dry Weather Single Sample Monitoring Results

TMDL Year (Nov 1 - Mar 31)	Weeks Sampled		Exceedance Days ^{1,2}		Allowable Exceedance Days		Exceedance Percentage ³	
	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
2009	6	6	2.0	0	4	4	33%	0%
2010	14	14	1.1	0.14	4	4	21%	7.1%
2011	8	12	0	1.0	4	4	0%	8.3%
2012	15	15	0	1.1	4	4	0%	13%
2013	8	14	0	0	4	4	0%	0%
2014 (Interim) ⁴	5	5	1.0	2.0	4	4	20%	40%
2014 (Final) ⁵	13	13	0	3.0	1	1	0%	23%
2015	14	15	1.0	3.0	1	1	7.1%	20%
2016	17	17	1.0	2.0	1	1	5.9%	12%

1. As discussed in section 2.1, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.
2. Exceedance days in **bold** are above the applicable WLA
3. Exceedance percentage represents total number of sampled exceedance days divided by the total number of samples collected during the season.
4. 2014 (Interim) include dates before December 18, 2013
5. 2014 (Final) includes December 18, 2013 and subsequent days.

Figure 2. Winter Dry Weather Single Sample Exceedances



1. As discussed in section 2.1, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.
2. Zero exceedance days in 2009 and 2013 at Kiddie Beach
3. Zero exceedance days in 2011, 2012, and 2013 at Hobie Beach.
4. 2014 (Interim) include dates before December 18, 2013.
5. 2014 (Final) includes December 18, 2013 and subsequent days.

Table 9. Wet Weather Single Sample Monitoring Results

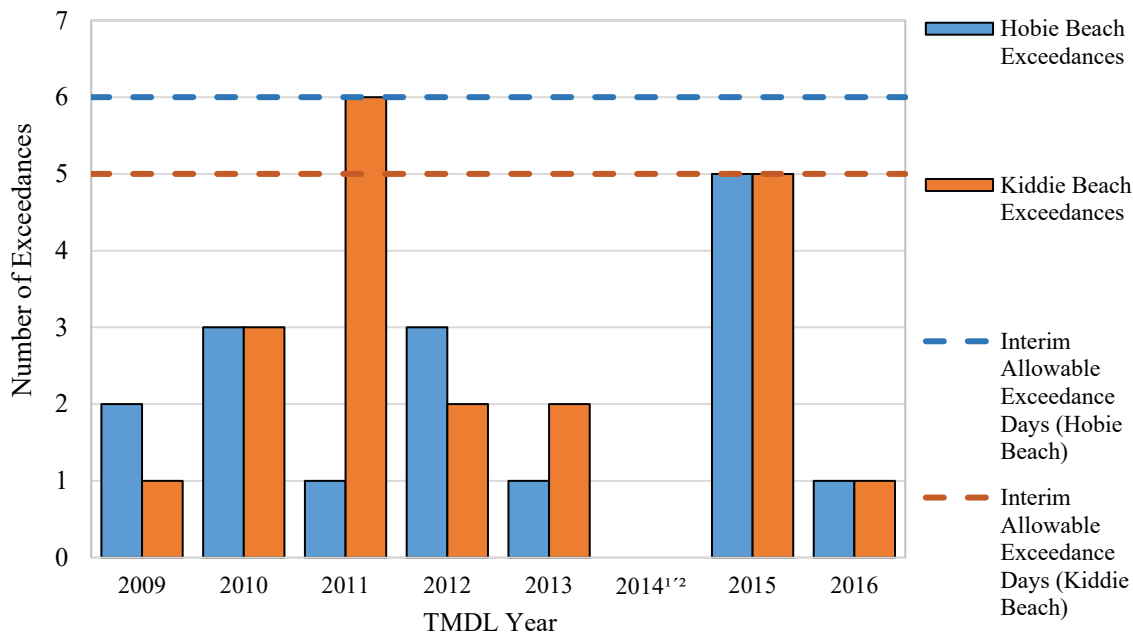
TMDL Year (Nov 1 - Oct 31)	Wet Weather Days	Samples Collected		Exceedance Days ^{1,2}		Allowable Exceedance Days		Exceedance Percentage ³	
		Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
2009	59	4	4	2	1	6	5	50%	25%
2010	75	14	14	3	3	6	5	21%	21%
2011	72	7	12	1	6	6	5	14%	50%
2012	36	8	8	3	2	6	5	38%	25%
2013	52	4	8	1	2	6	5	25%	25%
2014	25	3	3	0	0	6	5	0%	0%
2015	62	13	12	5	5	6	5	42%	45%
2016	41	7	7	1	1	6	5	14%	14%

1. Follow-up samples were not generally collected for wet weather days. Therefore, the exceedance day totals only include sampled days.

2. Exceedance days in **bold** are above the applicable WLA

3. Exceedance percentage represents total number of sampled exceedance days divided by the total number of samples collected by season.

Figure 3. Wet Weather Single Sample Exceedances



1. Zero exceedance days in 2014 at Hobie Beach.

2. Zero exceedance days in 2014 at Kiddie Beach.

3.2 Geometric Mean Results

The 2009-2013 geometric mean exceedance days (i.e., exceedances of any of the rolling 30-day geometric mean objectives) are compared to interim allowable exceedance days. The 2014 TMDL year results for data collected before December 18, 2013 are compared to interim allowable exceedance days, while data collected on or after December 18, 2013 are compared to final allowable exceedance days. Summaries of geometric mean calculation results for the summer and winter weather monitoring data are shown in Table 10 and Table 11.

The number of weekly geometric means calculated for both locations are included along with the number of exceedance days based on geometric mean water quality objectives. Geometric mean exceedance days, including interim and final allowable exceedance days, are illustrated for summer in Figure 4 and winter in Figure 5.

Table 10. Summer Geometric Mean Exceedance Results

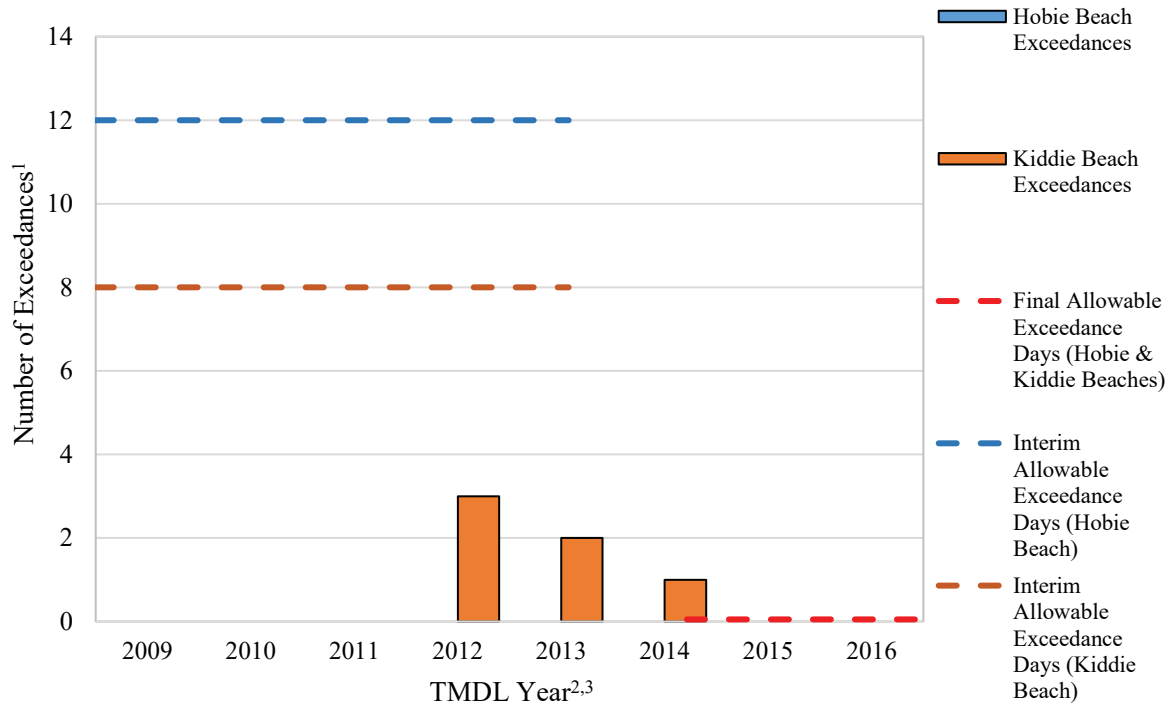
TMDL Year (Apr 1 - Oct 31)	Days with Geometric Mean Calculations		Exceedance Days ^{1,2}		Allowable Exceedance Days		Exceedance Percentage ³	
	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
2009	26	28	0	0	12	8	0%	0%
2010	28	27	0	0	12	8	0%	0%
2011	28	26	0	0	12	8	0%	0%
2012	30	29	0	3	12	8	0%	14%
2013	28	30	0	2	12	8	0%	10%
2014	18	22	0	1	0	0	0%	9.1%
2015	27	26	0	0	0	0	0%	0%
2016	27	27	0	0	0	0	0%	0%

1. As discussed in section 2.1, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.

2. Exceedance days in **bold** are above the applicable WLA

3. Exceedance percentage represents total number of sampled exceedance days divided by the total number of sample days with geometric mean calculations during the season.

Figure 4. Summer Weekly Geometric Mean Exceedances



1. As discussed in section 2.1, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.
2. Zero geometric mean exceedances in 2009, 2010, 2011, 2015, and 2016 at Kiddie Beach.
3. Zero geometric mean exceedances in all years at Hobie Beach.

Table 11. Winter Geometric Mean Exceedance Results

TMDL Year (Nov 1 - Mar 31)	Days with Geometric Mean Calculations		Exceedance Days ^{1,2}		Allowable Exceedance Days		Exceedance Percentage ³	
	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach	Hobie Beach	Kiddie Beach
2009	5	5	5	0	13	14	100%	0%
2010	20	19	5	5.1	13	14	30%	32%
2011	6	17	0	9	13	14	0%	53%
2012	17	17	0	3	13	14	0%	18%
2013	3	15	0	0	13	14	0%	0%
2014 (Interim) ⁴	3	3	0	3	13	14	0%	100%
2014 (Final) ⁵	14	14	0	3	0	0	0%	21%
2015	13	18	0	12	0	0	0%	67%
2016	18	18	0	1	0	0	0%	5.6%

1. As discussed in section 2.1, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.

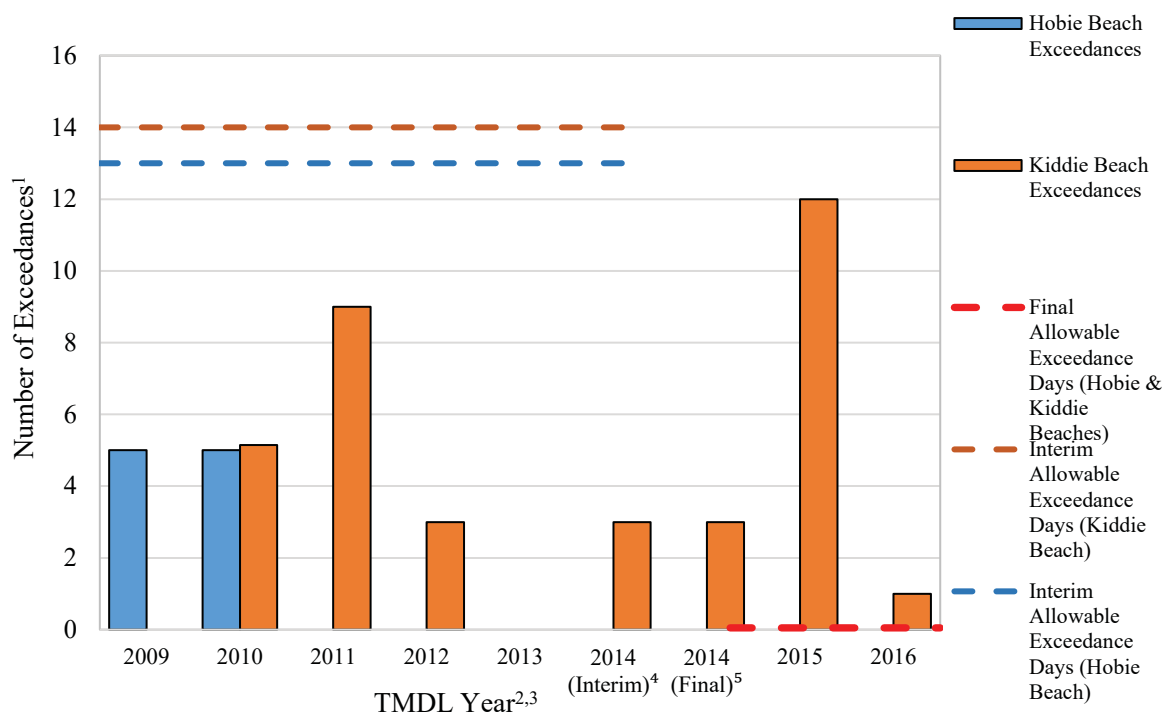
2. Exceedance days in **bold** are above the applicable WLA

3. Exceedance percentage represents total number of sampled exceedance days divided by the total number of sample days with geometric mean calculations during the season.

4. 2014 (Interim) include dates before December 18, 2013.

5. 2014 (Final) includes December 18, 2013 and subsequent days.

Figure 5. Winter Weekly Geometric Mean Exceedances



1. As discussed in section 2.1, if a follow-up sample did not exceed a water quality objective, then only a fractional exceedance was counted for that week.
2. Zero geometric mean exceedances in 2009 and 2013 at Kiddie Beach.
3. Zero geometric mean exceedances in 2011 through 2016 at Hobie Beach.
4. 2014 (Interim) include dates before December 18, 2013.
5. 2014 (Final) includes December 18, 2013 and subsequent days.

4. OBSERVATIONS

Interim summer and winter dry weather single sample WLAs were never exceeded. Final summer dry weather single sample WLAs were only exceeded once, at Kiddie Beach in 2014. Final winter dry weather single sample WLAs were exceeded three times, at Kiddie Beach in 2014, 2015, and 2016. It should be noted that samples were missed at Hobie and Kiddie Beaches in the summer and winter dry seasons during multiple years (see Table 5). Therefore, total exceedances days could have been somewhat higher than reported for each of these periods.

Although final WLAs for wet weather do not become effective until 2018, the majority of wet seasons between 2009 and 2016 met the final allowable exceedance days of three days for both beaches. Only the 2011 wet season surpassed the interim allowable exceedance days for wet weather sampling (at Kiddie Beach). Recent drought conditions have resulted in lower than average wet days per year (see Table 9), potentially contributing to the very low number of wet weather exceedance days observed per year.

Similar to single sample dry weather monitoring results, there were no exceedances of interim geometric mean WLAs at Kiddie or Hobie beaches. Final geometric mean WLAs for the summer season were only exceeded at Kiddie Beach in 2014, while final geometric mean WLAs for the winter season were exceeded at Kiddie Beach in 2014, 2015, and 2016. Total geometric mean exceedance days could have been somewhat higher than reported during periods when samples were missed, although there have been no more than three missed weekly samples in a single season and beach since final geometric mean WLAs became effective (see Table 6).

5. REFERENCES

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United States Environmental Protection Agency. 1986. Ambient water quality criteria for bacteria – 1986. EPA 440/5-84-002, Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C.

Appendix B

Additional Information for Implemented BMPs

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1 SCCWRP MONITORING ACTIVITIES



(Provided by the County)



(Provided by the County)



(Provided by the County)



**Ventura County
Watershed Protection District
Water & Environmental Resources Division**

MEMORANDUM

DATE: February 3, 2015

FROM: Bram Sercu, Water Resources Specialist

TO: Ewelina Mutkowska, Engineering Manager

SUBJECT: Summary of host-specific marker testing results at Kiddie Beach

Introduction

Kiddie Beach is located along the entrance channel to Channel Islands Harbor, and experiences occasional exceedances of numeric targets specified in the Harbor Beaches of Ventura County Bacteria TMDL. A recent source identification study suggested that most likely sources of fecal indicator bacteria include nearby sanitary sewer lines, birds and dogs.¹ However, dredging activities in the harbor entrance channel occurred in October of 2014, and appeared to coincide with elevated bacteria levels at the beach, based on weekly beach water quality monitoring. As weekly beach water quality monitoring at Kiddie Beach includes collection and pre-processing of samples for the Bight 2013 Microbiology study, there was an opportunity to analyze samples for host-specific genetic markers and assess whether dredging in the channel could be associated with elevated bacteria levels. The samples collected as part of this study were taken before, during and after construction work to rehabilitate the sanitary sewer force main adjacent to the beach, and were also evaluated for the presence of human waste markers, which were detected at relatively high frequency in 2012.¹

Summary of Results

Ten samples were analyzed for bacteria indicators and human (HF183), dog (DogBad) and bird (BirdGFD) genetic markers. Genetic markers were analyzed by Weston Laboratories, Inc. One sample was collected during dredging of harbor entrance channel (10/21), other samples were analyzed for comparison, i.e. the week after dredging (10/28), just prior to dredging (9/30 – 10/7) and before the summer (5/6 – 6/3). The latter samples were taken before start of construction for sanitary sewer forced main rehabilitation by the Channel Islands Beach Community Services District, when low amounts of sewage may have been contaminating beach waters.¹ Sampling results, field notes regarding potential bacteria sources, and timing of dredging activities and sewer rehabilitation are summarized in Table 1.

¹Modeling Fecal Indicator Bacteria in Ventura County: Quantitative Microbial Risk Assessment, Ventura County, California. Prepared by Southern California Coastal Water Research Project (SCCWRP), March 2013.

Enterococcus concentrations were highest when dredging activities in the harbor entrance channel were occurring (10/21 and 10/22). Human markers were not detected in any sample, either before, during or after construction work to replace sewer force main. Dog markers were detected (but not quantifiable) on only one occasion, and observation did not correspond to observed dog activity on beach. Dog fecal deposits were never observed. Bird markers were detected in 8 of the 10 samples. However, bird markers were not detected during dredging, even though birds and bird fecal deposit were observed.

Table 1. Summary of sampling results, field observation and dredging and sewer rehabilitation activities relevant to Kiddie Beach. Concentrations of Enterococcus and host-specific markers are shown as MPN/100 ml and copies/100 ml, respectively (ND = not detected; DNQ = detected but not quantifiable; n/a = not analyzed).

Date	ENT	Human	Dog	Bird	Activity	Deposit	Channel dredging ¹	New sewer ²
5/6/14	31	ND	ND	10,551	Human/dog	Bird	No	No
5/13/14	<10	ND	ND	3,508	Human	ND	No	No
5/20/14	31	ND	ND	18,215	ND	ND	No	No
5/27/14	<10	ND	ND	10,413	Human/dog	ND	No	No
6/3/14	<10	ND	ND	3,575	ND	Bird	No	No
9/30/14	<10	ND	ND	ND	ND	ND	No	Constr.
10/7/14	42	ND	DNQ	8,678	ND	ND	No	Constr.
10/14/14	<10	ND	ND	2,220	ND	ND	No	Constr.
10/21/14	659	ND	ND	ND	Bird	Bird	Yes	Constr.
10/22/14	738	n/a	n/a	n/a	n/a	n/a	Yes	Yes
10/28/14	31	ND	ND	3,152	ND	ND	No	Yes

¹Dredging activities at the entrance channel west of Kiddie Beach were conducted between 10/14 (approx. 11:30 AM) and 10/23.

²Rehabilitated force main was placed back in service on 10/22. Construction was likely ongoing between 9/30 and 10/22.

Discussion

Based on monitoring data presented here, birds are a potential cause for the elevated *Enterococcus* concentrations observed on 10/21 and 10/22. Note that birds have been observed roosting on pontoon structures used during dredging (Fig. 1). However, a County storm drain outfall south of Kiddie Beach could have been contributing to elevated *Enterococcus* levels as well, as this outfall was identified as a potential source of similarly high *Enterococcus* concentrations earlier in 2014, before the start of the dredging activities (results not shown here).² Insufficient monitoring data is available to determine whether dredging activities can directly impact *Enterococcus* concentrations, e.g. by stirring up sediment. Prior dredging activities also occurred between October 2012 and January 2013, but it's unknown if high *Enterococcus* concentrations were observed during this period.

²Bacteria Total Maximum Daily Load Draft Compliance Report. Harbor Beaches of Ventura County (Kiddie and Hobie Beach). Prepared by GeoSyntec Consultants, December 18, 2014.

Overall, these results support plans laid out in the 2014 TMDL Compliance Report to update operation of the County storm drain diversion to a year-round schedule, and to determine if dry weather exceedances of numeric targets continue following this and other (i.e. sewer rehabilitation) recent improvements. If exceedances continue, birds should be a focus of future source identification investigations. It is also recommended to collect water quality samples when dredging occurs again in one or two years, in order to better determine potential impacts of dredging activities.

Based on the results presented here, there's no evidence that dogs or sanitary sewers are impacting Kiddie Beach.



Fig. 1. Birds roosting on pontoon structure used for harbor dredging.

Additional Monitoring Data Analyzed After Memo

Date	ENT	Human	Dog	Bird	Activity	Deposit	Channel dredging ¹	New sewer ²
11/3/2014	<31	ND	1,580	266	ND	ND	Yes	Yes
12/8/2014	165	ND	<LOQ ³	4,400	ND	Bird	Yes	Yes
12/15/2014	222	1,540	<LOQ ³	1,620	Human	ND	Yes	Yes
12/22/2014	124	ND	1,440	4,720	ND	ND	Yes	Yes
1/12/2015	324	ND	16,600	573	ND	ND	Yes	Yes
1/20/2015	364	ND	ND	298	ND	ND	Yes	Yes
¹ Dredging activities at the entrance channel west of Kiddie Beach were conducted between 10/14 (approx. 11:30 AM) and 10/23. ² Rehabilitated force main was placed back in service on 10/22. ³ Below level of quantification								

3 PUBLIC INFORMATION AND PARTICIPATION PROGRAM (COUNTY) AND EDUCATIONAL SIGNAGE (CITY)



(Provided by the County)



(Provided by the County)



(Provided by the County)

4 PUBLIC OUTREACH - CITY

Stormwater

What we can do...and why we should

Remember, the storm drain system was constructed to protect public health and safety by preventing flooding of homes, businesses, and streets. The storm drain system is typically built with the street system, so that the new streets will drain during storm events. The storm drain system consists of gutters, catch basins, manholes, underground pipes, roadside ditches, and channels. When it rains, or if the yards are over watered, untreated pollutant sources are flushed to the storm drain system and into the ocean.



All of us are responsible for ensuring that our ocean and the contributing waterways remain free of pollution. Make the right choice, be part of the solution and not the problem.

Remember - you are the solution to stormwater pollution.

(Provided by the City - <http://publicworks.cityofoxnard.org/>)

Landscaping & Gardening

Fertilizers and Pesticides - Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Don't overwater your lawn. Adjust the timing of your sprinklers to avoid overwatering. Consider using drip or bubbler irrigation instead of sprinklers.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts.
- Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains.
- Cover piles of dirt or mulch being used in landscaping projects.

Permeable Pavement - Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain to soak through, decreasing stormwater runoff.

Rain Barrels - You can collect rainwater from rooftops in rain barrels. The water can be used later to water lawn, garden areas, or houseplants.

Grassy Swales - Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

To learn more about water wise landscaping design and plants, visit the City of Oxnard's South Oxnard Branch Library California Friendly Demonstration Garden and the [Water Section's Landscaping website](#).

(Provided by the City - <http://publicworks.cityofoxnard.org/>)

Household Hazardous Waste

Some common sources of contaminants in storm runoff include materials such as used motor oil, antifreeze, and paint products that people pour or spill into a street or storm drain.

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

- Never use the gutter or storm drain system for disposal of household waste.
- Properly use and store all toxic products including cleaners, solvents and paints.
- Select water based or latex paints whenever possible.
- Use kitty litter or other absorbent material to clean up spills from paved surfaces.

The City of Oxnard Environmental Resources offers [Household Hazardous Waste Collection events](#). For more information, or to make an appointment call (805) 987-0717.

(Provided by the City - <http://publicworks.cityofoxnard.org/>)

Auto Care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into the storm drains has the same result as dumping the materials directly into our water system.

- Use a commercial car wash that treats or recycles its wastewater.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Did you know that Oil Recycling Centers are a free service to all City of Oxnard residents? To learn more visit the Environmental Resources Division website for locations of [Certified Used Oil Collection Centers](#).

(Provided by the City - <http://publicworks.cityofoxnard.org/>)

5 PROPER PET WASTE DISPOSAL – COUNTY AND CITY



(Provided by the County)



(Provided by the County)



The Watershed Should Only Shed Water

The storm drain system is a vast network of gutters, pipes and open channels designed for flood control, which directs runoff – untreated – from the watershed straight into the waterways.

Polluted stormwater contaminates streams, rivers and lakes. It can kill or damage plants, fish and wildlife, and can degrade the quality of our water.

The Community for a Clean Watershed program was established to protect Ventura County's watershed by preventing stormwater pollution.

For more information on how to keep our watersheds clean, go to cleanwatershed.org.



Printed on recycled paper

Watershed Protection Tips for Pet Owners



What Is Our Watershed?

Our watershed is the total land area, including your yard, from which stormwater drains into streams, rivers or other bodies of water. In Ventura County our primary watersheds drain into the Ventura and Santa Clara Rivers, Malibu and Calleguas Creeks and the marinas and estuaries that flow into the Pacific Ocean.



(Provided by the City and County)



Facts About Pet Waste

Every time it rains, thousands of pounds of accumulated and untreated pet waste in Ventura County can potentially wash into storm drains and flow directly into our streams, lakes and the ocean.

Pet waste runoff includes bacteria and parasites that threaten the health of both people and wildlife, as well as create an overly rich nutrient environment, causing excess weed and algae growth.

A clean and healthy watershed is invaluable to the well-being and beauty of our community. Simple precautions can protect and preserve our watersheds.

What Can You Do?

There are safe methods for handling and disposing of pet waste. By following these easy practices you can protect both the environment and your health.

- Pick up pet waste daily from your yard. While "organic," pet waste is not a safe fertilizer in your yard or in the watershed.



- When you walk your pet, always carry disposable bags to pick up and dispose of waste properly.



Dispose of Dog Waste Properly

- **Put dog waste in the trash.** Wrap it carefully in a sealed bag to prevent spillage during collection.
- **Dog waste can be flushed down the toilet,** so it can be properly treated at a sewage treatment plant. Be sure not to flush the pet waste bag.

Dispose of Cat Waste Properly

- **Put cat waste, including cat litter, in the trash.** Wrap it carefully in a sealed bag to prevent spillage during collection. Cat waste and litter should only be disposed of in the trash.
- **Do not flush cat waste** or used litter down the toilet.
- **Do not mix cat waste** or used litter into your garden soil.

Cat waste has been associated with various diseases found in marine mammals as a result of pathogens that end up in the storm drain system or are not eliminated during sewage treatment.

(Provided by the City and County)

Here is how you can help!

Pet Care

Why should I pick up after my pet?

- When walking your pet, remember to pick up the waste and dispose of it properly. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain.
- Pet waste is more than smelly and unsightly, it can be a major source of bacteria and excess nutrients in local waters.



What should I do with my pet's waste?

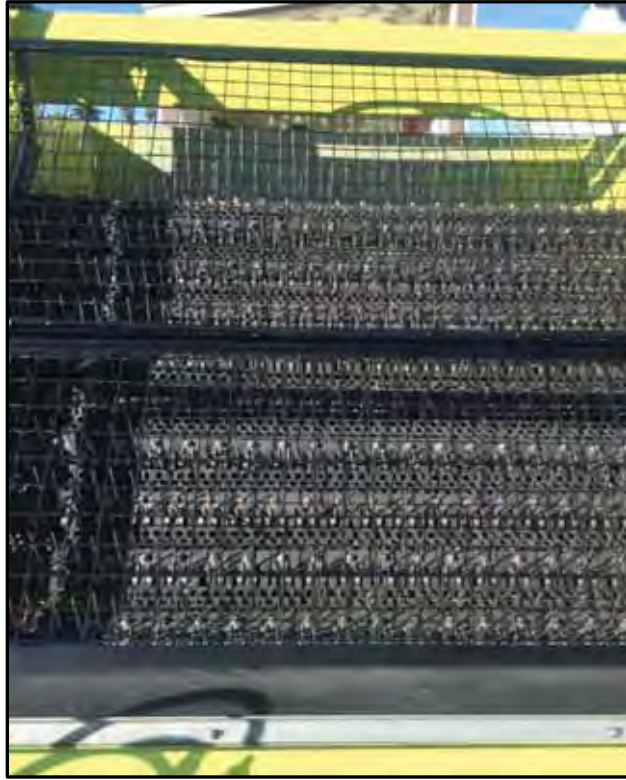
- Toss it: place the waste in a plastic grocery bag, tie the end securely and place in trash.

(Provided by the City - <http://publicworks.cityofoxnard.org/>)

6 BEACH GROOMING – COUNTY



(Provided by the County)



(Provided by the County)



(Provided by the County)



(Provided by the County)

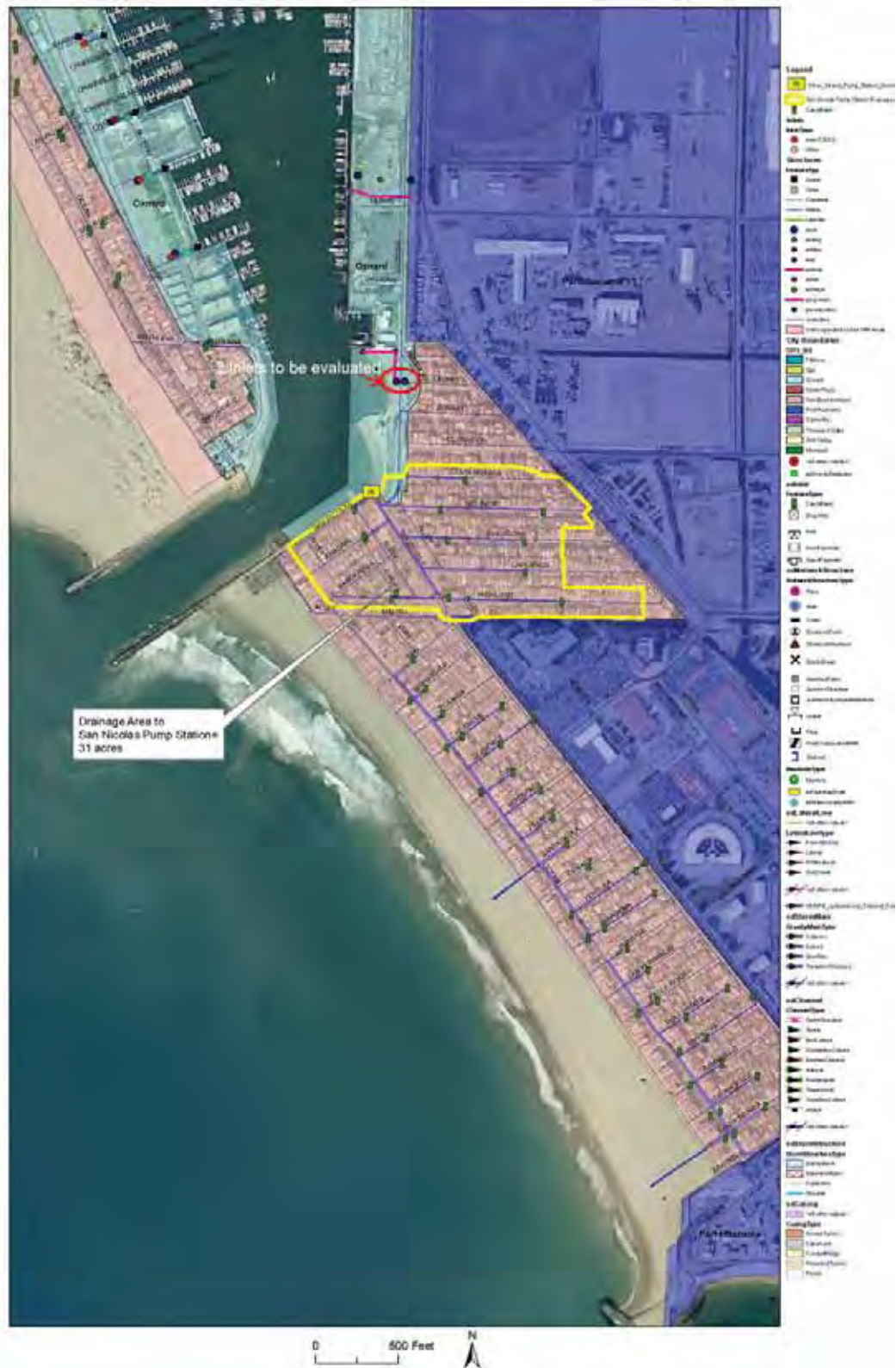


(Provided by the County)



(Provided by the County)

7 CATCH BASIN MONITORING/MAINTENANCE - CITY



(Provided by the City)



West Inlet (Provided by the City)



East Inlet (Provided by the City)

Kiddie Beach-Hobie Beach Bacteria TMDL

Catch Basin Inspection Worksheet

Site ID: H31-CB300	Event Date: 9-20-16
Specific Location: Victoria Ave @ Laurel Ct.	Event Start Time: 11:33 AM
Field Technician Names: Jeremy Grant	Event End Time: 11:35 AM
Current Weather Conditions: Sunny 79°F	# of Pictures Taken: 4
Current Tidal Conditions: High 5.66 Ft	
High Tide at: 12:20 PM 5.91 Ft	Low Tide at: 7:18 PM 0.39 Ft

Types of flow observed (check all that apply)

- | | |
|--|-----------------------------------|
| <input checked="" type="checkbox"/> None | <input type="checkbox"/> Heavy |
| <input type="checkbox"/> Trickle | <input type="checkbox"/> flooding |
| <input type="checkbox"/> Steady | |

Water Clarity

- | |
|---|
| <input checked="" type="checkbox"/> Clear |
| <input type="checkbox"/> Cloudy |
| <input type="checkbox"/> Milky |
| <input type="checkbox"/> Other: _____ |

Floatables observed (check all that apply)

- | | | |
|--|---------------------------------|---------------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> Sheen | <input type="checkbox"/> Oily Sheen |
| <input checked="" type="checkbox"/> Garbage Ribbon | <input type="checkbox"/> Sewage | <input type="checkbox"/> Other: _____ |

Was there evidence of any runoff in the curb or gutters? If yes, please describe:

No runoff was observed

Was any water present in the catch basin? If yes, possible sources? Yes, High tide.

Water level is almost at top of catch basin.

Actions for Follow-up:

Additional Notes:

Very high tide today, water level at Hobie Beach is near top of the Jetty. No residential runoff observed in drainage area.

Lead Field Technician Certification (sign/print):



Revised June 2013

Example catch basin inspection worksheet (Provided by the City)



Ocean Water Quality Monitoring Program



County of Ventura
Environmental Health Division
800 South Victoria Avenue
Ventura, California 93009-1730

OWQMP Pamphlet (Provided by the City)

12.16.2016



**If you see this sign posted
at any Ventura County beach:**

- ✦ *Stay out of the ocean for at least 50 yards on either side of the sign.*
- ✦ *There are levels of bacteria in the ocean water that may make you sick!*

CP Feb. 2011

OWQMP Pamphlet (Provided by the City)

8 TRASH MANAGEMENT (CITY) AND BIRD CONTROL MEASURES (COUNTY)



(Provided by the County)



(Provided by the County)

9 DOWNSPOUT DISCONNECT PROGRAM – COUNTY

The City of Portland has been implementing an effective downspout retrofit program since 1996. They report that over 56,000 property owners have disconnected their downspouts, resulting in a significant reduction in potential pollutant loading to storm drains. This program requires that overflows from rain barrels be directed onto a yard or landscape area and must meet certain safety requirements. Roof runoff must also be discharged at least five feet away from any property lines and the discharge pipe should not flow towards the building or neighboring property. Soakage trenches should be at least ten feet away from buildings and five feet away from property and utility lines.

In development of the downspout disconnect program, the County of Ventura reports that the majority of homes in the tier 1 area, Silver Strand and Hollywood Beach, do not have gutters or downspouts. The following pictures include examples of homes in the area, showing that many have no gutters or downspouts. It was reported that approximately ten percent of homes on Rossmore Drive have downspouts or gutters, and a maximum of 40 percent of homes on Ocean Drive have gutters or downspouts.

These homes also have small setbacks and minimal or no landscape areas to discharge rainbarrel or rain water flows. The following pictures show the three foot side yard setback, five foot rear setback, and 20 foot paved front yard at a home in Silver Strand, CA. They also illustrate the density of homes in Silver Strand and the lack of green landscaping areas, and contrast the setbacks and landscaping of typical homes in Portland, OR. The home has five to ten foot side yard setbacks, 20 to 40 foot rear yard setbacks, and 20 feet of a landscaped front yard. The lower home density and increase in green landscaping area is illustrated. All photographs were provided by the County.



Rossmore Drive 272-256 (About 10% of homes in this area have gutters or downspouts)



Rossmore Drive 284-272



Rossmore Dr. 285-295



Rossmore Dr 324-318



Rossmore Dr. 341-361



Rossmore Dr. 368-374



Ocean Drive 3430-3424 (Maximum of 40% with gutters or downspouts on Ocean Drive)

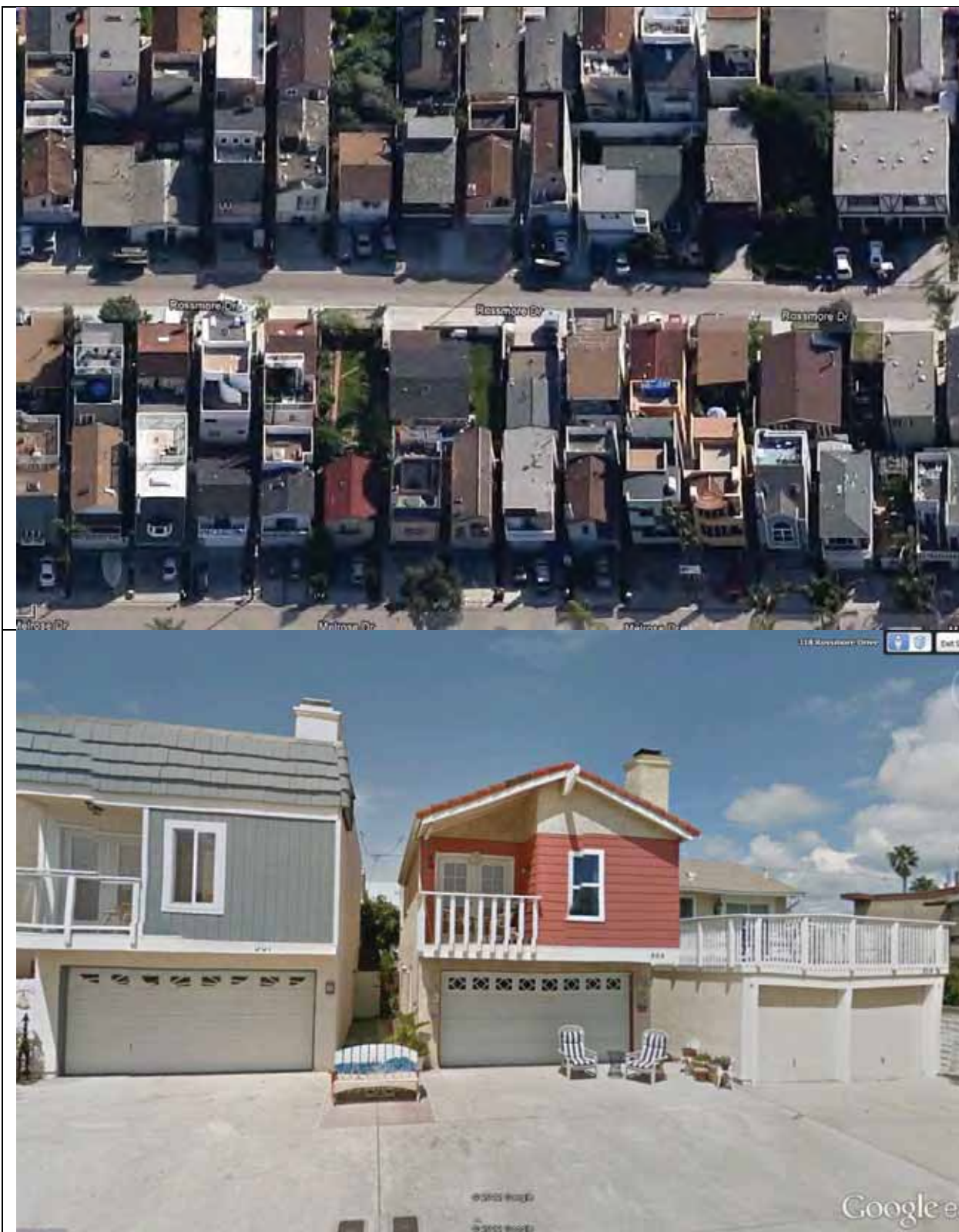


Ocean Drive 3424 – Internal routing of gutters

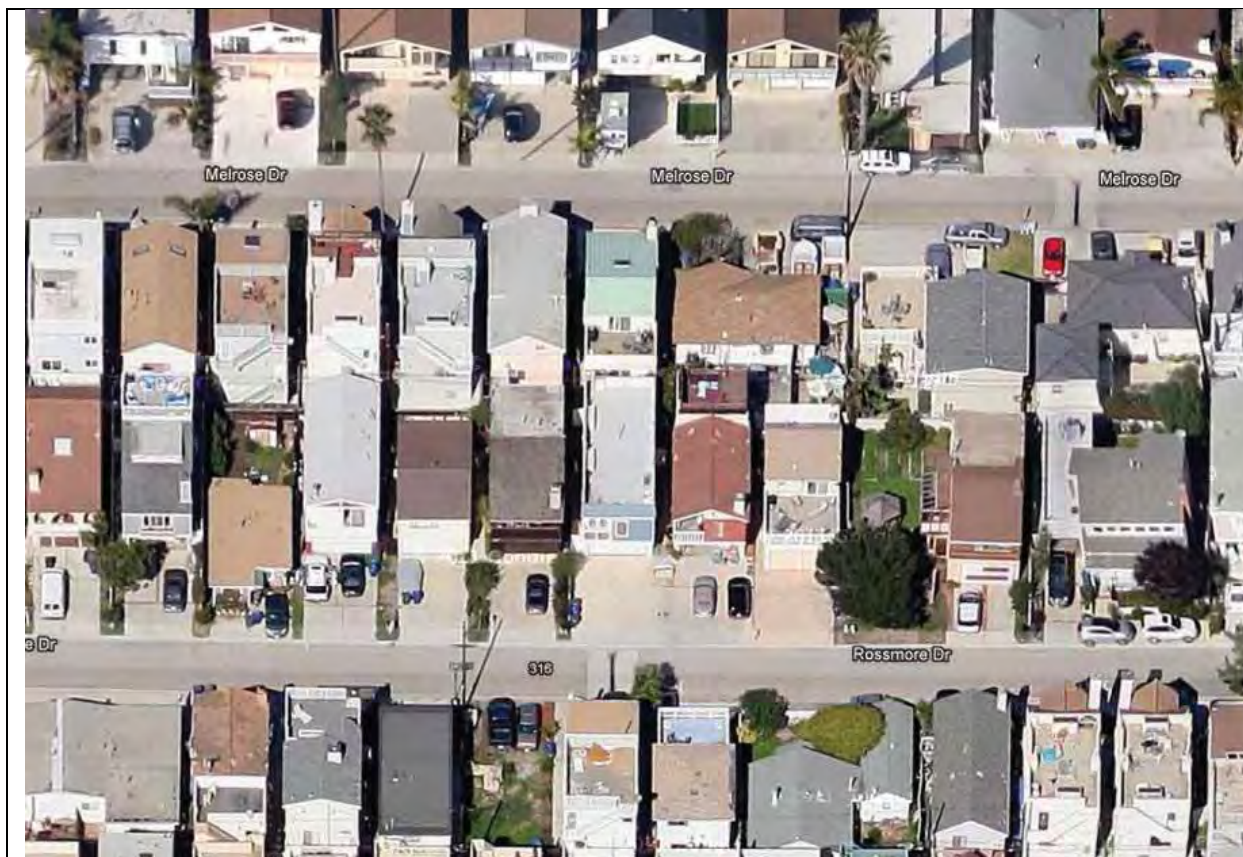
Portland, OR vs. Silver Strand, CA



SILVER STRAND, CA - Rossmore Drive, 264-256: 3 ft side yard setbacks, 5 ft rear setbacks, 20 ft paved front yard setbacks. Few or no gutters/ downspouts, little or no landscaping to direct water to.



SILVER STRAND, CA - Rossmore Drive, 301-309: 3 ft side yard setbacks, 5 ft rear setbacks, 20 ft paved front yard setbacks. Few or no gutters or downspouts, little or no landscaping to direct water to.



Portland, OR

Typical Residential Development



PORTLAND OR - 2704, SE Kelly: 5-10 side yards, 20-40 rear yard setbacks, 20 ft landscaped front yards



Build Ocean Friendly Gardens

Bricks To Sponges

Is your soil a BRICK or a SPONGE? Sponges are Living Soil filled with microorganisms working together to feed plants, garden water when it's too wet. Much, add compost and good soil to turn it into a sponge.

Swales Are Swell

A planted swale is a contour on the land that collects, absorbs and filters water running through a site, removing pollutants by infiltration into the soil. Rain yards increase runoff while the mounds on either side of the swale (called Berms) keep water on site, giving it time to sink in.

Slow, Spread, Sink

Instead of Paving, Hiding, and Polluting rainwater, slow it down. Spread it out, and sink as much as you can to reduce your water needs in the landscape, and keep pollution off the beach. An added bonus of Retention is that groundwater may be recharged.

Berms Are Beautiful




Sheet Mulching covers grass with wet paper, compost, and fresh tree trimmings (mulch) to effectively remove the grass by composting it in place. The downspout in the front yard connected underground to the street and pulled the nearby water-way. The homeowner decided to redirect it into the garden.

After a few months of sheet mulching the grass is gone and healthy soil remains. Big, beautiful berms create high and low spots.


Green Your Concrete Footprint


Keep polluted water from running off hard surfaces and contaminating streams, rivers, and the ocean.

Break up concrete, eliminate dry-weather runoff, and make your garden a sponge to become part of the solution.

www.greengardengroup.com





(Provided by the County)

Let's Break It Down



Every time it rains, pollutants you can see (tons of plastic bags, soda cups with straws, and cigarette butts) are mixed with those you can't see (pesticides, fertilizers, dog waste) and sent to the nearest waterway.

Even on dry days, millions of gallons of drinking water are flushed into the waterways after they have run through the dirty streets and storm drains.

End of pipe solutions are not enough. What you do on your property can solve the problem. Be a part of the solution, not the pollution.



Breaking Up Is Easy To Do



Permeable Paving

Replace concrete and asphalt with paving materials that have gaps between them allowing water to flow through rather than run off. These pavements are beautiful too.



Beachin' Driveway

Remove a strip down the middle of the driveway and fill with gravel or add a rainwater storage cell (see insert). Water has a place to get sponged up and your vehicle hedges in on the remaining concrete.



Carve A Path

Break up a continuous concrete pathway or driveway and nest the stones (called 'beachin') in a sand or gravel bed. These permeable paths can be beautiful and artistic while simultaneously increasing permeability.



Roll Out A Barrel

Replace your downspout with a rainchain to slow and direct roof water into a 50 gallon rain barrel. Got more space? Add another barrel. Then use the water for veggies, pets, or fill a birdbath.



Liberate A Curb

Cutting your curb and allowing water to enter a walkway, median or other landscape area adjacent to the street, uses soil to filter and absorb runoff before entering the ocean. Check with your County Transportation Department for restrictions and guidelines.

Break Old Habits



Pick Up After Pup

Thousands of pounds of pet waste, including bacteria and parasites that threaten the health of people and wildlife, wash into our waterways every time it rains. When you walk your pet, carry disposable bags to pick up and deposit waste in a trashcan.



Broom To Groom

Driveways don't grow when you water them, and you just waste drinking water. Use a broom to clean hard outdoor surfaces. Sweep up any debris blown into the street and place in the appropriate trash bin.



Cars To A Car Wash

Take your car to a certified car wash, where you know they are capturing all the used water for proper treatment. Car washing in your driveway puts oil and soap into the storm drain, contributing to water pollution.



Hold On To Your Butt

Cigarette butts take decades to break down, all the while polluting air, soils and degrading our beaches and water quality. Hold on to your butt, and dispose of it properly!



Redirect A Downspout

Get downspouts? Redirect them into landscape areas or planter boxes. Keep water from going to the street via your driveway by adding gutters and a downspout directed to landscape. Add a rain chain that slows water down into a barrel or planter area.

(Provided by the County)

Ocean Friendly Gardens™ Class

Reduce Urban Runoff Pollution + Conserve Water



When: Saturday, June 15, 2013 • 10:00 a.m. to 1:00 p.m.

**Where: School Cafeteria
Hollywood Beach Elementary
4000 Sunset Lane, Oxnard CA 93035**

Sign Up Today! It's

FREE

Space is Limited!

Call Now!

805.477.7139

Registration Deadline

June 12, 2013

Attend this interactive, action packed class taught by a Green Gardens Group landscape designer and learn to:

Develop an Ocean Friendly Garden™

- Install permeable surfaces and on-site water retaining systems
- Use native plants
- Understand water efficient irrigation devices

Use Surfrider Foundation's Principles of CPR® (Conservation • Permeability • Retention) to transform your thirsty landscape into an ocean friendly asset that prevents beach and ocean pollution, saves time and money, and creates wildlife habitat.

- A light snack and drinks will be provided -



For more information, please contact Jason Burke at the County of Ventura Public Works Agency: (805) 477-7139 or by email at jason.burke@ventura.org



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(Provided by the County)



(Provided by the County)



(Provided by the County)



The Watershed Should Only Shed Water

The storm drain system is a vast network of gutters, pipes and open channels designed for flood control, which directs runoff – untreated – from the watershed straight into the waterways. Polluted stormwater contaminates streams, rivers and lakes. It can kill or damage plants, fish and wildlife, and can degrade the quality of our water.

The Community for a Clean Watershed program was established to protect Ventura County's watershed by preventing stormwater pollution.

Watershed Protection Tips for Pet Owners





For more information on how to keep our watersheds clean, go to cleanwatershed.org.





What Is Our Watershed?

Our watershed is the total land area, including your yard, from which stormwater drains into streams, rivers or other bodies of water. In Ventura County our primary watersheds drain into the Ventura and Santa Clara Rivers, Malibu and Calleguas Creeks and the marinas and estuaries that flow into the Pacific Ocean.

(Provided by the County)

Facts About Pet Waste



Every time it rains, thousands of pounds of accumulated and untreated pet waste in Ventura County can potentially wash into storm drains and flow directly into our streams, lakes and the ocean.

Pet waste runoff includes bacteria and parasites that threaten the health of both people and wildlife, as well as create an overly rich nutrient environment, causing excess weed and algae growth.

A clean and healthy watershed is invaluable to the well-being and beauty of our community. Simple precautions can protect and preserve our watersheds.

What Can You Do?

There are safe methods for handling and disposing of pet waste. By following these easy practices you can protect both the environment and your health.

- Pick up pet waste daily from your yard. While "organic," pet waste is not a safe fertilizer in your yard or in the watershed.
- When you walk your pet, always carry disposable bags to pick up and dispose of waste properly.

Dispose of Dog Waste Properly

- Put dog waste in the trash. Wrap it carefully in a sealed bag to prevent spillage during collection.
- Dog waste can be flushed down the toilet, so it can be properly treated at a sewage treatment plant. Be sure not to flush the pet waste bag.



Dispose of Cat Waste Properly

- Put cat waste, including cat litter, in the trash. Wrap it carefully in a sealed bag to prevent spillage during collection. Cat waste and litter should only be disposed of in the trash.
- Do not flush cat waste or used litter down the toilet.
- Do not mix cat waste or used litter into your garden soil.

Cat waste has been associated with various diseases found in marine mammals as a result of pathogens that end up in the storm drain system or are not eliminated during sewage treatment.



cleanwatershed.org



(Provided by the County)

Pet Waste Is Pollution

Bag it

Pet waste stations are located around the Harbor, but just in case, bring plastic bags with you when you walk your dog. Use a bag to pick up the dog waste. Tie the bag closed and throw it in the trash.

Options at Home

Flush dog and cat waste down the toilet. Kitty litter should not be flushed because it can clog your toilet. Double bag kitty litter, tie the bag shut and throw it in the trash.



**Thanks for Keeping Our Harbor and
Beaches Clean!**



County of Ventura Harbor Department
3900 Pelican Way
Oxnard, CA 93035
805.382.3001
www.channelislandsharbor.org

*Please!
Pick Up
After
Your Pet!*



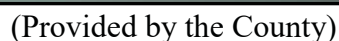
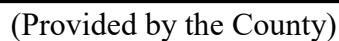
Dog waste left on the street or lawns is not fertilizer. The bacteria in dog waste is often washed down storm drains and ends up directly in the Harbor where it can contaminate large areas of beaches and waterways.

Kitty litter dumped outside can be washed into the Harbor. The bacteria in pet waste can make it unsafe to swim on the beaches or fish in the nearby waters.

Did you know?

One day's waste from one large dog can contain 7.8 billion fecal coliform bacteria, enough to contaminate up to 15 acres of water area. Fecal coliform can make humans sick. Small children are even more likely to become ill from fecal bacterial.

(Provided by the County)



11 STORM DRAIN OUTFALL (TIDEFLEX VALVE) - COUNTY AND CITY



City of Oxnard
Storm Drainage Condition Assessment

SDFA 29 - Kiddie Beach

Outfall MH-H31-100_MIS-H31-800



Location view



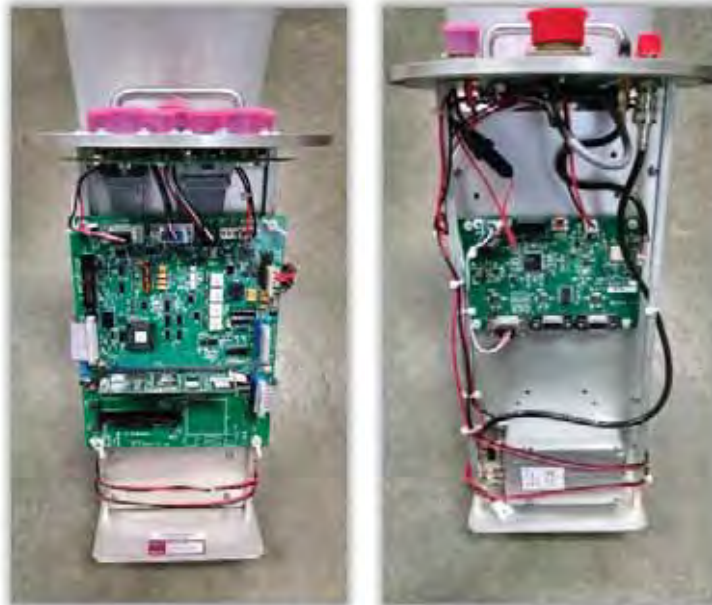
Location view



(Provided by the City)

12 DRY WEATHER DIVERSION (SAN NICHOLAS PUMP STATION) – VCWPD

Month/Year	Gallons Diverted
June 2015	312,582
July 2015	403,052
August 2015	652,414
September 2015	962,778
October 2015	717,237
November 2015	417,165
December 2015	422,456
January 2016	735,602
February 2016	641,254
March 2016	780,597
April 2016	433,128
May 2016	332,596
June 2016	287,577
July 2016	323,352
August 2016	283,962
September 2016	289,669
October 2016	388,231
Total:	8,383,652



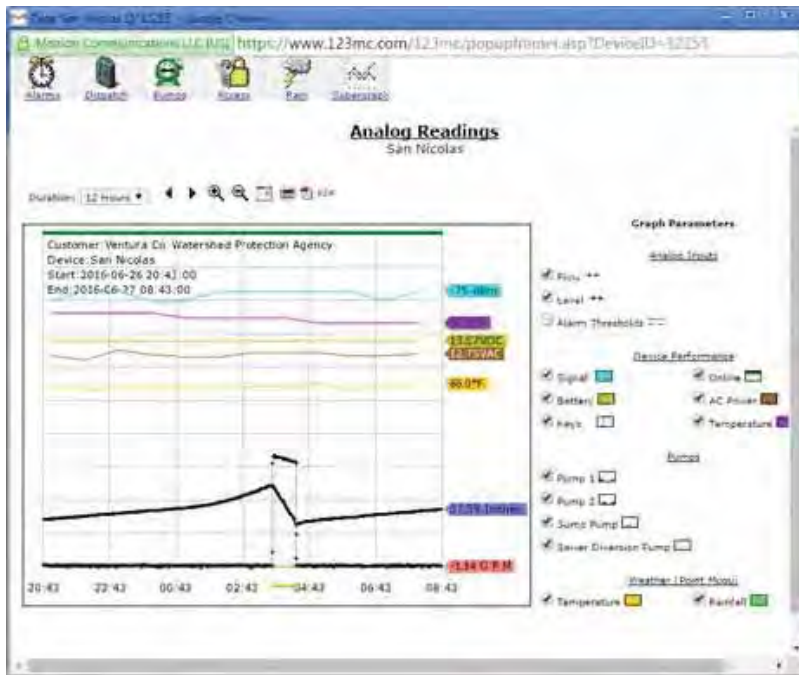
HydroLynx 50386 ALERT2 Transmitter (Provided by the County)



Stand pipe rain gage on roof of pump house (Provided by the County)



Pump Controls (Provided by the County)



(Provided by the County)

13 SAN NICHOLAS PUMP STATION DYE TEST - VCWPD



(Provided by the County)



(Provided by the County)



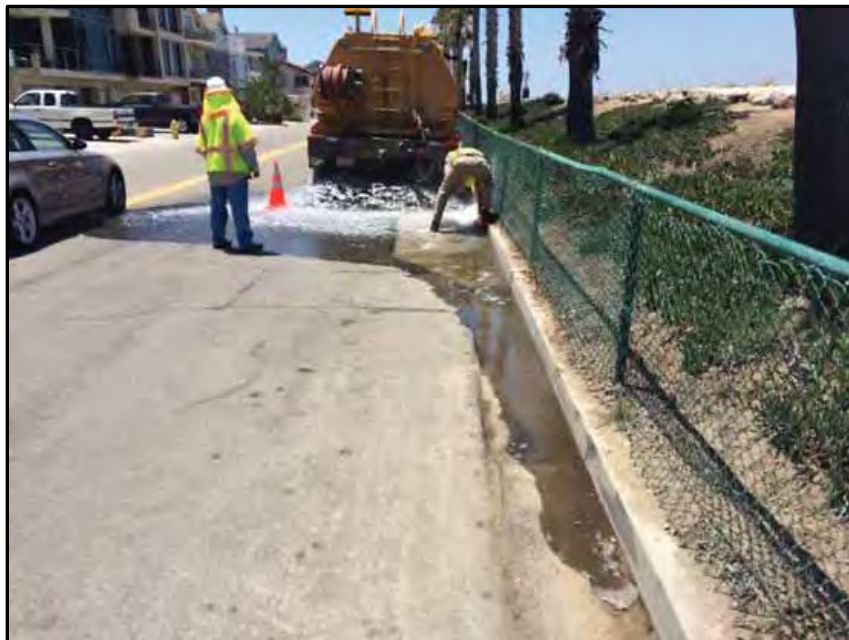
Notification Signs (Provided by the County)



Cole Parmer Yellow/Green Dye (Provided by the County)



Location #1 Manhole (Provided by the County)



Location #2 catch basin (Provided by the County)



Dye Entering Pump Station Containment Vault (Provided by the County)



36" and 18" RCPs discharging to Pump Station Containment Vault (Provided by the County)



Sewer diversion pump discharging to sanitary sewer system (Provided by the County)



Kiddie Beach Area at 2:10 p.m. on 6/16/16 (Provided by the County)



Kiddie Beach Area at 2:45 p.m. on 6/16/16 (Provided by the County)



Follow-up inspection at 9:00 a.m. on 6/17/16 (Provided by the County)



Follow-up inspection at 9:00 a.m. on 6/17/16 (Provided by the County)

14 DREDGING ACTIVITIES



(Provided by the County)



(Provided by the County)



(Provided by the County)

Appendix C

Environmental Health Department – Water Quality Testing Raw Data (Since November 2014)

RUN ON: 11/03/14

WATER QUALITY RESULTS
FROM COLL DATE: 11/03/14
THRU COLL DATE: 11/03/14
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
11/03/14	0905	OCEAN	EN,VH 1,000	63	10	<10
11/03/14	0925	OCEAN	EN,VH 4,000	41	<10	10
11/03/14	0943	OCEAN	EN,VH 7,000	120	10	10
11/03/14	0950	OCEAN	EN,VH 10,000	171	<10	<10
11/03/14	1000	OCEAN	EN,VH 11,000	135	20	<10
11/03/14	1012	OCEAN	EN,VH 13,000	288	74	53
11/03/14	1017	OCEAN	EN,VH 14,000	173	10	10
11/03/14	1038	OCEAN	EN,VH 19,000	15,531	201	124
11/03/14	1151	OCEAN	EN,VH 25,000	1,076	10	<10
11/03/14	1110	OCEAN	EN,VH 36,000	11,199	1,250	<10
11/03/14	1120	OCEAN	EN,VH 37,000	11,199	1,354	31
11/03/14	1148	OCEAN	EN,VH 42,000	857	52	31
11/03/14	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by M. Talent						
11/4/14 Posted						
	19000	Posted at beach entrance @ San Jan Rd. and posted at sampling location on beach				
	36000	Posted perimeter chain-link fence across from sampling location and fence at gate near parking lot				
	37000	Posted at base of steps across from per sample location and at beach entrance next to bathroom.				

hotline 11/4/14

website 11/4/14

email HD + PWA

dbase

RUN ON: 11/12/14

**WATER QUALITY RESULTS
FROM COLL DATE: 11/12/14
THRU COLL DATE: 11/12/14
LOCATION: ENVH, ENVH**

[illegible]

Signs removed 11/13/14

- Hotline - updated 11/13/14

- Website - updated 11/13/14

- HD + PWA email 11/14/14

- dbase entered + uploaded 11/14/14

RUN ON: 11/17/14

**WATER QUALITY RESULTS
FROM COLL DATE: 11/17/14
THRU COLL DATE: 11/17/14
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 11/24/14

**WATER QUALITY RESULTS
FROM COLL DATE: 11/24/14
THRU COLL DATE: 11/24/14
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
11/24/14	0915	OCEAN	EN,VH 1,000	<10	<10	10
11/24/14	0946	OCEAN	EN,VH 4,000	10	10	<10
11/24/14	1005	OCEAN	EN,VH 7,000	<10	<10	<10
11/24/14	1015	OCEAN	EN,VH 10,000	439	<10	<10
11/24/14	1025	OCEAN	EN,VH 11,000	74	63	53
11/24/14	1040	OCEAN	EN,VH 13,000	41	<10	<10
11/24/14	1100	OCEAN	EN,VH 14,000	97	52	10
11/24/14	1105	OCEAN	EN,VH 19,000	20	<10	<10
11/24/14	1135	OCEAN	EN,VH 25,000	74	10	31
11/24/14	1155	OCEAN	EN,VH 36,000	10	<10	53
11/24/14	1204	OCEAN	EN,VH 37,000	364	31	64
11/24/14	1235	OCEAN	EN,VH 42,000	52	10	<10
11/24/14	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by	Wahl					
hotline	11/25/14					
website	11/25/14					
HD + PWA	11/25/14					
dbase	11/25/14					

RUN ON: 12/01/14

12/2/14
Beach posted (37000) - one sign at beach entrance near restroom, and one @ base of stairs.

dbase 12/9/14

12/1/14 rainfall advisory / Press Release / hotline / website 12/1/14

RUN ON: 12/08/14

**WATER QUALITY RESULTS
FROM COLL DATE: 12/08/14
THRU COLL DATE: 12/08/14
LOCATION: ENVH, ENVH**

[illegible]

Sampled by Lapes / Dahl

- hotline - no change (done 12/8 MT)
- website - advisory no change (done 12/8 MT)
- website log of posting (done 12/9 DBW)
- website data (done 12/9 DBW)

email 12/10/14 Vhu

dbase 12/10/14 → lab data ^{DBL} _{prol} (advisory pending)

Postings @ Kiddie
Beach placed on 12/2/14
to remain in-place
due to this failure

RUN ON: 12/15/14

WATER QUALITY RESULTS
FROM COLL DATE: 12/15/14
THRU COLL DATE: 12/15/14
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
12/15/14	0900	OCEAN	EN,VH 1,000	41	<10	<10
12/15/14	0921	OCEAN	EN,VH 4,000	109	<10	<10
12/15/14	0940	OCEAN	EN,VH 7,000	414	<10	31
12/15/14	0948	OCEAN	EN,VH 10,000	2,909	<10	<10
12/15/14	1002	OCEAN	EN,VH 11,000	465	<10	53
12/15/14	1018	OCEAN	EN,VH 13,000	512	10	10
12/15/14	1030	OCEAN	EN,VH 14,000	933	10	10
12/15/14	1100	OCEAN	EN,VH 19,000	754	<10	10
12/15/14	1110	OCEAN	EN,VH 25,000	1,187	63	53
12/15/14	1130	OCEAN	EN,VH 36,000	>24,196	41	53
12/15/14	1135	OCEAN	EN,VH 37,000	>24,196	41	10
12/15/14	1205	OCEAN	EN,VH 42,000	>24,196	285	222
12/15/14	1300	OCEAN	LAB BLANK	<10	<10	<10
12/16/14	Posted Hobie Beach at gate to Hansen enclosed work area and on fence at sidewalk just across from sample location 3000.					
	Replaced one missing post at base of steps @ Kiddie Beach. Posting at beach entrance next to bathroom remains in-place					
	Posted Diamond Beach at site location 42000 (near high-tide mark) and on east side of flowing drain (near high-tide mark)					
12/16/14	Issued Press Release for Hobie, Kiddie, + J Street					

hotline 12/16/14 (rainfall + postings)

website 12/16/14

database (data) 12/16/14

email HD + PWA 12/16/14

database (upload advisories) - pending uploads of open advisories after closed out

RUN ON: 12/29/14

WATER QUALITY RESULTS
FROM COLL DATE: 12/29/14
THRU COLL DATE: 12/29/14
LOCATION: ENVH, ENVH

[illegible]

**WATER QUALITY RESULTS
FROM COLL DATE: 01/05/15
THRU COLL DATE: 01/05/15
LOCATION: ENVH, ENVH**

Sampled by	Wahl
------------	------

abase 1/7/15

RUN ON: 01/12/15

WATER QUALITY RESULTS
FROM COLL DATE: 01/12/15
THRU COLL DATE: 01/12/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
01/12/15	0915	OCEAN	EN,VH 1,000	457	20	<10
01/12/15	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
01/12/15	1000	OCEAN	EN,VH 7,000	1,211	<10	<10
01/12/15	1012	OCEAN	EN,VH 10,000	173	10	<10
01/12/15	1022	OCEAN	EN,VH 11,000	63	<10	10
01/12/15	1036	OCEAN	EN,VH 13,000	2,613	31	10
01/12/15	1050	OCEAN	EN,VH 14,000	2,143	10	10
01/12/15	1106	OCEAN	EN,VH 19,000	1,354	20	<10
01/12/15	1123	OCEAN	EN,VH 25,000	1,119	41	<10
01/12/15	1145	OCEAN	EN,VH 36,000	>24,196	134	20
01/12/15	1150	OCEAN	EN,VH 37,000	>24,196	2,613	324
01/12/15	1220	OCEAN	EN,VH 42,000	>24,196	85	53
01/12/15	1330	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wahl						
1/12/15	Press Release/website/hotline (rain - all beaches)					
1/13/15	Press Release/website/hotline (36000, 37000, 42000)					
1/13/15	: 36000 posted perimeter fence at sidewalk across from sample location and at entrance gate to storage yard.					
	37000 posted at base of steps and at beach entrance South of restrooms					
	42000 posted at high tide marking at sample location					

email HD + PWA

database (data)

database (advisories)

RUN ON: 01/26/15

WATER QUALITY RESULTS
FROM COLL DATE: 01/26/15
THRU COLL DATE: 01/26/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
01/26/15	0915	OCEAN	EN,VH 1,000	52	<10	10
01/26/15	0950	OCEAN	EN,VH 4,000	10	<10	<10
01/26/15	1000	OCEAN	EN,VH 7,000	<10	<10	<10
01/26/15	1015	OCEAN	EN,VH 10,000	<10	<10	<10
01/26/15	1024	OCEAN	EN,VH 11,000	<10	<10	<10
01/26/15	1040	OCEAN	EN,VH 13,000	30	<10	<10
01/26/15	1050	OCEAN	EN,VH 14,000	10	<10	<10
01/26/15	1110	OCEAN	EN,VH 19,000	41	10	10
01/26/15	1128	OCEAN	EN,VH 25,000	156	10	<10
01/26/15	1145	OCEAN	EN,VH 36,000	4,611	41	75
01/26/15	1200	OCEAN	EN,VH 37,000	457	134	75
01/26/15	1230	OCEAN	EN,VH 42,000	97	<10	<10
01/26/15	1320	OCEAN	LAB BLANK	<10	<10	<10
Sampled by WJH						
1/27/15 Removed postings @ 1000, 36000, 37000, 19000						
Hotline 1/27/15						
Website 1/27/15						
database 1/28/15						
1/27/15 removed press release						
email HD + PWA 1/28/15						
uploaded advisories 1/28/15:						

1000 (1/21/15)
19000 (1/21/15)
36000 (1/13/15)
37000 (1/13/15)
42000 (1/13/15)
rain (1/12/15)

RUN ON: 02/02/15

**WATER QUALITY RESULTS
FROM COLL DATE: 02/02/15
THRU COLL DATE: 02/02/15
LOCATION: ENVH, ENVH**

[illegible]

hotline 2/3/15
website 2/3/15
email HD + PWA
database

RUN ON: 02/09/15

**WATER QUALITY RESULTS
FROM COLL DATE: 02/09/15
THRU COLL DATE: 02/09/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 02/17/15

**WATER QUALITY RESULTS
FROM COLL DATE: 02/17/15
THRU COLL DATE: 02/17/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 02/23/15

**WATER QUALITY RESULTS
FROM COLL DATE: 02/23/15
THRU COLL DATE: 02/23/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 03/02/15

WATER QUALITY RESULTS
FROM COLL DATE: 03/02/15
THRU COLL DATE: 03/02/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
03/02/15	0915	OCEAN	EN,VH 1,000	10	<10	<10
03/02/15	0938	OCEAN	EN,VH 4,000	10	<10	<10
03/02/15	0946	OCEAN	EN,VH 7,000	109	<10	<10
03/02/15	1000	OCEAN	EN,VH 10,000	63	<10	10
03/02/15	1008	OCEAN	EN,VH 11,000	<10	<10	<10
03/02/15	1025	OCEAN	EN,VH 13,000	63	10	<10
03/02/15	1032	OCEAN	EN,VH 14,000	109	41	10
03/02/15	1050	OCEAN	EN,VH 19,000	3,255	<10	31
03/02/15	1108	OCEAN	EN,VH 25,000	130	10	10
03/02/15	1130	OCEAN	EN,VH 36,000	226	<10	10
03/02/15	1135	OCEAN	EN,VH 37,000	216	<10	42
03/02/15	1208	OCEAN	EN,VH 42,000	109	<10	<10
03/02/15	1330	OCEAN	LAB BLANK	<10	<10	<10
3/3/15	removed sign @		42000			
3/2/15	hotline / website / press release		(rain advisory)			
3/3/15	hotline / website		combined rain advisory + weekly results / no beaches posted			
	email		HD + PWA			
3/5/15	remove press release + update hotline / website		for 'no beaches posted only'			
3/3/15	upload 2/23 Rain advisory + 2/24 beach advisory		(42000)			
	create + upload rain advisory		3/3/15			
	Sampled by		Wahl			

upload lab data to SCCWRP

RUN ON: 03/09/15

WATER QUALITY RESULTS
FROM COLL DATE: 03/09/15
THRU COLL DATE: 03/09/15
LOCATION: ENVH, ENVH

[illegible]

RUN ON: 03/16/15

WATER QUALITY RESULTS
FROM COLL DATE: 03/16/15
THRU COLL DATE: 03/16/15
LOCATION: ENVH, ENVH

**WATER QUALITY RESULTS
FROM COLL DATE: 03/16/15
THRU COLL DATE: 03/16/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 03/23/15

WATER QUALITY RESULTS
FROM COLL DATE: 03/23/15
THRU COLL DATE: 03/23/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
03/23/15	0905	OCEAN	EN,VH 1,000	52	10	<10
03/23/15	0935	OCEAN	EN,VH 4,000	<10	<10	<10
03/23/15	0948	OCEAN	EN,VH 7,000	<10	<10	<10
03/23/15	1003	OCEAN	EN,VH 10,000	10	<10	<10
03/23/15	1012	OCEAN	EN,VH 11,000	<10	<10	<10
03/23/15	1030	OCEAN	EN,VH 13,000	142	<10	42
03/23/15	1038	OCEAN	EN,VH 14,000	221	10	<10
03/23/15	1052	OCEAN	EN,VH 19,000	20	10	<10
03/23/15	1111	OCEAN	EN,VH 25,000	<10	<10	<10
03/23/15	1147	OCEAN	EN,VH 36,000	<10	<10	<10
03/23/15	1154	OCEAN	EN,VH 37,000	20	<10	10
03/23/15	1228	OCEAN	EN,VH 42,000	<10	<10	<10
03/23/15	1330	OCEAN	LAB BLANK	<10	<10	<10

Website - 3/24

Hotline - 3/24

RUN ON: 03/30/15

Hotline	3/31/15
webcrt	3/31/15
email	HD + PWA
datawise	

RUN ON: 04/07/14

**WATER QUALITY RESULTS
FROM COLL DATE: 04/07/14
THRU COLL DATE: 04/07/14
LOCATION: ENVH, ENVH**

[illegible]

D

RUN ON: 04/14/15

**WATER QUALITY RESULTS
FROM COLL DATE: 04/14/15
THRU COLL DATE: 04/14/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 04/21/15

**WATER QUALITY RESULTS
FROM COLL DATE: 04/21/15
THRU COLL DATE: 04/21/15
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
04/21/15	0848	OCEAN	EN,VH 29,000	<10	<10	<10
04/21/15	0856	OCEAN	EN,VH 30,000	10	<10	10
04/21/15	0907	OCEAN	EN,VH 32,000	<10	<10	31
04/21/15	0911	OCEAN	EN,VH 33,000	<10	<10	<10
04/21/15	0921	OCEAN	EN,VH 34,000	<10	<10	<10
04/21/15	0928	OCEAN	EN,VH 35,000	<10	<10	<10
04/21/15	0945	OCEAN	EN,VH 36,000	52	20	<10
04/21/15	0948	OCEAN	EN,VH 37,000	96	52	31
04/21/15	1000	OCEAN	EN,VH 38,000	10	10	<10
04/21/15	1012	OCEAN	EN,VH 39,000	<10	<10	<10
04/21/15	1025	OCEAN	EN,VH 40,000	<10	<10	<10
04/21/15	1046	OCEAN	EN,VH 41,000	<10	<10	<10
04/21/15	1056	OCEAN	EN,VH 42,000	10	<10	<10
04/21/15	1105	OCEAN	EN,VH 43,000	<10	<10	<10
04/21/15	1138	OCEAN	EN,VH 44,000	31	<10	<10
04/21/15	1156	OCEAN	EN,VH 45,000	<10	<10	<10
04/21/15	1205	OCEAN	EN,VH 46,000	10	10	<10
04/21/15	1208	OCEAN	EN,VH 47,000	<10	<10	<10
04/21/15	1222	OCEAN	EN,VH 49,500	10	<10	<10
04/21/15	1236	OCEAN	EN,VH 50,000	10	10	<10
04/21/15	1300	OCEAN	LAB BLANK	<10	<10	<10
<i>Sampled by D. Wahl</i>						
<i>website 4/22/15</i>						
<i>hotline 4/22/15</i>						
<i>Email PW + HD</i>						
<i>database re</i>						

**WATER QUALITY RESULTS
FROM COLL DATE: 04/28/15
THRU COLL DATE: 04/28/15
LOCATION: ENVH, ENVH**

Sampled by white
website: 4/29/15
headline: 4/29/15
email PW + ID: 4/30/15
database: 4/30/15

RUN ON: 05/05/15

**WATER QUALITY RESULTS
FROM COLL DATE: 05/05/15
THRU COLL DATE: 05/05/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 05/12/15

WATER QUALITY RESULTS
FROM COLL DATE: 05/12/15
THRU COLL DATE: 05/12/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
05/12/15	0840	OCEAN	EN,VH 29,000	20	<10	<10
05/12/15	0852	OCEAN	EN,VH 30,000	<10	<10	<10
05/12/15	0907	OCEAN	EN,VH 32,000	<10	<10	<10
05/12/15	0915	OCEAN	EN,VH 33,000	<10	<10	<10
05/12/15	0925	OCEAN	EN,VH 34,000	<10	<10	<10
05/12/15	0935	OCEAN	EN,VH 35,000	<10	<10	<10
05/12/15	0952	OCEAN	EN,VH 36,000	10	<10	<10
05/12/15	0958	OCEAN	EN,VH 37,000	41	10	<10
05/12/15	1005	OCEAN	EN,VH 38,000	<10	<10	<10
05/12/15	1015	OCEAN	EN,VH 39,000	10	<10	<10
05/12/15	1020	OCEAN	EN,VH 40,000	<10	<10	<10
05/12/15	1048	OCEAN	EN,VH 41,000	<10	<10	<10
05/12/15	1106	OCEAN	EN,VH 42,000	<10	<10	<10
05/12/15	1112	OCEAN	EN,VH 43,000	<10	<10	<10
05/12/15	1120	OCEAN	EN,VH 44,000	<10	<10	<10
05/12/15	1148	OCEAN	EN,VH 45,000	110	10	<10
05/12/15	1155	OCEAN	EN,VH 46,000	<10	<10	<10
05/12/15	1201	OCEAN	EN,VH 47,000	<10	<10	<10
05/12/15	1210	OCEAN	EN,VH 49,500	<10	<10	<10
05/12/15	1225	OCEAN	EN,VH 50,000	<10	<10	<10
05/12/15	1330	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Talent						
website 5/13/15						
hotline 5/13/15						
email PWA + HD 5/14/15						

database 5/14/15

RUN ON: 05/19/15

WATER QUALITY RESULTS
FROM COLL DATE: 05/19/15
THRU COLL DATE: 05/19/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
05/19/15	0832	OCEAN	EN,VH 29,000	<10	<10	<10
05/19/15	0841	OCEAN	EN,VH 30,000	<10	<10	<10
05/19/15	0852	OCEAN	EN,VH 32,000	<10	<10	<10
05/19/15	0858	OCEAN	EN,VH 33,000	<10	<10	<10
05/19/15	0904	OCEAN	EN,VH 34,000	10	<10	<10
05/19/15	0910	OCEAN	EN,VH 35,000	10	<10	<10
05/19/15	0924	OCEAN	EN,VH 36,000	63	<10	<10
05/19/15	0930	OCEAN	EN,VH 37,000	10	10	53
05/19/15	0938	OCEAN	EN,VH 38,000	<10	<10	20
05/19/15	0945	OCEAN	EN,VH 39,000	1,210	<10	53
05/19/15	0952	OCEAN	EN,VH 40,000	<10	<10	<10
05/19/15	1016	OCEAN	EN,VH 41,000	10	<10	<10
05/19/15	1037	OCEAN	EN,VH 42,000	<10	<10	<10
05/19/15	1048	OCEAN	EN,VH 43,000	<10	<10	<10
05/19/15	1113	OCEAN	EN,VH 44,000	<10	<10	<10
05/19/15	1134	OCEAN	EN,VH 45,000	84	10	<10
05/19/15	1142	OCEAN	EN,VH 46,000	<10	<10	<10
05/19/15	1148	OCEAN	EN,VH 47,000	<10	<10	<10
05/19/15	1156	OCEAN	EN,VH 49,500	<10	<10	<10
05/19/15	1205	OCEAN	EN,VH 50,000	20	20	<10
05/19/15	1320	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Talent

hotline + website 4/20/15

email HD + PWA

abase

RUN ON: 05/26/15

WATER QUALITY RESULTS
FROM COLL DATE: 05/26/15
THRU COLL DATE: 05/26/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
05/26/15	0900	OCEAN	EN,VH 1,000	<10	<10	<10
05/26/15	0922	OCEAN	EN,VH 4,000	10	<10	10
05/26/15	0936	OCEAN	EN,VH 7,000	<10	<10	<10
05/26/15	0950	OCEAN	EN,VH 10,000	10	10	<10
05/26/15	1003	OCEAN	EN,VH 11,000	30	<10	384
05/26/15	1016	OCEAN	EN,VH 13,000	40	<10	<10
05/26/15	1033	OCEAN	EN,VH 14,000	20	<10	75
05/26/15	1042	OCEAN	EN,VH 19,000	10	<10	<10
05/26/15	1059	OCEAN	EN,VH 25,000	<10	<10	<10
05/26/15	1120	OCEAN	EN,VH 36,000	110	<10	<10
05/26/15	1129	OCEAN	EN,VH 37,000	1171	10	13
05/26/15	1218	OCEAN	EN,VH 42,000	<10	<10	<10
05/26/15	1300	OCEAN	EN,VH BLANK	<10	<10	<10
Holiday Schedule - Memorial Day						
Sampled by Wahl						
website + hotline 5/27/15						
press release 5/27/15						
posted @ sample 11000 (rocks) and at swing gate next to lifeguard station. (No resample collected)						
email HD + PWA						
database! data: 5/28/15						
advisory:						

pull posting:

RUN ON: 06/02/15

WATER QUALITY RESULTS
FROM COLL DATE: 06/02/15
THRU COLL DATE: 06/02/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
06/02/15	0846	OCEAN	EN,VH 29,000	<10	<10	<10
06/02/15	0852	OCEAN	EN,VH 30,000	<10	<10	<10
06/02/15	0902	OCEAN	EN,VH 32,000	<10	<10	<10
06/02/15	0904	OCEAN	EN,VH 33,000	<10	<10	<10
06/02/15	0913	OCEAN	EN,VH 34,000	63	<10	<10
06/02/15	0920	OCEAN	EN,VH 35,000	10	<10	<10
06/02/15	0933	OCEAN	EN,VH 36,000	<10	<10	<10
06/02/15	0941	OCEAN	EN,VH 37,000	266	156	42
06/02/15	0947	OCEAN	EN,VH 38,000	<10	<10	<10
06/02/15	0954	OCEAN	EN,VH 39,000	<10	<10	<10
06/02/15	1006	OCEAN	EN,VH 40,000	<10	<10	<10
06/02/15	1030	OCEAN	EN,VH 41,000	10	<10	<10
06/02/15	1035	OCEAN	EN,VH 42,000	41	<10	<10
06/02/15	1040	OCEAN	EN,VH 43,000	41	20	<10
06/02/15	1114	OCEAN	EN,VH 44,000	<10	<10	<10
06/02/15	1132	OCEAN	EN,VH 45,000	<10	<10	<10
06/02/15	1151	OCEAN	EN,VH 46,000	<10	<10	<10
06/02/15	1154	OCEAN	EN,VH 47,000	<10	<10	<10
06/02/15	1220	OCEAN	EN,VH 49,500	<10	<10	<10
06/02/15	1210	OCEAN	EN,VH 50,000	10	<10	<10
06/02/15	1320	OCEAN	LAB BLANK	<10	<10	<10

Sampled by lab

website + advisory updated 6/3/15 MT
hotline 6/2/15 MT

lab data / d base : 6/4/15

d base / advisories :

email HHD + PWA

RUN ON: 06/10/15

**WATER QUALITY RESULTS
FROM COLL DATE: 06/10/15
THRU COLL DATE: 06/10/15
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
		OCEAN	EN,VH 29,000			
		OCEAN	EN,VH 30,000			
		OCEAN	EN,VH 32,000			
		OCEAN	EN,VH 33,000			
		OCEAN	EN,VH 34,000			
		OCEAN	EN,VH 35,000			
06/10/15	1540	OCEAN	EN,VH 36,000	10	<10	10
		OCEAN	EN,VH 37,000			
		OCEAN	EN,VH 38,000			
		OCEAN	EN,VH 39,000			
		OCEAN	EN,VH 40,000			
		OCEAN	EN,VH 41,000			
		OCEAN	EN,VH 42,000			
		OCEAN	EN,VH 43,000			
		OCEAN	EN,VH 44,000			
		OCEAN	EN,VH 45,000			
		OCEAN	EN,VH 46,000			
		OCEAN	EN,VH 47,000			
		OCEAN	EN,VH 49,500			
		OCEAN	EN,VH 50,000			
06/10/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by D. Wahl						
Hotline: 6/12/15						
Website: 6/12/15						
Email: HD + PWA						

dbase : 6/12/15

RUN ON: 06/09/15

WATER QUALITY RESULTS
FROM COLL DATE: 06/09/15
THRU COLL DATE: 06/09/15
LOCATION: ENVH, ENVH

Date1000	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
06/09/15	0841	OCEAN	EN,VH 29,000	<10	<10	<10
06/09/15	0948	OCEAN	EN,VH 30,000	<10	<10	<10
06/09/15	0854	OCEAN	EN,VH 32,000	<10	<10	<10
06/09/15	0859	OCEAN	EN,VH 33,000	10	<10	<10
06/09/15	0903	OCEAN	EN,VH 34,000	<10	<10	10
06/09/15	0908	OCEAN	EN,VH 35,000	10	10	<10
06/09/15	0925	OCEAN	EN,VH 36,000	8,664	41	344
06/09/15	0929	OCEAN	EN,VH 37,000	120	<10	<10
06/09/15	0937	OCEAN	EN,VH 38,000	<10	<10	<10
06/09/15	0947	OCEAN	EN,VH 39,000	10	<10	<10
06/09/15	0952	OCEAN	EN,VH 40,000	20	10	<10
06/09/15	1023	OCEAN	EN,VH 41,000	75	<10	<10
06/09/15	1053	OCEAN	EN,VH 42,000	52	<10	<10
06/09/15	1059	OCEAN	EN,VH 43,000	20	<10	<10
06/09/15	1104	OCEAN	EN,VH 44,000	<10	<10	<10
06/09/15	1145	OCEAN	EN,VH 45,000	<10	<10	<10
06/09/15	1151	OCEAN	EN,VH 46,000	<10	<10	<10
06/09/15	1159	OCEAN	EN,VH 47,000	<10	<10	<10
06/09/15	1208	OCEAN	EN,VH 49,500	10	<10	<10
06/09/15	1219	OCEAN	EN,VH 50,000	10	<10	<10
06/09/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by M. Talant						
hotline: 6/10/15						
website: 6/10/15						
email: HD + PWA:						

rain advisory: 6/9/15 (website)
beach advisory: 6/10/15 (website)
pull rain advisory: 6/12/15
~~update rain advisory:~~
database - data: 6/11/15
database - rain advisory: 6/12/15
database - beach advisory: 6/12/15

RUN ON: 06/16/15

WATER QUALITY RESULTS
FROM COLL DATE: 06/16/15
THRU COLL DATE: 06/16/15
LOCATION: ENVH, ENVH

Date1000	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
06/16/15	0853	OCEAN	EN,VH 29,000	96	20	<10
06/16/15	0858	OCEAN	EN,VH 30,000	107	<10	<10
06/16/15	0906	OCEAN	EN,VH 32,000	20	<10	<10
06/16/15	0909	OCEAN	EN,VH 33,000	41	<10	<10
06/16/15	0920	OCEAN	EN,VH 34,000	10	<10	<10
06/16/15	0930	OCEAN	EN,VH 35,000	10	10	<10
06/16/15	0942	OCEAN	EN,VH 36,000	426	85	10
06/16/15	1000	OCEAN	EN,VH 37,000	62	20	87
06/16/15	0958	OCEAN	EN,VH 38,000	20	10	<10
06/16/15	1013	OCEAN	EN,VH 39,000	10	<10	<10
06/16/15	1015	OCEAN	EN,VH 40,000	<10	<10	<10
06/16/15	1045	OCEAN	EN,VH 41,000	41	41	<10
06/16/15	1053	OCEAN	EN,VH 42,000	20	10	10
06/16/15	1058	OCEAN	EN,VH 43,000	20	<10	10
06/16/15	1130	OCEAN	EN,VH 44,000	<10	<10	<10
06/16/15	1150	OCEAN	EN,VH 45,000	97	<10	<10
06/16/15	1200	OCEAN	EN,VH 46,000	30	<10	10
06/16/15	1206	OCEAN	EN,VH 47,000	<10	<10	<10
06/16/15	1232	OCEAN	EN,VH 49,500	<10	<10	<10
06/16/15	1225	OCEAN	EN,VH 50,000	63	<10	87
06/16/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by WJL						
hotline : 6/17/15						
website : (data + advisory page) : 6/17/15						
email HD + PWA :						

RUN ON: 06/23/15

website: 6/24/15
hotline: 6/24/15
email HD + AWA:
database: 6/25/15

**WATER QUALITY RESULTS
FROM COLL DATE: 06/30/15
THRU COLL DATE: 06/30/15
LOCATION: ENVH, ENVH**

Sampled by Wahl

website (data + advisory): 7/1/15

hotline:

email HD + PWA:

database:

RUN ON: 07/07/15

**WATER QUALITY RESULTS
FROM COLL DATE: 07/07/15
THRU COLL DATE: 07/07/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 07/14/15

WATER QUALITY RESULTS
FROM COLL DATE: 07/14/15
THRU COLL DATE: 07/14/15
LOCATION: ENVH, ENVH

Date1000	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
07/14/15	0846	OCEAN	EN,VH 29,000	<10	<10	<10
07/14/15	0852	OCEAN	EN,VH 30,000	<10	<10	<10
07/14/15	0858	OCEAN	EN,VH 32,000	<10	<10	<10
07/14/15	0903	OCEAN	EN,VH 33,000	<10	<10	<10
07/14/15	0911	OCEAN	EN,VH 34,000	<10	<10	<10
07/14/15	0919	OCEAN	EN,VH 35,000	<10	<10	<10
07/14/15	0937	OCEAN	EN,VH 36,000	86	20	<10
07/14/15	0945	OCEAN	EN,VH 37,000	10	<10	10
07/14/15	0952	OCEAN	EN,VH 38,000	20	<10	<10
07/14/15	1000	OCEAN	EN,VH 39,000	<10	<10	<10
07/14/15	****	OCEAN	EN,VH 40,000	NO	SAMPLE	COLLECTED
07/14/15	1029	OCEAN	EN,VH 41,000	96	10	10
07/14/15	1035	OCEAN	EN,VH 42,000	84	20	<10
07/14/15	1043	OCEAN	EN,VH 43,000	30	10	<10
07/14/15	1112	OCEAN	EN,VH 44,000	31	10	<10
07/14/15	1136	OCEAN	EN,VH 45,000	10	<10	<10
07/14/15	1143	OCEAN	EN,VH 46,000	<10	<10	<10
07/14/15	1149	OCEAN	EN,VH 47,000	<10	<10	<10
07/14/15	1214	OCEAN	EN,VH 49,500	10	<10	<10
07/14/15	1202	OCEAN	EN,VH 50,000	52	<10	<10
07/14/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Ward						
website (data + advisory): 7/15/15						
hotline: 7/15/15						
email HD + PWA:						

database: 7/16/15

RUN ON: 07/28/15

**WATER QUALITY RESULTS
FROM COLL DATE: 07/28/15
THRU COLL DATE: 07/28/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 08/04/15

RUN ON: 08/04/15

RUN ON: 08/11/15

WATER QUALITY RESULTS
FROM COLL DATE: 08/11/15
THRU COLL DATE: 08/11/15
LOCATION: ENVH, ENVH

Date1000	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
08/11/15	0815	OCEAN	EN,VH 29,000	10	10	<10
08/11/15	0820	OCEAN	EN,VH 30,000	41	10	<10
08/11/15	0828	OCEAN	EN,VH 32,000	<10	<10	<10
08/11/15	0830	OCEAN	EN,VH 33,000	20	20	<10
08/11/15	0840	OCEAN	EN,VH 34,000	41	10	<10
08/11/15	0847	OCEAN	EN,VH 35,000	20	20	<10
08/11/15	0858	OCEAN	EN,VH 36,000	122	<10	<10
08/11/15	0905	OCEAN	EN,VH 37,000	176	<10	10
08/11/15	0915	OCEAN	EN,VH 38,000	52	52	<10
08/11/15	0920	OCEAN	EN,VH 39,000	63	10	<10
08/11/15	0927	OCEAN	EN,VH 40,000	<10	<10	<10
08/11/15	0954	OCEAN	EN,VH 41,000	<10	<10	<10
08/11/15	1000	OCEAN	EN,VH 42,000	21	10	<10
08/11/15	1006	OCEAN	EN,VH 43,000	10	<10	<10
08/11/15	1017	OCEAN	EN,VH 44,000	10	<10	<10
08/11/15	1058	OCEAN	EN,VH 45,000	<10	<10	<10
08/11/15	1106	OCEAN	EN,VH 46,000	<10	<10	<10
08/11/15	1112	OCEAN	EN,VH 47,000	<10	<10	<10
08/11/15	1123	OCEAN	EN,VH 49,500	20	<10	<10
08/11/15	1134	OCEAN	EN,VH 50,000	20	10	10
08/11/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wahl						
Hotline : 8/11/15 (advisory) ; remove advisory : 8/12/15						
website (date) : 8/12/15						
website : (advisory) : update website advisory : 8/12/15						
website (log of postings) : close out dates on log of postings : 8/12/15						
email HD + PWA :						

database (date) : 8/13/15

remove ^{beach} postings : 8/12/15 (all 4 signs recovered)

**WATER QUALITY RESULTS
FROM COLL DATE: 08/18/15
THRU COLL DATE: 08/18/15
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
08/18/15	0756	OCEAN	EN,VH 29,000	20	<10	<10
08/18/15	0802	OCEAN	EN,VH 30,000	<10	<10	<10
08/18/15	0808	OCEAN	EN,VH 32,000	20	<10	<10
08/18/15	0813	OCEAN	EN,VH 33,000	10	<10	10
08/18/15	0822	OCEAN	EN,VH 34,000	52	<10	<10
08/18/15	0828	OCEAN	EN,VH 35,000	41	41	<10
08/18/15	0845	OCEAN	EN,VH 36,000	146	<10	<10
08/18/15	0850	OCEAN	EN,VH 37,000	345	31	<10
08/18/15	0900	OCEAN	EN,VH 38,000	20	10	20
08/18/15	0905	OCEAN	EN,VH 39,000	31	<10	<10
08/18/15	0910	OCEAN	EN,VH 40,000	10	<10	<10
08/18/15	0940	OCEAN	EN,VH 41,000	20	10	<10
08/18/15	0946	OCEAN	EN,VH 42,000	31	<10	<10
08/18/15	0852	OCEAN	EN,VH 43,000	74	10	<10
08/18/15	1003	OCEAN	EN,VH 44,000	41	31	<10
08/18/15	1046	OCEAN	EN,VH 45,000	20	10	<10
08/18/15	1053	OCEAN	EN,VH 46,000	20	20	<10
08/18/15	1057	OCEAN	EN,VH 47,000	31	<10	<10
08/18/15	1106	OCEAN	EN,VH 49,500	41	<10	<10
08/18/15	1118	OCEAN	EN,VH 50,000	20	<10	<10
08/18/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by: [Signature]						
Indet. holding: 8/19/15 MT						
website: 8/19/15 MT						
Removal postiv: 8/19/15 MT						
email HB + PWA:						
date base (date + advisory):						

RUN ON: 08/25/15

Sampled by	Label
	(1)
website (date):	8/26/15
email HN + PWA:	8/27/15
hotline:	8/26/15
chase (date):	8/27/15

RUN ON: 09/01/15

**WATER QUALITY RESULTS
FROM COLL DATE: 09/01/15
THRU COLL DATE: 09/01/15
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 09/8/15

WATER QUALITY RESULTS
FROM COLL DATE: 09/08/15
THRU COLL DATE: 09/08/15
LOCATION: ENVH, ENVH

*Holiday/Wet
Weather Sampling
Schedule*

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
09/08/15	****	OCEAN	EN,VH 1,000	NO	SAMPLE	COLLECTED
09/08/15	0830	OCEAN	EN,VH 4,000	<10	<10	<10
09/08/15	0840	OCEAN	EN,VH 7,000	<10	<10	<10
09/08/15	0857	OCEAN	EN,VH 10,000	31	20	<10
09/08/15	0909	OCEAN	EN,VH 11,000	<10	<10	<10
09/08/15	0925	OCEAN	EN,VH 13,000	10	10	<10
09/08/15	0934	OCEAN	EN,VH 14,000	20	<10	<10
09/08/15	0948	OCEAN	EN,VH 19,000	<10	<10	<10
09/08/15	1007	OCEAN	EN,VH 25,000	10	<10	<10
09/08/15	1028	OCEAN	EN,VH 35,000	<10	<10	<10
09/08/15	1043	OCEAN	EN,VH 36,000	20	<10	<10
09/08/15	1048	OCEAN	EN,VH 37,000	168	41	<10
09/08/15	1108	OCEAN	EN,VH 38,000	31	10	<10
09/08/15	1114	OCEAN	EN,VH 39,000	<10	<10	<10
09/08/15	1121	OCEAN	EN,VH 40,000	2,064	2,064	885
09/08/15	1155	OCEAN	EN,VH 41,000	41	10	20
09/08/15	1200	OCEAN	EN,VH 42,000	<10	<10	<10
09/08/15	1207	OCEAN	EN,VH 43,000	<10	<10	<10
09/08/15	1243	OCEAN	EN,VH 44,000	10	<10	<10
09/08/15	1330	OCEAN	LAB BLANK	<10	<10	<10
Sampled by D. Wahl						

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posted 2 signs: 9/9/15 (not resampled this date) (one sign placed on upper beach in front of drain, The second on lower beach in front of drain.)

press release: 9/9/15

website (data + advisory): 9/9/15

hotline: 9/9/15

database (data): 9/10/15

database (advisory):

pull signs:

email HD + PWA:

pull P.R. off website:

Rcd 9/18/15

RUN ON: 09/16/15

WATER QUALITY RESULTS
FROM COLL DATE: 09/16/15
THRU COLL DATE: 09/16/15
LOCATION: ENVH, ENVH

Date1000	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml	
09/16/15	1448	OCEAN	EN,VH 29,000	>24,196	402	53	
09/16/15	1204	OCEAN	EN,VH 30,000	259	10	<10	pass
		OCEAN	EN,VH 32,000				
		OCEAN	EN,VH 33,000				
		OCEAN	EN,VH 34,000				
		OCEAN	EN,VH 35,000				
09/16/15	1220	OCEAN	EN,VH 36,000	>24,196	1,722	111	
09/16/15	1248	OCEAN	EN,VH 37,000	>24,196	2,495	64	+ ratio
09/16/15	1507	OCEAN	EN,VH 38,000	465	41	10	* pass
		OCEAN	EN,VH 39,000				
09/16/15	1520	OCEAN	EN,VH 40,000	96	<10	10	pass
		OCEAN	EN,VH 41,000				
		OCEAN	EN,VH 42,000				
		OCEAN	EN,VH 43,000				
		OCEAN	EN,VH 44,000				
		OCEAN	EN,VH 45,000				
		OCEAN	EN,VH 46,000				
		OCEAN	EN,VH 47,000				
		OCEAN	EN,VH 49,500				
		OCEAN	EN,VH 50,000				
09/16/15	1400	OCEAN	LAB BLANK	<10	<10	<10	
Sampled by Wohl							
Website (data - advisories): 9/18/15							
Website (log): 9/18/15							
Hotline: 9/18/15							

email HD + PWA: 9/18/15

database (advisories): 9/18/15

database (data): 9/18/15

* disregard. Original sample never failed. resample unnecessary. Lab miscommunication.
 Postings removed 9/16/15.

RUN ON: 09/22/15

Soundex by: Wahl			
website: 9/23/15			
hotline: 9/23/15			
pull posts: 29000, 36000, 37000: 9/23/15			
remove press release: 9/23/15			
email HD + PWA: 9/24/15			
Beachwatch (dotz): 9/24/15			
Beachwatch (advisorial): 9/23/15 (close date for 29000, 36000, 37000)			

RUN ON: 09/29/15

WATER QUALITY RESULTS
FROM COLL DATE: 09/29/15
THRU COLL DATE: 09/29/15
LOCATION: ENVH, ENVH

Date1000	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
09/29/15	0812	OCEAN	EN,VH 29,000	41	<10	<10
09/29/15	0819	OCEAN	EN,VH 30,000	41	<10	<10
09/29/15	0828	OCEAN	EN,VH 32,000	84	<10	<10
09/29/15	0831	OCEAN	EN,VH 33,000	179	<10	<10
09/29/15	0841	OCEAN	EN,VH 34,000	95	<10	53
09/29/15	0849	OCEAN	EN,VH 35,000	10	<10	<10
09/29/15	0906	OCEAN	EN,VH 36,000	121	<10	20
09/29/15	0911	OCEAN	EN,VH 37,000	153	10	<10
09/29/15	0921	OCEAN	EN,VH 38,000	52	<10	<10
09/29/15	0928	OCEAN	EN,VH 39,000	30	<10	<10
09/29/15	0937	OCEAN	EN,VH 40,000	20	<10	<10
09/29/15	1008	OCEAN	EN,VH 41,000	74	20	20
09/29/15	1014	OCEAN	EN,VH 42,000	86	31	31
09/29/15	1021	OCEAN	EN,VH 43,000	228	31	20
09/29/15	1056	OCEAN	EN,VH 44,000	61	10	10
09/29/15	1116	OCEAN	EN,VH 45,000	158	41	<10
09/29/15	1122	OCEAN	EN,VH 46,000	92	30	<10
09/29/15	1130	OCEAN	EN,VH 47,000	86	31	<10
09/29/15	1140	OCEAN	EN,VH 49,500	408	52	87
09/29/15	1151	OCEAN	EN,VH 50,000	2,282	767	20
09/29/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by: [illegible]						
Website (data + advisory): 9/30/15						
headline: 9/30/15						
email: HD + PWA:						
Beach Watch: 9/30/15 (data)						
post + resample: 9/30/15 (one post @ base of footpath)						

Beach Watch:

remove post:

press release: 10/1/15

remove press release:

Handwritten red note: - monitor

RUN ON: 10/07/15

Sampled by Wiche

Signs pulled (31/000/37000): 17/8/15

Wohl: 10/8/15

Email HD + PWA:

Beach water (data): 10/8/15

website (data/advisory/log): 10/8/15

RUN ON: 10/13/15

WATER QUALITY RESULTS
FROM COLL DATE: 10/13/15
THRU COLL DATE: 10/13/15
LOCATION: ENVH, ENVH

Date1000	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
10/13/15	1105	OCEAN	EN,VH 29,000	20	<10	<10
10/13/15	1053	OCEAN	EN,VH 30,000	30	<10	10
10/13/15	1045	OCEAN	EN,VH 32,000	20	<10	<10
10/13/15	1041	OCEAN	EN,VH 33,000	10	<10	10
10/13/15	1032	OCEAN	EN,VH 34,000	84	10	<10
10/13/15	1026	OCEAN	EN,VH 35,000	10	<10	<10
10/13/15	0940	OCEAN	EN,VH 36,000	457	63	<10
10/13/15	0943	OCEAN	EN,VH 37,000	408	134	42
10/13/15	0950	OCEAN	EN,VH 38,000	435	148	20
10/13/15	0957	OCEAN	EN,VH 39,000	20	10	10
10/13/15	1003	OCEAN	EN,VH 40,000	52	10	20
10/13/15	0917	OCEAN	EN,VH 41,000	20	<10	<10
10/13/15	0912	OCEAN	EN,VH 42,000	74	<10	<10
10/13/15	0905	OCEAN	EN,VH 43,000	181	10	<10
10/13/15	0835	OCEAN	EN,VH 44,000	30	<10	<10
10/13/15	0811	OCEAN	EN,VH 45,000	132	<10	<10
10/13/15	0753	OCEAN	EN,VH 46,000	41	<10	<10
10/13/15	0800	OCEAN	EN,VH 47,000	84	<10	<10
10/13/15	0745	OCEAN	EN,VH 49,500	119	<10	<10
10/13/15	0740	OCEAN	EN,VH 50,000	92	10	<10
10/13/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled - 12 hrs						
waterbath (date): 10/14/15						
arrival HD + PWA:						
hotline: 10/14/15						
Beachwatch (date): 10/15/15						

RUN ON: 10/20/15

**WATER QUALITY RESULTS
FROM COLL DATE: 10/20/15
THRU COLL DATE: 10/20/15
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
10/20/15	1200	OCEAN	EN,VH 29,000	1,376	10	10
10/20/15	1150	OCEAN	EN,VH 30,000	631	<10	<10
10/20/15	1140	OCEAN	EN,VH 32,000	677	<10	<10
10/20/15	1135	OCEAN	EN,VH 33,000	663	10	<10
10/20/15	1126	OCEAN	EN,VH 34,000	565	<10	<10
10/20/15	1120	OCEAN	EN,VH 35,000	426	<10	<10
10/20/15	1038	OCEAN	EN,VH 36,000	110	<10	<10
10/20/15	1042	OCEAN	EN,VH 37,000	156	<10	<10
10/20/15	1046	OCEAN	EN,VH 38,000	364	<10	<10
10/20/15	1050	OCEAN	EN,VH 39,000	631	<10	<10
10/20/15	1056	OCEAN	EN,VH 40,000	313	<10	<10
10/20/15	1024	OCEAN	EN,VH 41,000	269	<10	10
10/20/15	1018	OCEAN	EN,VH 42,000	384	30	<10
10/20/15	1010	OCEAN	EN,VH 43,000	243	20	<10
10/20/15	0940	OCEAN	EN,VH 44,000	288	<10	<10
10/20/15	0836	OCEAN	EN,VH 45,000	97	<10	<10
10/20/15	0843	OCEAN	EN,VH 46,000	75	41	<10
10/20/15	0850	OCEAN	EN,VH 47,000	135	10	10
10/20/15	0900	OCEAN	EN,VH 49,500	135	<10	<10
10/20/15	0910	OCEAN	EN,VH 50,000	110	<10	<10
10/20/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by L2H2						
Hotline: 10/21/15						
website (date): 10/21/15						
website (advisor): 10/21/15						
email: HD + PWA						
beachwatch:						

RUN ON: 10/27/15

**WATER QUALITY RESULTS
FROM COLL DATE: 10/27/15
THRU COLL DATE: 10/27/15
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
10/27/15	1146	OCEAN	EN,VH 29,000	75	10	31
10/27/15	1137	OCEAN	EN,VH 30,000	20	20	20
10/27/15	1127	OCEAN	EN,VH 32,000	41	<10	20
10/27/15	1122	OCEAN	EN,VH 33,000	<10	<10	<10
10/27/15	1107	OCEAN	EN,VH 34,000	20	<10	<10
10/27/15	1112	OCEAN	EN,VH 35,000	10	<10	<10
10/27/15	1019	OCEAN	EN,VH 36,000	10	<10	<10
10/27/15	1024	OCEAN	EN,VH 37,000	576	295	42
10/27/15	1030	OCEAN	EN,VH 38,000	345	86	75
10/27/15	1038	OCEAN	EN,VH 39,000	107	10	20
10/27/15	1045	OCEAN	EN,VH 40,000	75	41	31
10/27/15	0935	OCEAN	EN,VH 41,000	98	20	10
10/27/15	0942	OCEAN	EN,VH 42,000	10	<10	10
10/27/15	0950	OCEAN	EN,VH 43,000	52	10	20
10/27/15	0903	OCEAN	EN,VH 44,000	52	<10	20
10/27/15	0757	OCEAN	EN,VH 45,000	355	31	<10
10/27/15	0803	OCEAN	EN,VH 46,000	41	<10	<10
10/27/15	0840	OCEAN	EN,VH 47,000	52	10	<10
10/27/15	0813	OCEAN	EN,VH 49,500	31	<10	10
10/27/15	0826	OCEAN	EN,VH 50,000	<10	<10	<10
10/27/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by: (initials)						
Update website (data):			10/28/15			
Hotline: N/A (done 10/27)						
email H-D + PWA:						
Beach Watch (data):			10/28/15			

RUN ON: 11/02/15

WATER QUALITY RESULTS
FROM COLL DATE: 11/02/15
THRU COLL DATE: 11/02/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
11/02/15	0804	OCEAN	EN,VH 1,000	20	10	<10
11/02/15	0833	OCEAN	EN,VH 4,000	<10	<10	<10
11/02/15	0848	OCEAN	EN,VH 7,000	10	<10	<10
11/02/15	0855	OCEAN	EN,VH 10,000	20	10	<10
11/02/15	0904	OCEAN	EN,VH 11,000	10	<10	<10
11/02/15	0916	OCEAN	EN,VH 13,000	985	<10	10
11/02/15	0926	OCEAN	EN,VH 14,000	97	<10	10
11/02/15	0934	OCEAN	EN,VH 19,000	20	<10	<10
11/02/15	0952	OCEAN	EN,VH 25,000	41	<10	<10
11/02/15	1014	OCEAN	EN,VH 35,000	<10	<10	<10
11/02/15	1028	OCEAN	EN,VH 36,000	20	<10	20
11/02/15	1034	OCEAN	EN,VH 37,000	146	75	31
11/02/15	1039	OCEAN	EN,VH 38,000	63	<10	<10
11/02/15	1043	OCEAN	EN,VH 39,000	31	10	<10
11/02/15	1047	OCEAN	EN,VH 40,000	10	10	<10
11/02/15	1124	OCEAN	EN,VH 41,000	41	10	10
11/02/15	1132	OCEAN	EN,VH 42,000	31	10	<10
11/02/15	1138	OCEAN	EN,VH 43,000	20	10	20
11/02/15	1203	OCEAN	EN,VH 44,000	10	10	10
11/02/15	1310	OCEAN	LAB BLANK	10	10	<10

Sampled by label

1

Hotline / website : 11/3/15

Email HD + PW A :

Beachwatcher 11/4/15

RUN ON: 11/09/15

WATER QUALITY RESULTS
FROM COLL DATE: 11/09/15
THRU COLL DATE: 11/09/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
11/09/15	0837	OCEAN	EN,VH 1,000	<10	<10	20
11/09/15	0903	OCEAN	EN,VH 4,000	41	<10	<10
11/09/15	0915	OCEAN	EN,VH 7,000	110	31	10
11/09/15	0928	OCEAN	EN,VH 10,000	31	<10	10
11/09/15	0940	OCEAN	EN,VH 11,000	<10	<10	<10
11/09/15	0950	OCEAN	EN,VH 13,000	10	<10	<10
11/09/15	1002	OCEAN	EN,VH 14,000	31	20	<10
11/09/15	1015	OCEAN	EN,VH 19,000	<10	<10	42
11/09/15	1030	OCEAN	EN,VH 25,000	10	<10	<10
11/09/15	1100	OCEAN	EN,VH 35,000	31	10	<10
11/09/15	1113	OCEAN	EN,VH 36,000	226	10	53
11/09/15	1118	OCEAN	EN,VH 37,000	323	226	99
11/09/15	1128	OCEAN	EN,VH 38,000	<10	<10	<10
11/09/15	1136	OCEAN	EN,VH 39,000	31	<10	10
11/09/15	1140	OCEAN	EN,VH 40,000	<10	<10	<10
11/09/15	1200	OCEAN	EN,VH 41,000	63	10	<10
11/09/15	1205	OCEAN	EN,VH 42,000	20	10	<10
11/09/15	1211	OCEAN	EN,VH 43,000	31	20	10
11/09/15	1220	OCEAN	EN,VH 44,000	10	10	<10
11/09/15	1300	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Water

1

website (data/advisory): 11/10/15

hotline: 11/10/15

email HD + PWA:

BeachWatch (data): 11/10/15

RUN ON: 11/17/15

WATER QUALITY RESULTS
FROM COLL DATE: 11/17/15
THRU COLL DATE: 11/17/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
03/17/15	0837	OCEAN	EN,VH 1,000	<10	<10	<10
03/17/15	0910	OCEAN	EN,VH 4,000	<10	<10	<10
03/17/15	0919	OCEAN	EN,VH 7,000	<10	<10	<10
03/17/15	0925	OCEAN	EN,VH 10,000	20	<10	<10
03/17/15	0933	OCEAN	EN,VH 11,000	<10	<10	<10
03/17/15	0945	OCEAN	EN,VH 13,000	<10	<10	<10
03/17/15	0957	OCEAN	EN,VH 14,000	<10	<10	<10
03/17/15	1010	OCEAN	EN,VH 19,000	98	<10	<10
03/17/15	1024	OCEAN	EN,VH 25,000	10	<10	<10
03/17/15	1058	OCEAN	EN,VH 35,000	<10	<10	<10
03/17/15	1110	OCEAN	EN,VH 36,000	<10	<10	<10
03/17/15	1115	OCEAN	EN,VH 37,000	565	305	531
03/17/15	1118	OCEAN	EN,VH 38,000	<10	<10	<10
03/17/15	1124	OCEAN	EN,VH 39,000	<10	<10	<10
03/17/15	1129	OCEAN	EN,VH 40,000	<10	<10	<10
03/17/15	1200	OCEAN	EN,VH 41,000	146	20	10
03/17/15	1205	OCEAN	EN,VH 42,000	75	20	10
03/17/15	1210	OCEAN	EN,VH 43,000	30	10	<10
03/17/15	1238	OCEAN	EN,VH 44,000	10	10	<10
03/17/15	1300	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Wahl

hotline: 11/19/15 (a.m.)

website: 11/19/15 (a.m.)

posting: 11/18/15 Ernie

Beachwatch (advisory) ^{open}: 11/19/15 (data): 11/19/15

email HD + PWA: 11/19/15

Press Release: 11/19/15 (a.m.)

Pull posting:

Pull press release:

Beachwatch (close advisory):

RUN ON: 11/23/15

WATER QUALITY RESULTS
FROM COLL DATE: 11/23/15
THRU COLL DATE: 11/23/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
11/23/15	0825	OCEAN	EN,VH 1,000	<10	<10	<10
11/23/15	0855	OCEAN	EN,VH 4,000	10	10	10
11/23/15	0908	OCEAN	EN,VH 7,000	10	<10	10
11/23/15	0915	OCEAN	EN,VH 10,000	86	10	<10
11/23/15	0925	OCEAN	EN,VH 11,000	31	10	10
11/23/15	0943	OCEAN	EN,VH 13,000	52	31	<10
11/23/15	0957	OCEAN	EN,VH 14,000	10	<10	<10
11/23/15	1011	OCEAN	EN,VH 19,000	20	<10	10
11/23/15	1030	OCEAN	EN,VH 25,000	10	<10	<10
11/23/15	1058	OCEAN	EN,VH 35,000	<10	<10	<10
11/23/15	1114	OCEAN	EN,VH 36,000	20	<10	<10
11/23/15	1123	OCEAN	EN,VH 37,000	10	10	<10
11/23/15	1126	OCEAN	EN,VH 38,000	<10	<10	<10
11/23/15	1132	OCEAN	EN,VH 39,000	<10	<10	<10
11/23/15	1136	OCEAN	EN,VH 40,000	<10	<10	<10
11/23/15	1214	OCEAN	EN,VH 41,000	63	10	42
11/23/15	1222	OCEAN	EN,VH 42,000	10	<10	<10
11/23/15	1228	OCEAN	EN,VH 43,000	<10	<10	<10
11/23/15	1240	OCEAN	EN,VH 44,000	20	<10	<10
11/23/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wale						

hotline: 11/24/15

website (data + close advisory): 11/24/15

pull last week's press release: 11/24/15

email HD + PWA:

Beachwatcher data: 11/25/15

pull sign@37000: 11/24/15

RUN ON: 11/30/15

WATER QUALITY RESULTS
FROM COLL DATE: 11/30/15
THRU COLL DATE: 11/30/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
11/30/15	0834	OCEAN	EN,VH 1,000	20	<10	<10
11/30/15	0853	OCEAN	EN,VH 4,000	10	<10	<10
11/30/15	0910	OCEAN	EN,VH 7,000	<10	<10	<10
11/30/15	0918	OCEAN	EN,VH 10,000	30	30	<10
11/30/15	0930	OCEAN	EN,VH 11,000	<10	<10	<10
11/30/15	0942	OCEAN	EN,VH 13,000	20	10	<10
11/30/15	0956	OCEAN	EN,VH 14,000	<10	<10	<10
11/30/15	1008	OCEAN	EN,VH 19,000	86	41	<10
11/30/15	1023	OCEAN	EN,VH 25,000	10	<10	<10
11/30/15	1054	OCEAN	EN,VH 35,000	10	<10	<10
11/30/15	1108	OCEAN	EN,VH 36,000	20	<10	<10
11/30/15	1115	OCEAN	EN,VH 37,000	<10	<10	<10
11/30/15	1122	OCEAN	EN,VH 38,000	20	<10	<10
11/30/15	1129	OCEAN	EN,VH 39,000	<10	<10	<10
11/30/15	1136	OCEAN	EN,VH 40,000	<10	<10	<10
11/30/15	1207	OCEAN	EN,VH 41,000	98	31	<10
11/30/15	1215	OCEAN	EN,VH 42,000	41	20	<10
11/30/15	1220	OCEAN	EN,VH 43,000	<10	<10	<10
11/30/15	1245	OCEAN	EN,VH 44,000	<10	<10	<10
11/30/15	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wiche						

website (advisory → date): 12/1/15

hotline: 12/1/15

beachwatch (date): 12/1/15

email PWA + HD: 12/1/15

RUN ON: 12/07/15

WATER QUALITY RESULTS
FROM COLL DATE: 12/07/15
THRU COLL DATE: 12/07/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
12/07/15	0840	OCEAN	EN,VH 1,000	41	31	<10
12/07/15	0925	OCEAN	EN,VH 4,000	10	<10	<10
12/07/15	0935	OCEAN	EN,VH 7,000	<10	<10	<10
12/07/15	0948	OCEAN	EN,VH 10,000	109	63	<10
12/07/15	0957	OCEAN	EN,VH 11,000	10	<10	<10
12/07/15	1010	OCEAN	EN,VH 13,000	<10	<10	<10
12/07/15	1022	OCEAN	EN,VH 14,000	20	<10	<10
12/07/15	1033	OCEAN	EN,VH 19,000	52	<10	<10
12/07/15	1050	OCEAN	EN,VH 25,000	108	41	20
12/07/15	1116	OCEAN	EN,VH 35,000	<10	<10	<10
12/07/15	1130	OCEAN	EN,VH 36,000	233	20	<10
12/07/15	1136	OCEAN	EN,VH 37,000	439	10	<10
12/07/15	1146	OCEAN	EN,VH 38,000	41	10	10
12/07/15	1157	OCEAN	EN,VH 39,000	41	<10	<10
12/07/15	1205	OCEAN	EN,VH 40,000	20	<10	<10
12/07/15	1227	OCEAN	EN,VH 41,000	75	41	20
12/07/15	1233	OCEAN	EN,VH 42,000	10	10	10
12/07/15	1237	OCEAN	EN,VH 43,000	75	20	20
12/07/15	1248	OCEAN	EN,VH 44,000	20	20	<10
12/07/15	1315	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Wahl/Custer

website (advisory + data): 12/8

hotline: 12/8

email HD + PWA:

beachwatch (data):

RUN ON: 12/15/15

WATER QUALITY RESULTS
FROM COLL DATE: 12/15/15
THRU COLL DATE: 12/15/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
12/15/15	0842	OCEAN	EN,VH 1,000	10	10	<10
12/15/15	0905	OCEAN	EN,VH 4,000	10	<10	<10
12/15/15	0925	OCEAN	EN,VH 7,000	10	<10	<10
12/15/15	0933	OCEAN	EN,VH 10,000	10	10	<10
12/15/15	0945	OCEAN	EN,VH 11,000	10	10	<10
12/15/15	0958	OCEAN	EN,VH 13,000	20	<10	<10
12/15/15	1005	OCEAN	EN,VH 14,000	10	<10	<10
12/15/15	1026	OCEAN	EN,VH 19,000	7,701	63	<10
12/15/15	1042	OCEAN	EN,VH 25,000	41	10	<10
12/15/15	1120	OCEAN	EN,VH 35,000	<10	<10	<10
12/15/15	1138	OCEAN	EN,VH 36,000	20	<10	<10
12/15/15	1146	OCEAN	EN,VH 37,000	74	<10	<10
12/15/15	1149	OCEAN	EN,VH 38,000	10	<10	<10
12/15/15	1155	OCEAN	EN,VH 39,000	31	<10	<10
12/15/15	1200	OCEAN	EN,VH 40,000	20	<10	<10
12/15/15	1224	OCEAN	EN,VH 41,000	20	10	<10
12/15/15	1229	OCEAN	EN,VH 42,000	10	<10	<10
12/15/15	1234	OCEAN	EN,VH 43,000	41	20	<10
12/15/15	1256	OCEAN	EN,VH 44,000	<10	<10	<10
12/15/15	1315	OCEAN	LAB BLANK	<10	<10	<10
Sampled by DBW						

Website (data + advisory): 12/16/15

Hotline: 12/16/15

Email: HHD + PWA: 12/14/15

Beachwatch: 12/16/15

Mon. 12/14 High surf advisory,
 postpone sampling to 12/15 (Tues).

RUN ON: 12/22/15

WATER QUALITY RESULTS
FROM COLL DATE: 12/22/15
THRU COLL DATE: 12/22/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
12/22/15	0840	OCEAN	EN,VH 1,000	62	<10	31
12/22/15	0908	OCEAN	EN,VH 4,000	98	86	10
12/22/15	0922	OCEAN	EN,VH 7,000	52	10	<10
12/22/15	0930	OCEAN	EN,VH 10,000	<10	<10	<10
12/22/15	0938	OCEAN	EN,VH 11,000	20	<10	<10
12/22/15	0951	OCEAN	EN,VH 13,000	640	41	42
12/22/15	1004	OCEAN	EN,VH 14,000	181	<10	31
12/22/15	1018	OCEAN	EN,VH 19,000	1,291	148	150
12/22/15	1032	OCEAN	EN,VH 25,000	231	86	313
12/22/15	1102	OCEAN	EN,VH 35,000	86	<10	<10
12/22/15	1116	OCEAN	EN,VH 36,000	246	10	<10
12/22/15	1120	OCEAN	EN,VH 37,000	336	<10	20
12/22/15	1128	OCEAN	EN,VH 38,000	63	31	<10
12/22/15	1134	OCEAN	EN,VH 39,000	41	10	<10
12/22/15	1140	OCEAN	EN,VH 40,000	108	<10	10
12/22/15	1210	OCEAN	EN,VH 41,000	98	52	10
12/22/15	1216	OCEAN	EN,VH 42,000	97	10	10
12/22/15	1221	OCEAN	EN,VH 43,000	63	20	20
12/22/15	1232	OCEAN	EN,VH 44,000	63	10	<10
12/22/15	1315	OCEAN	LAB BLANK	<10	<10	<10
Sampled on Tues. 12/22 - White						

hotline: updated 12/28/15

website: 12/23/15

posted: 12/23/15 1 sign @ each locations

postings removed: 12/29/15

email HD + PWA: 12/29/15

Beach Watch (data): 12/29/15
(advisories): 12/29/15

RUN ON: 12/28/15

WATER QUALITY RESULTS
FROM COLL DATE: 12/28/15
THRU COLL DATE: 12/28/15
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MP N/100 ml
12/28/15	0844	OCEAN	ENVH 1000	51	51	<10
12/28/15	0913	OCEAN	ENVH 4000	20	20	20
12/28/15	0925	OCEAN	ENVH 7000	52	10	<10
12/28/15	0938	OCEAN	ENVH 10000	<10	<10	<10
12/28/15	0945	OCEAN	ENVH 11000	20	20	10
12/28/15	1002	OCEAN	ENVH 13000	<10	<10	<10
12/28/15	1016	OCEAN	ENVH 14000	<10	<10	<10
12/28/15	1030	OCEAN	ENVH 19000	<10	<10	<10
12/28/15	1044	OCEAN	ENVH 25000	10	10	<10
12/28/15	1113	OCEAN	ENVH 35000	<10	<10	10
12/28/15	1125	OCEAN	ENVH 36000	<10	<10	10
12/28/15	1130	OCEAN	ENVH 37000	<10	<10	<10
12/28/15	1137	OCEAN	ENVH 38000	<10	<10	<10
12/28/15	1144	OCEAN	ENVH 39000	<10	<10	<10
12/28/15	1149	OCEAN	ENVH 40000	<10	<10	<10
12/28/15	1214	OCEAN	ENVH 41000	<10	<10	<10
12/28/15	1218	OCEAN	ENVH 42000	<10	<10	10
12/28/15	1223	OCEAN	ENVH 43000	<10	<10	<10
12/28/15	1242	OCEAN	ENVH 44000	<10	<10	<10
12/28/15	1300	OCEAN	ENVH LAB BLANK	<10	<10	<10
Sampled by Wahl						
website (data/advisory/log): 12/29/15						
hotline: 12/29/15						
email H&P + PWA:						
Pull posts: 12/29/15						
BeachWatch (data + advisory): 12/29/15						

RUN ON: 01/04/16

WATER QUALITY RESULTS
FROM COLL DATE: 01/04/16
THRU COLL DATE: 01/04/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
01/04/16	0900	OCEAN	EN,VH 1,000	<10	<10	<10
01/04/16	0918	OCEAN	EN,VH 4,000	<10	<10	<10
01/04/16	0941	OCEAN	EN,VH 7,000	<10	<10	<10
01/04/16	0949	OCEAN	EN,VH 10,000	10	<10	<10
01/04/16	1003	OCEAN	EN,VH 11,000	<10	<10	<10
01/04/16	1021	OCEAN	EN,VH 13,000	<10	<10	<10
01/04/16	1033	OCEAN	EN,VH 14,000	20	10	<10
01/04/16	1051	OCEAN	EN,VH 19,000	10	<10	<10
01/04/16	1120	OCEAN	EN,VH 25,000	63	31	10
01/04/16	1153	OCEAN	EN,VH 35,000	<10	<10	10
01/04/16	1203	OCEAN	EN,VH 36,000	41	10	10
01/04/16	1208	OCEAN	EN,VH 37,000	86	75	306
01/04/16	1217	OCEAN	EN,VH 38,000	<10	<10	<10
01/04/16	1234	OCEAN	EN,VH 39,000	<10	<10	<10
01/04/16	1241	OCEAN	EN,VH 40,000	<10	<10	<10
01/04/16	1308	OCEAN	EN,VH 41,000	109	52	10
01/04/16	1323	OCEAN	EN,VH 42,000	<10	<10	<10
01/04/16	1330	OCEAN	EN,VH 43,000	20	<10	<10
01/04/16	1339	OCEAN	EN,VH 44,000	<10	<10	<10
01/04/16	1400	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Oregon						

website (data): 1/5/16
 (rain advisory): 1/5/16
 website log of posts (rain + 37000): 1/5/16
 hotline (rain): 1/5/16
 press release (rain): 1/5/16
 post (37000): 1/5/16
 email HD + PSA: 1/5/16
 Beach Watch (data):
 (advisory + rain/37000):

No Big 13' samples
 collected this week

RUN ON: 01/11/16

WATER QUALITY RESULTS
FROM COLL DATE: 01/11/16
THRU COLL DATE: 01/11/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
01/11/16	0835	OCEAN	EN,VH 1,000	74	<10	<10
01/11/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
01/11/16	0920	OCEAN	EN,VH 7,000	305	<10	<10
01/11/16	0931	OCEAN	EN,VH 10,000	644	<10	<10
01/11/16	0941	OCEAN	EN,VH 11,000	52	<10	<10
01/11/16	0955	OCEAN	EN,VH 13,000	41	<10	<10
01/11/16	1006	OCEAN	EN,VH 14,000	72	10	<10
01/11/16	1026	OCEAN	EN,VH 19,000	717	<10	10
01/11/16	1045	OCEAN	EN,VH 25,000	31	<10	<10
01/11/16	1110	OCEAN	EN,VH 35,000	86	<10	<10
01/11/16	1127	OCEAN	EN,VH 36,000	41	10	10
01/11/16	1131	OCEAN	EN,VH 37,000	41	<10	<10
01/11/16	1158	OCEAN	EN,VH 38,000	74	<10	<10
01/11/16	1150	OCEAN	EN,VH 39,000	98	<10	<10
01/11/16	1140	OCEAN	EN,VH 40,000	63	<10	<10
01/11/16	1224	OCEAN	EN,VH 41,000	63	10	<10
01/11/16	1228	OCEAN	EN,VH 42,000	63	41	10
01/11/16	1258	OCEAN	EN,VH 43,000	1,904	20	64
01/11/16	1245	OCEAN	EN,VH 44,000	41	<10	<10
01/11/16	1340	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Link

hotline: 1/12/16

website (advisory, data, close out 37000 in log): 1/12/16

email HD + AWA:

beachwatch (data + close out 37000 advisory):

RUN ON: 01/19/16

WATER QUALITY RESULTS
FROM COLL DATE: 01/19/16
THRU COLL DATE: 01/19/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
01/19/16	0831	OCEAN	EN,VH 1,000	31	<10	<10
01/19/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
01/19/16	0920	OCEAN	EN,VH 7,000	98	<10	10
01/19/16	0931	OCEAN	EN,VH 10,000	<10	<10	<10
01/19/16	0942	OCEAN	EN,VH 11,000	41	20	<10
01/19/16	1000	OCEAN	EN,VH 13,000	63	10	10
01/19/16	1009	OCEAN	EN,VH 14,000	75	10	10
01/19/16	1028	OCEAN	EN,VH 19,000	262	<10	<10
01/19/16	1044	OCEAN	EN,VH 25,000	110	10	<10
01/19/16	1108	OCEAN	EN,VH 35,000	41	10	<10
01/19/16	1120	OCEAN	EN,VH 36,000	187	63	10
01/19/16	1126	OCEAN	EN,VH 37,000	134	52	10
01/19/16	1138	OCEAN	EN,VH 38,000	52	10	<10
01/19/16	1150	OCEAN	EN,VH 39,000	1,354	<10	75
01/19/16	1156	OCEAN	EN,VH 40,000	<10	<10	20
<1001/19/16	1228	OCEAN	EN,VH 41,000	41	20	<10
01/19/16	1235	OCEAN	EN,VH 42,000	>24,196	98	137
01/19/16	****	OCEAN	EN,VH 43,000	NO	SAMPLE	COLLECTED
01/19/16	1251	OCEAN	EN,VH 44,000	20	<10	<10
01/19/16	1340	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Wahl

1/19/16 rain advisory

1/20/16 post 1 sign @ 42000

Beach Watch (advisory rain): open: 1/20/16

(advisory 42000): open: 1/20/16
(data): 1/20/16

email PWA + HD:

RUN ON: 01/25/16

WATER QUALITY RESULTS
FROM COLL DATE: 01/25/16
THRU COLL DATE: 01/25/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
01/25/16	0828	OCEAN	EN,VH 1,000	20	<10	<10
01/25/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
01/25/16	0903	OCEAN	EN,VH 7,000	63	10	<10
01/25/16	0913	OCEAN	EN,VH 10,000	52	10	10
01/25/16	0926	OCEAN	EN,VH 11,000	41	<10	<10
01/25/16	0945	OCEAN	EN,VH 13,000	243	<10	10
01/25/16	0955	OCEAN	EN,VH 14,000	213	10	<10
01/25/16	1006	OCEAN	EN,VH 19,000	<10	<10	<10
01/25/16	1030	OCEAN	EN,VH 25,000	41	<10	10
01/25/16	1050	OCEAN	EN,VH 35,000	10	<10	<10
01/25/16	1108	OCEAN	EN,VH 36,000	10	<10	<10
01/25/16	1112	OCEAN	EN,VH 37,000	20	<10	<10
01/25/16	1119	OCEAN	EN,VH 38,000	10	<10	10
01/25/16	1124	OCEAN	EN,VH 39,000	10	<10	<10
01/25/16	1130	OCEAN	EN,VH 40,000	20	<10	<10
01/25/16	1203	OCEAN	EN,VH 41,000	41	<10	<10
01/25/16	1207	OCEAN	EN,VH 42,000	10	10	<10
01/25/16	****	OCEAN	EN,VH 43,000	NO	SAMPLE	COLLECTED
01/25/16	1228	OCEAN	EN,VH 44,000	10	<10	<10
01/25/16	1320	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wahl						

Website: (advisory): 1/26/16
(data): 1/26/16

pull sign @ 42000: 1/26/16

hotline: 1/26/16

Beachwatch:

email HD+PWA:

RUN ON: 02/01/16

WATER QUALITY RESULTS
FROM COLL DATE: 02/01/16
THRU COLL DATE: 02/01/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
02/01/16	0836	OCEAN	EN,VH 1,000	884	31	53
02/01/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
02/01/16	0905	OCEAN	EN,VH 7,000	813	20	31
02/01/16	0920	OCEAN	EN,VH 10,000	1,354	41	87
02/01/16	0930	OCEAN	EN,VH 11,000	435	10	10
02/01/16	0943	OCEAN	EN,VH 13,000	19,863	82	384
02/01/16	0955	OCEAN	EN,VH 14,000	7,701	231	99
02/01/16	1010	OCEAN	EN,VH 19,000	3,448	145	111
02/01/16	1025	OCEAN	EN,VH 25,000	703	52	31
02/01/16	1055	OCEAN	EN,VH 35,000	350	<10	31
02/01/16	1100	OCEAN	EN,VH 36,000	836	299	64
02/01/16	1105	OCEAN	EN,VH 37,000	638	75	53
02/01/16	1115	OCEAN	EN,VH 38,000	288	10	10
02/01/16	1118	OCEAN	EN,VH 39,000	336	10	42
02/01/16	1124	OCEAN	EN,VH 40,000	160	10	10
02/01/16	1145	OCEAN	EN,VH 41,000	86	<10	20
02/01/16	1154	OCEAN	EN,VH 42,000	158	10	10
02/01/16	1200	OCEAN	EN,VH 43,000	185	<10	10
02/01/16	1212	OCEAN	EN,VH 44,000	161	<10	<10
02/01/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Otten/Wahle						

posted: 2/2/16 (2 signs @ 13,000, 1 sign @ 19,000)

★ rain advisory from 2/1/16 in effect so hotline + website
(advisory) will be changed after end of advisory.

hotline (rain): 2/1/16, website (log + advisory - rain): 2/1/16

website (data): 2/2/16

website (log): 2/2/16

email HD + PWA: 2/2/16

press release (rain): 2/1/16

RUN ON: 02/09/16

WATER QUALITY RESULTS
FROM COLL DATE: 02/09/16
THRU COLL DATE: 02/09/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
02/09/16	0824	OCEAN	EN,VH 1,000	10	<10	<10
02/09/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
02/09/16	0858	OCEAN	EN,VH 7,000	<10	<10	10
02/09/16	0906	OCEAN	EN,VH 10,000	41	10	<10
02/09/16	0914	OCEAN	EN,VH 11,000	10	<10	<10
02/09/16	0930	OCEAN	EN,VH 13,000	10	10	10
02/09/16	0940	OCEAN	EN,VH 14,000	173	<10	10
02/09/16	0953	OCEAN	EN,VH 19,000	10	<10	<10
02/09/16	1015	OCEAN	EN,VH 25,000	20	<10	<10
02/09/16	1033	OCEAN	EN,VH 35,000	63	<10	10
02/09/16	1048	OCEAN	EN,VH 36,000	63	<10	99
02/09/16	1053	OCEAN	EN,VH 37,000	<10	<10	10
02/09/16	1100	OCEAN	EN,VH 38,000	148	<10	87
02/09/16	1105	OCEAN	EN,VH 39,000	<10	<10	<10
02/09/16	1113	OCEAN	EN,VH 40,000	<10	<10	<10
02/09/16	1144	OCEAN	EN,VH 41,000	20	20	<10
02/09/16	1148	OCEAN	EN,VH 42,000	20	10	<10
02/09/16	1153	OCEAN	EN,VH 43,000	<10	<10	<10
02/09/16	1206	OCEAN	EN,VH 44,000	<10	<10	<10
02/09/16	1345	OCEAN	LAB BLANK	<10	<10	<10
Sampled by WBL						

★ Contribute down, could not update website on 2/10/16.

hotline: 2/10/16

email HD + PWA:

website:

Beach Watch:

RUN ON: 02/16/16

WATER QUALITY RESULTS
FROM COLL DATE: 02/16/16
THRU COLL DATE: 02/16/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
02/16/16	0832	OCEAN	EN,VH 1,000	41	<10	<10
02/16/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
02/16/16	0907	OCEAN	EN,VH 7,000	75	<10	<10
02/16/16	0918	OCEAN	EN,VH 10,000	20	10	<10
02/16/16	0930	OCEAN	EN,VH 11,000	<10	<10	<10
02/16/16	0943	OCEAN	EN,VH 13,000	<10	<10	<10
02/16/16	0958	OCEAN	EN,VH 14,000	10	<10	<10
02/16/16	1016	OCEAN	EN,VH 19,000	<10	<10	<10
02/16/16	1032	OCEAN	EN,VH 25,000	10	<10	<10
02/16/16	1100	OCEAN	EN,VH 35,000	20	<10	20
02/16/16	1113	OCEAN	EN,VH 36,000	31	<10	<10
02/16/16	1120	OCEAN	EN,VH 37,000	10	<10	<10
02/16/16	1126	OCEAN	EN,VH 38,000	63	<10	10
02/16/16	1132	OCEAN	EN,VH 39,000	<10	<10	<10
02/16/16	1138	OCEAN	EN,VH 40,000	52	10	<10
02/16/16	1214	OCEAN	EN,VH 41,000	<10	<10	<10
02/16/16	1220	OCEAN	EN,VH 42,000	<10	<10	<10
02/16/16	1224	OCEAN	EN,VH 43,000	<10	<10	<10
02/16/16	1238	OCEAN	EN,VH 44,000	<10	<10	<10
02/16/16	1330	OCEAN	LAB BLANK	<10	<10	<10
Sampled Tuesday by W&L						
* Mon. 2/15 holiday						

website (data + rain advisory): 2/17/16
(log - rain advisory): 2/18/16

hotline: 2/17/16 (rainfall advisory): 2/17
press release (rainfall advisory): 2/17

email HD + PWA:

Beachwatch (data + ^{rain} advisory):

RUN ON: 02/22/16

WATER QUALITY RESULTS
FROM COLL DATE: 02/22/16
THRU COLL DATE: 02/22/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
02/22/16	0830	OCEAN	EN,VH 1,000	20	<10	<10
02/22/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
02/22/16	0900	OCEAN	EN,VH 7,000	<10	<10	<10
02/22/16	0905	OCEAN	EN,VH 10,000	97	<10	31
02/22/16	0914	OCEAN	EN,VH 11,000	31	<10	10
02/22/16	0933	OCEAN	EN,VH 13,000	10	<10	<10
02/22/16	0940	OCEAN	EN,VH 14,000	301	<10	<10
02/22/16	0950	OCEAN	EN,VH 19,000	10	<10	<10
02/22/16	1005	OCEAN	EN,VH 25,000	31	10	<10
02/22/16	1028	OCEAN	EN,VH 35,000	41	<10	<10
02/22/16	1041	OCEAN	EN,VH 36,000	86	10	20
02/22/16	1045	OCEAN	EN,VH 37,000	20	10	<10
02/22/16	1048	OCEAN	EN,VH 38,000	30	<10	<10
02/22/16	1056	OCEAN	EN,VH 39,000	10	<10	<10
02/22/16	1103	OCEAN	EN,VH 40,000	10	<10	<10
02/22/16	1137	OCEAN	EN,VH 41,000	41	10	<10
02/22/16	1148	OCEAN	EN,VH 42,000	31	20	<10
02/22/16	1154	OCEAN	EN,VH 43,000	41	20	<10
02/22/16	1210	OCEAN	EN,VH 44,000	<10	<10	10
02/22/16	1320	OCEAN	LAB BLANK	<10	<10	<10

Sampled by W. Able

hotline: updated 2/22/16 (remove rain advisory)

website (advisory): updated 2/22/16 (remove rain advisory)
(data): 2/23/16

email LTD + PWA: 2/23/16

BeachWatch: 2/23/16

RUN ON: 03/01/16

WATER QUALITY RESULTS
FROM COLL DATE: 03/01/16
THRU COLL DATE: 03/01/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
03/01/16	0830	OCEAN	EN,VH 1,000	52	31	<10
03/01/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
03/01/16	0917	OCEAN	EN,VH 7,000	20	10	<10
03/01/16	0928	OCEAN	EN,VH 10,000	<10	<10	<10
03/01/16	0940	OCEAN	EN,VH 11,000	<10	<10	<10
03/01/16	0952	OCEAN	EN,VH 13,000	<10	<10	<10
03/01/16	1004	OCEAN	EN,VH 14,000	<10	<10	<10
03/01/16	1020	OCEAN	EN,VH 19,000	10	10	<10
03/01/16	1036	OCEAN	EN,VH 25,000	10	<10	<10
03/01/16	1110	OCEAN	EN,VH 35,000	10	<10	<10
03/01/16	1121	OCEAN	EN,VH 36,000	31	10	<10
03/01/16	1128	OCEAN	EN,VH 37,000	31	10	<10
03/01/16	1132	OCEAN	EN,VH 38,000	10	<10	<10
03/01/16	1138	OCEAN	EN,VH 39,000	30	<10	<10
03/01/16	1145	OCEAN	EN,VH 40,000	10	<10	<10
03/01/16	1225	OCEAN	EN,VH 41,000	<10	<10	<10
03/01/16	1230	OCEAN	EN,VH 42,000	<10	<10	<10
03/01/16	1236	OCEAN	EN,VH 43,000	<10	<10	<10
03/01/16	1250	OCEAN	EN,VH 44,000	<10	<10	<10
03/01/16	1300	OCEAN	LAB BLANK	<10	<10	<10

Sampled by WHL

Down off on march 2/24, so sampled 3/1/16

Hotline: 3/2/16

Website (data & advisory): 3/3 (get ¹¹¹¹ results too late)

email HQ + RWA 3/3/16

Beachwatch (data): 3/3/16

RUN ON: 03/07/16

WATER QUALITY RESULTS
FROM COLL DATE: 03/07/16
THRU COLL DATE: 03/07/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
03/07/16	0845	OCEAN	EN,VH 1,000	>24,196	1,860	>2,005
03/07/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
03/07/16	0930	OCEAN	EN,VH 7,000	>24,196	860	1,445
03/07/16	0940	OCEAN	EN,VH 10,000	3,255	31	124
03/07/16	0950	OCEAN	EN,VH 11,000	1,565	41	42
03/07/16	1008	OCEAN	EN,VH 13,000	>24,196	3,300	>2,005
03/07/16	1015	OCEAN	EN,VH 14,000	>24,196	1,137	1,184
03/07/16	1030	OCEAN	EN,VH 19,000	>24,196	1,918	>2,005
03/07/16	1048	OCEAN	EN,VH 25,000	3,654	85	137
03/07/16	1115	OCEAN	EN,VH 35,000	52	10	10
03/07/16	1123	OCEAN	EN,VH 36,000	10,462	134	453
03/07/16	1127	OCEAN	EN,VH 37,000	6,488	331	1,184
03/07/16	1133	OCEAN	EN,VH 38,000	199	31	<10
03/07/16	1140	OCEAN	EN,VH 39,000	529	10	31
03/07/16	1146	OCEAN	EN,VH 40,000	816	20	31
03/07/16	1214	OCEAN	EN,VH 41,000	108	<10	31
03/07/16	1220	OCEAN	EN,VH 42,000	>24,196	1,670	>2,005
03/07/16	****	OCEAN	EN,VH 43,000	NO	SAMPLE	COLLECTED
03/07/16	1240	OCEAN	EN,VH 44,000	>24,196	121	222
03/07/16	1330	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wabl						

Postings: 3/8/16 see attached

website (data): 3/8/16

website (advisory): 3/8/16

website (log): 3/9/16 (open), (close)

hotline: 3/8/16

email HD + PWA:

Beachwatch (data): 3/9/16

Beachwatch (rain advisory): 3/9/16 (open), (close)

Beachwatch (beach advisory): 3/9/16 (open), (close)

press release (rain): 3/7/16

RUN ON: 03/14/16

WATER QUALITY RESULTS
FROM COLL DATE: 03/14/16
THRU COLL DATE: 03/14/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
03/14/16	0836	OCEAN	EN,VH 1,000	98	<10	10
03/14/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
03/14/16	0922	OCEAN	EN,VH 7,000	30	<10	<10
03/14/16	0935	OCEAN	EN,VH 10,000	41	<10	<10
03/14/16	0946	OCEAN	EN,VH 11,000	52	<10	<10
03/14/16	1006	OCEAN	EN,VH 13,000	185	20	<10
03/14/16	1024	OCEAN	EN,VH 14,000	171	10	<10
03/14/16	1042	OCEAN	EN,VH 19,000	187	10	99
03/14/16	1102	OCEAN	EN,VH 25,000	85	10	<10
03/14/16	1130	OCEAN	EN,VH 35,000	85	10	<10
03/14/16	1140	OCEAN	EN,VH 36,000	259	<10	64
03/14/16	1145	OCEAN	EN,VH 37,000	31	10	64
03/14/16	1148	OCEAN	EN,VH 38,000	31	10	<10
03/14/16	1154	OCEAN	EN,VH 39,000	327	<10	<10
03/14/16	1200	OCEAN	EN,VH 40,000	52	<10	<10
03/14/16	1232	OCEAN	EN,VH 41,000	20	<10	<10
03/14/16	1240	OCEAN	EN,VH 42,000	10	<10	<10
03/14/16	****	OCEAN	EN,VH 43,000	NO	SAMPLE	COLLECTED
03/14/16	1258	OCEAN	EN,VH 44,000	2,359	<10	<10
03/14/16	1320	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wahl						

website (data + advisory) : 3/15/16

hotline : 3/15/16

email HTS & RST :

Beachwatcher:(data) : 3/16/16

RUN ON: 03/21/16

WATER QUALITY RESULTS
FROM COLL DATE: 03/21/16
THRU COLL DATE: 03/21/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
03/21/16	0825	OCEAN	EN,VH 1,000	10	10	<10
03/21/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
03/21/16	0930	OCEAN	EN,VH 7,000	20	<10	<10
03/21/16	0919	OCEAN	EN,VH 10,000	<10	<10	<10
03/21/16	0906	OCEAN	EN,VH 11,000	63	10	<10
03/21/16	0947	OCEAN	EN,VH 13,000	62	<10	<10
03/21/16	0956	OCEAN	EN,VH 14,000	199	10	<10
03/21/16	1008	OCEAN	EN,VH 19,000	31	<10	<10
03/21/16	****	OCEAN	EN,VH 25,000	NO	SAMPLE	COLLECTED
03/21/16	1038	OCEAN	EN,VH 35,000	<10	<10	20
03/21/16	1052	OCEAN	EN,VH 36,000	75	31	10
03/21/16	1101	OCEAN	EN,VH 37,000	156	<10	20
03/21/16	1105	OCEAN	EN,VH 38,000	<10	<10	<10
03/21/16	1110	OCEAN	EN,VH 39,000	20	<10	<10
03/21/16	1116	OCEAN	EN,VH 40,000	10	<10	<10
03/21/16	1152	OCEAN	EN,VH 41,000	20	<10	<10
03/21/16	1201	OCEAN	EN,VH 42,000	41	20	<10
03/21/16	1227	OCEAN	EN,VH 43,000	10	10	<10
03/21/16	1215	OCEAN	EN,VH 44,000	<10	<10	<10
03/21/16	1300	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Wahl / Guerrero

Website: 3/22/16

Hotline: 3/22/16

Email HD + PWA: 3/22/16

Beachwatch:

RUN ON: 03/28/16

WATER QUALITY RESULTS
FROM COLL DATE: 03/28/16
THRU COLL DATE: 03/28/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
03/28/16	0845	OCEAN	EN,VH 1,000	10	<10	<10
03/28/16	****	OCEAN	EN,VH 4,000	NO	SAMPLE	COLLECTED
03/28/16	0908	OCEAN	EN,VH 7,000	<10	<10	<10
03/28/16	0921	OCEAN	EN,VH 10,000	10	10	<10
03/28/16	0930	OCEAN	EN,VH 11,000	10	<10	<10
03/28/16	0943	OCEAN	EN,VH 13,000	41	<10	<10
03/28/16	0953	OCEAN	EN,VH 14,000	10	<10	<10
03/28/16	1003	OCEAN	EN,VH 19,000	52	20	<10
03/28/16	1015	OCEAN	EN,VH 25,000	5,172	<10	<10
03/28/16	1041	OCEAN	EN,VH 35,000	2,481	<10	<10
03/28/16	1100	OCEAN	EN,VH 36,000	2,613	2,014	<10
03/28/16	1102	OCEAN	EN,VH 37,000	134	<10	31
03/28/16	1106	OCEAN	EN,VH 38,000	880	<10	<10
03/28/16	1111	OCEAN	EN,VH 39,000	816	<10	<10
03/28/16	1148	OCEAN	EN,VH 40,000	388	<10	<10
03/28/16	1217	OCEAN	EN,VH 41,000	160	63	<10
03/28/16	1223	OCEAN	EN,VH 42,000	62	30	<10
03/28/16	1227	OCEAN	EN,VH 43,000	<10	<10	<10
03/28/16	1247	OCEAN	EN,VH 44,000	31	<10	<10
03/28/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by: [Signature]						

Website; (advisory): 3/29/16
(data): 3/29/16

Hotline: 3/28/16

Email HD + PWA:

Beachwatch (data):
(advisory):

posted 36000/Hobie: 3/29/16 - one post at boat launch

RUN ON: 04/05/16

**WATER QUALITY RESULTS
FROM COLL DATE: 04/05/16
THRU COLL DATE: 04/05/16
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
04/05/16	0812	OCEAN	EN,VH 29,000	703	<10	<10
04/05/16	0820	OCEAN	EN,VH 30,000	448	<10	42
04/05/16	0835	OCEAN	EN,VH 32,000	173	20	<10
04/05/16	0841	OCEAN	EN,VH 33,000	158	<10	<10
04/05/16	0855	OCEAN	EN,VH 34,000	173	<10	<10
04/05/16	0904	OCEAN	EN,VH 35,000	131	10	<10
04/05/16	0915	OCEAN	EN,VH 36,000	20	<10	20
04/05/16	0918	OCEAN	EN,VH 37,000	98	41	<10
04/05/16	0924	OCEAN	EN,VH 38,000	30	<10	<10
04/05/16	0931	OCEAN	EN,VH 39,000	41	<10	<10
04/05/16	0938	OCEAN	EN,VH 40,000	41	<10	<10
04/05/16	1001	OCEAN	EN,VH 41,000	10	<10	<10
04/05/16	1015	OCEAN	EN,VH 42,000	<10	<10	<10
04/05/16	1023	OCEAN	EN,VH 43,000	<10	<10	<10
04/05/16	1049	OCEAN	EN,VH 44,000	10	<10	<10
04/05/16	1112	OCEAN	EN,VH 45,000	<10	<10	<10
04/05/16	1122	OCEAN	EN,VH 46,000	<10	<10	<10
04/05/16	1132	OCEAN	EN,VH 47,000	<10	<10	<10
04/05/16	1143	OCEAN	EN,VH 49,500	<10	<10	<10
04/05/16	1152	OCEAN	EN,VH 50,000	<10	<10	<10
04/05/16	1320	OCEAN	LAB BLANK	<10	<10	<10
Sampled by: Welch / Torrisian						
Website (advisory + data): 4/6/16						
email HD + PWA: 4/6/16						
Beachwatch:						
hotline: 4/6/16						
pull Hobie/36000 advisory: 4/6/16 + close advisory in Beachwatch						

RUN ON: 04/12/16

**WATER QUALITY RESULTS
FROM COLL DATE: 04/12/16
THRU COLL DATE: 04/12/16
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 04/19/16

**WATER QUALITY RESULTS
FROM COLL DATE: 04/19/16
THRU COLL DATE: 04/19/16
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
04/19/16	1220	OCEAN	EN,VH 29,000	<10	<10	<10
04/19/16	1212	OCEAN	EN,VH 30,000	<10	<10	<10
04/19/16	1200	OCEAN	EN,VH 32,000	<10	<10	<10
04/19/16	1152	OCEAN	EN,VH 33,000	10	10	10
04/19/16	1140	OCEAN	EN,VH 34,000	<10	<10	<10
04/19/16	1136	OCEAN	EN,VH 35,000	20	10	<10
04/19/16	1121	OCEAN	EN,VH 36,000	20	<10	<10
04/19/16	1118	OCEAN	EN,VH 37,000	52	<10	10
04/19/16	1109	OCEAN	EN,VH 38,000	<10	<10	<10
04/19/16	1103	OCEAN	EN,VH 39,000	10	<10	<10
04/19/16	1058	OCEAN	EN,VH 40,000	20	<10	<10
04/19/16	1036	OCEAN	EN,VH 41,000	63	52	<10
04/19/16	1032	OCEAN	EN,VH 42,000	<10	<10	<10
04/19/16	1025	OCEAN	EN,VH 43,000	31	<10	<10
04/19/16	0958	OCEAN	EN,VH 44,000	20	<10	<10
04/19/16	0936	OCEAN	EN,VH 45,000	20	<10	<10
04/19/16	0926	OCEAN	EN,VH 46,000	<10	<10	<10
04/19/16	0918	OCEAN	EN,VH 47,000	<10	<10	<10
04/19/16	0910	OCEAN	EN,VH 49,500	<10	<10	<10
04/19/16	0900	OCEAN	EN,VH 50,000	10	<10	<10
04/19/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wahl						
Update website (data + advisory): 4/20/15						
Hotline: 4/20						
email HPD+PWA:						
Beach status (date):						

RUN ON: 04/26/16

**WATER QUALITY RESULTS
FROM COLL DATE: 04/26/16
THRU COLL DATE: 04/26/16
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 05/03/16

**WATER QUALITY RESULTS
FROM COLL DATE: 05/03/16
THRU COLL DATE: 05/03/16
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
05/03/16	0825	OCEAN	EN,VH 29,000	31	10	<10
05/03/16	0835	OCEAN	EN,VH 30,000	10	<10	<10
05/03/16	0847	OCEAN	EN,VH 32,000	<10	<10	<10
05/03/16	0851	OCEAN	EN,VH 33,000	10	<10	<10
05/03/16	0900	OCEAN	EN,VH 34,000	<10	<10	<10
05/03/16	0903	OCEAN	EN,VH 35,000	<10	<10	<10
05/03/16	0920	OCEAN	EN,VH 36,000	20	10	<10
05/03/16	0923	OCEAN	EN,VH 37,000	31	<10	10
05/03/16	0928	OCEAN	EN,VH 38,000	<10	<10	<10
05/03/16	0933	OCEAN	EN,VH 39,000	<10	<10	<10
05/03/16	0937	OCEAN	EN,VH 40,000	10	<10	<10
05/03/16	1006	OCEAN	EN,VH 41,000	<10	<10	<10
05/03/16	1019	OCEAN	EN,VH 42,000	<10	<10	<10
05/03/16	1024	OCEAN	EN,VH 43,000	<10	<10	<10
05/03/16	1050	OCEAN	EN,VH 44,000	<10	<10	<10
05/03/16	1114	OCEAN	EN,VH 45,000	<10	<10	<10
05/03/16	1125	OCEAN	EN,VH 46,000	<10	<10	<10
05/03/16	1130	OCEAN	EN,VH 47,000	<10	<10	<10
05/03/16	1142	OCEAN	EN,VH 49,500	<10	<10	<10
05/03/16	1150	OCEAN	EN,VH 50,000	<10	<10	<10
05/03/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wade Otten						
Website: 5/4/16						
hotline: 5/4/16						
email HD + PWA: 5/4/16						
Beachwatch:						

RUN ON: 05/10/16

WATER QUALITY RESULTS
FROM COLL DATE: 05/10/16
THRU COLL DATE: 05/10/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
05/10/16	0900	OCEAN	EN,VH 29,000	10	10	<10
05/10/16	0903	OCEAN	EN,VH 30,000	<10	<10	<10
05/10/16	0915	OCEAN	EN,VH 32,000	10	<10	<10
05/10/16	0920	OCEAN	EN,VH 33,000	<10	<10	<10
05/10/16	0927	OCEAN	EN,VH 34,000	<10	<10	<10
05/10/16	0934	OCEAN	EN,VH 35,000	10	<10	<10
05/10/16	0950	OCEAN	EN,VH 36,000	63	10	64
05/10/16	0955	OCEAN	EN,VH 37,000	52	20	10
05/10/16	1000	OCEAN	EN,VH 38,000	41	<10	<10
05/10/16	1006	OCEAN	EN,VH 39,000	<10	<10	<10
05/10/16	1012	OCEAN	EN,VH 40,000	<10	<10	<10
05/10/16	1035	OCEAN	EN,VH 41,000	<10	<10	<10
05/10/16	1041	OCEAN	EN,VH 42,000	10	<10	<10
05/10/16	1047	OCEAN	EN,VH 43,000	10	<10	10
05/10/16	1118	OCEAN	EN,VH 44,000	<10	<10	<10
05/10/16	1152	OCEAN	EN,VH 45,000	<10	<10	<10
05/10/16	1202	OCEAN	EN,VH 46,000	<10	<10	<10
05/10/16	1208	OCEAN	EN,VH 47,000	<10	<10	<10
05/10/16	1217	OCEAN	EN,VH 49,500	<10	<10	<10
05/10/16	1230	OCEAN	EN,VH 50,000	<10	<10	<10
05/10/16	1300	OCEAN	LAB BLANK	<10	<10	<10
	Sampled by Lustig/Wahle					
Website: no access, done by allen Brown 5/11/16						
hotline: 5/11/16						
email HD + PWA: 5/13/16						
Beach Watch: 5/13/16						

RUN ON: 05/17/16

WATER QUALITY RESULTS
FROM COLL DATE: 05/17/16
THRU COLL DATE: 05/17/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
05/17/16	1055	OCEAN	EN,VH 29,000	12,997	<10	<10
05/17/16	1105	OCEAN	EN,VH 30,000	5,172	<10	<10
05/17/16	1112	OCEAN	EN,VH 32,000	355	<10	<10
05/17/16	1128	OCEAN	EN,VH 33,000	520	<10	<10
05/17/16	1135	OCEAN	EN,VH 34,000	175	<10	<10
05/17/16	1142	OCEAN	EN,VH 35,000	233	<10	<10
05/17/16	1008	OCEAN	EN,VH 36,000	52	10	<10
05/17/16	1012	OCEAN	EN,VH 37,000	31	10	10
05/17/16	1019	OCEAN	EN,VH 38,000	121	<10	<10
05/17/16	1026	OCEAN	EN,VH 39,000	20	<10	<10
05/17/16	1035	OCEAN	EN,VH 40,000	10	<10	<10
05/17/16	0928	OCEAN	EN,VH 41,000	<10	<10	<10
05/17/16	0942	OCEAN	EN,VH 42,000	20	<10	<10
05/17/16	0947	OCEAN	EN,VH 43,000	<10	<10	<10
05/17/16	0910	OCEAN	EN,VH 44,000	10	<10	<10
05/17/16	0758	OCEAN	EN,VH 45,000	<10	<10	<10
05/17/16	0809	OCEAN	EN,VH 46,000	20	<10	<10
05/17/16	0817	OCEAN	EN,VH 47,000	10	<10	<10
05/17/16	0825	OCEAN	EN,VH 49,500	10	10	<10
05/17/16	0830	OCEAN	EN,VH 50,000	10	10	<10
05/17/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Otten						
Resample + post 29000: 5/18/16						
Website (data, advisory, log): 5/18/16						
email HD + PWA:						
Hotline: 5/18/16 pm						
Beachwatch (data + advisory): 5/23/16						

**WATER QUALITY RESULTS
FROM COLL DATE: 05/24/16
THRU COLL DATE: 05/24/16
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 05/31/16

WATER QUALITY RESULTS
FROM COLL DATE: 05/31/16
THRU COLL DATE: 05/31/16
LOCATION: ENVH, ENVH

[illegible]

WATER QUALITY RESULTS
FROM COLL DATE: 06/07/16
THRU COLL DATE: 06/07/16
LOCATION: ENVH, ENVH

6/9/11

Sample @ 12:08 should be 47000, not 46000.

WATER QUALITY RESULTS
FROM COLL DATE: 06/14/16
THRU COLL DATE: 06/14/16
LOCATION: ENVH, ENVH

Sampled by Wade/Benchimol
Hotline + website: 6/15/16
email HD + PWA: 6/15/16
Beach watch: 6/15/16

RUN ON: 06/20/16

**WATER QUALITY RESULTS
FROM COLL DATE: 06/20/16
THRU COLL DATE: 06/20/16
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 06/28/16

**WATER QUALITY RESULTS
FROM COLL DATE: 06/28/16
THRU COLL DATE: 06/28/16
LOCATION: ENVH, ENVH**

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
06/28/16	1232	OCEAN	EN,VH 29,000 ✓	231	<10	<10
06/28/16	1223	OCEAN	EN,VH 30,000 ✓	31	<10	10
06/28/16	1212	OCEAN	EN,VH 32,000 ✓	10	<10	<10
06/28/16	1207	OCEAN	EN,VH 33,000 ✓	20	<10	10
06/28/16	1200	OCEAN	EN,VH 34,000 ✓	10	<10	<10
06/28/16	1151	OCEAN	EN,VH 35,000 ✓	<10	<10	<10
06/28/16	1100	OCEAN	EN,VH 36,000 ✓	10	<10\	<10
06/28/16	1106	OCEAN	EN,VH 37,000 ✓	41	20	20
06/28/16	1111	OCEAN	EN,VH 38,000 ✓	<10	<10	<10
06/28/16	1121	OCEAN	EN,VH 39,000 ✓	10	<10	<10
06/28/16	1128	OCEAN	EN,VH 40,000 ✓	10	<10	<10
06/28/16	1045	OCEAN	EN,VH 41,000 ✓	249	98	<10
06/28/16	1038	OCEAN	EN,VH 42,000 ✓	31	10	<10
06/28/16	1030	OCEAN	EN,VH 43,000 ✓	<10	<10	<10
06/28/16	1003	OCEAN	EN,VH 44,000 ✓	<10	<10	<10
06/28/16	0845	OCEAN	EN,VH 45,000 ✓	<10	<10	<10
06/28/16	0855	OCEAN	EN,VH 46,000 ✓	10	10	<10
06/28/16	0903	OCEAN	EN,VH 47,000 ✓	<10	<10	<10
06/28/16	0915	OCEAN	EN,VH 49,500 ✓	<10	<10	<10
06/28/16	0922	OCEAN	EN,VH 50,000 ✓	<10	<10	<10
06/28/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Updated Website (results + advisory): 6/29/16						
Beachwatch: 6/29/16						
Email HD + PWA:						
Hotline: 6/29/16						

RUN ON: 07/05/16

WATER QUALITY RESULTS
FROM COLL DATE: 07/05/16
THRU COLL DATE: 07/05/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 ml
07/05/16	0845	OCEAN	EN,VH 1,000	10	<10	<10
07/05/16	0912	OCEAN	EN,VH 4,000	10	<10	<10
07/05/16	0922	OCEAN	EN,VH 7,000	<10	<10	<10
07/05/16	0942	OCEAN	EN,VH 10,000	383	121	10
07/05/16	1000	OCEAN	EN,VH 11,000	10	<10	<10
07/05/16	1010	OCEAN	EN,VH 13,000	287	20	64
07/05/16	1018	OCEAN	EN,VH 14,000	63	10	<10
07/05/16	1035	OCEAN	EN,VH 19,000	<10	<10	20
07/05/16	1054	OCEAN	EN,VH 25,000	20	10	<10
07/05/16	1120	OCEAN	EN,VH 35,000	20	10	<10
07/05/16	1132	OCEAN	EN,VH 36,000	10	<10	<10
07/05/16	1135	OCEAN	EN,VH 37,000	201	41	<10
07/05/16	1153	OCEAN	EN,VH 38,000	31	10	<10
07/05/16	1200	OCEAN	EN,VH 39,000	10	<10	<10
07/05/16	1205	OCEAN	EN,VH 40,000	<10	<10	<10
07/05/16	1230	OCEAN	EN,VH 41,000	10	<10	<10
07/05/16	1235	OCEAN	EN,VH 42,000	<10	<10	<10
07/05/16	1240	OCEAN	EN,VH 43,000	<10	<10	<10
07/05/16	1258	OCEAN	EN,VH 44,000	<10	<10	<10
07/05/16	1330	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Wahl - Holiday Schedule

Website: 7/6/16

Beachwatch: 7/6/16

Hotline: 7/6/16

Email HD + PWA:

RUN ON: 07/12/16

WATER QUALITY RESULTS
FROM COLL DATE: 07/12/16
THRU COLL DATE: 07/12/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
07/12/16	1232	OCEAN	EN,VH 29,000	<10	<10	<10
07/12/16	1220	OCEAN	EN,VH 30,000	<10	<10	<10
07/12/16	1210	OCEAN	EN,VH 32,000	<10	<10	<10
07/12/16	1205	OCEAN	EN,VH 33,000	52	31	<10
07/12/16	1158	OCEAN	EN,VH 34,000	<10	<10	<10
07/12/16	1152	OCEAN	EN,VH 35,000	134	<10	<10
07/12/16	1115	OCEAN	EN,VH 36,000	41	<10	<10
07/12/16	1120	OCEAN	EN,VH 37,000	10	10	10
07/12/16	1125	OCEAN	EN,VH 38,000	10	<10	<10
07/12/16	1132	OCEAN	EN,VH 39,000	20	10	<10
07/12/16	1138	OCEAN	EN,VH 40,000	<10	<10	<10
07/12/16	1140	OCEAN	EN,VH 41,000	<10	<10	<10
07/12/16	1046	OCEAN	EN,VH 42,000	<10	<10	<10
07/12/16	1055	OCEAN	EN,VH 43,000	98	98	<10
07/12/16	1010	OCEAN	EN,VH 44,000	<10	<10	<10
07/12/16	0850	OCEAN	EN,VH 45,000	<10	<10	<10
07/12/16	0900	OCEAN	EN,VH 46,000	<10	<10	<10
07/12/16	0909	OCEAN	EN,VH 47,000	<10	<10	<10
07/12/16	0917	OCEAN	EN,VH 49,500	20	<10	<10
07/12/16	0927	OCEAN	EN,VH 50,000	10	<10	<10
07/12/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wahl						
Website (data + advisory): 7/13/16						
email PWA + HD: 7/13/16						
Hotline:						

Beachwatch: 7/13/16

RUN ON: 07/19/16

WATER QUALITY RESULTS
FROM COLL DATE: 07/19/16
THRU COLL DATE: 07/19/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
07/19/16	1230	OCEAN	EN,VH 29,000	10	<10	10
07/19/16	1214	OCEAN	EN,VH 30,000	<10	<10	10
07/19/16	1205	OCEAN	EN,VH 32,000	<10	<10	<10
07/19/16	1201	OCEAN	EN,VH 33,000	20	10	10
07/19/16	1152	OCEAN	EN,VH 34,000	<10	<10	<10
07/19/16	1142	OCEAN	EN,VH 35,000	<10	<10	10
07/19/16	1103	OCEAN	EN,VH 36,000	10	<10	10
07/19/16	1107	OCEAN	EN,VH 37,000	52	10	<10
07/19/16	1212	OCEAN	EN,VH 38,000	<10	<10	<10
07/19/16	1119	OCEAN	EN,VH 39,000	<10	<10	<10
07/19/16	1124	OCEAN	EN,VH 40,000	<10	<10	<10
07/19/16	1024	OCEAN	EN,VH 41,000	10	<10	<10
07/19/16	1030	OCEAN	EN,VH 42,000	51	20	<10
07/19/16	1036	OCEAN	EN,VH 43,000	20	<10	<10
07/19/16	1006	OCEAN	EN,VH 44,000	<10	<10	<10
07/19/16	0845	OCEAN	EN,VH 45,000	96	10	<10
07/19/16	0856	OCEAN	EN,VH 46,000	10	<10	<10
07/19/16	0905	OCEAN	EN,VH 47,000	63	<10	<10
07/19/16	0910	OCEAN	EN,VH 49,500	31	<10	<10
07/19/16	0922	OCEAN	EN,VH 50,000	10	<10	<10
07/19/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wabbe						
Wabbe						
Wabbe 7/20/16						
Wabbe 7/20/16						
Wabbe 7/20/16						
Email PD + SEA 7/20/16						

**WATER QUALITY RESULTS
FROM COLL DATE: 07/26/16
THRU COLL DATE: 07/26/16
LOCATION: ENVH, ENVH**

[illegible]

WATER QUALITY RESULTS
FROM COLL DATE: 08/03/16
THRU COLL DATE: 08/03/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
8/2						
08/03/16	1238	OCEAN	EN,VH 29,000	<10	<10	<10
08/03/16	1228	OCEAN	EN,VH 30,000	20	<10	<10
08/03/16	1216	OCEAN	EN,VH 32,000	52	30	<10
08/03/16	1212	OCEAN	EN,VH 33,000	10	10	<10
08/03/16	1205	OCEAN	EN,VH 34,000	10	10	<10
08/03/16	1158	OCEAN	EN,VH 35,000	<10	<10	<10
08/03/16	1116	OCEAN	EN,VH 36,000	74	10	<10
08/03/16	1120	OCEAN	EN,VH 37,000	189	63	10
08/03/16	1125	OCEAN	EN,VH 38,000	30	10	10
08/03/16	1133	OCEAN	EN,VH 39,000	<10	<10	<10
08/03/16	1143	OCEAN	EN,VH 40,000	10	10	<10
08/03/16	1040	OCEAN	EN,VH 41,000	20	10	<10
08/03/16	1045	OCEAN	EN,VH 42,000	<10	<10	<10
08/03/16	1051	OCEAN	EN,VH 43,000	<10	<10	<10
08/03/16	1015	OCEAN	EN,VH 44,000	<10	<10	<10
08/03/16	0850	OCEAN	EN,VH 45,000	63	10	<10
08/03/16	0858	OCEAN	EN,VH 46,000	31	<10	<10
08/03/16	0906	OCEAN	EN,VH 47,000	10	<10	<10
08/03/16	0930	OCEAN	EN,VH 49,500	189	<10	<10
08/03/16	0920	OCEAN	EN,VH 50,000	52	10	<10
08/03/16	1315	OCEAN	LAB BLANK	<10	<10	<10
Sampled by:	Wahl					
Website:	8/3					
Hotline:	8/3					
Email:	HQ + AIA: 8/10/16					
Brockington:	8/10/16					

Remove ports: 8/3/14

place posts: 8/2/14 (2)

RUN ON: 08/09/16

**WATER QUALITY RESULTS
FROM COLL DATE: 08/09/16
THRU COLL DATE: 08/09/16
LOCATION: ENVH, ENVH**

[illegible]

RUN ON: 08/16/16

WATER QUALITY RESULTS
FROM COLL DATE: 08/16/16
THRU COLL DATE: 08/16/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
08/16/16	1220	OCEAN	EN,VH 29,000	>24,196	10	<10
08/16/16	1212	OCEAN	EN,VH 30,000	>24,196	<10	<10
08/16/16	1204	OCEAN	EN,VH 32,000	>24,196	20	<10
08/16/16	1200	OCEAN	EN,VH 33,000	>24,196	<10	<10
08/16/16	1147	OCEAN	EN,VH 34,000	>24,196	20	<10
08/16/16	1142	OCEAN	EN,VH 35,000	>24,196	<10	<10
08/16/16	1103	OCEAN	EN,VH 36,000	1,039	<10	<10
08/16/16	1107	OCEAN	EN,VH 37,000	425	31	<10
08/16/16	1114	OCEAN	EN,VH 38,000	2,359	<10	<10
08/16/16	1120	OCEAN	EN,VH 39,000	2,187	<10	<10
08/16/16	1126	OCEAN	EN,VH 40,000	3,282	<10	<10
08/16/16	1128	OCEAN	EN,VH 41,000	30	<10	<10
08/16/16	1032	OCEAN	EN,VH 42,000	20	10	<10
08/16/16	1040	OCEAN	EN,VH 43,000	<10	<10	<10
08/16/16	1008	OCEAN	EN,VH 44,000	10	<10	<10
08/16/16	0847	OCEAN	EN,VH 45,000	169	10	<10
08/16/16	0855	OCEAN	EN,VH 46,000	51	31	<10
08/16/16	0904	OCEAN	EN,VH 47,000	41	<10	<10
08/16/16	0916	OCEAN	EN,VH 49,500	20	20	<10
08/16/16	0926	OCEAN	EN,VH 50,000	73	<10	<10
08/16/16	1320	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wahi						
Website (data + list of failures): 8/17/16						
Website (advisory): 8/18/16						
hotline: 8/17/16						
posting: 8/17/16						
Beachwatch (data): 8/19/16 Beachwatch (advisories): 8/19/16						
email: HD + PWA: 8/18/16						

Remove Posts: 8/18/16

Source for failures
 presumed to be a failure of
 sand berm @ Santa Clara River

RUN ON: 08/23/16

WATER QUALITY RESULTS
FROM COLL DATE: 08/23/16
THRU COLL DATE: 08/23/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
08/23/16	1228	OCEAN	EN,VH 29,000	10	<10	<10
08/23/16	1220	OCEAN	EN,VH 30,000	<10	<10	<10
08/23/16	1210	OCEAN	EN,VH 32,000	31	<10	<10
08/23/16	1205	OCEAN	EN,VH 33,000	10	<10	<10
08/23/16	1152	OCEAN	EN,VH 34,000	10	<10	<10
08/23/16	1140	OCEAN	EN,VH 35,000	20	<10	<10
08/23/16	1100	OCEAN	EN,VH 36,000	52	20	<10
08/23/16	1108	OCEAN	EN,VH 37,000	51	<10	<10
08/23/16	1113	OCEAN	EN,VH 38,000	<10	<10	<10
08/23/16	1119	OCEAN	EN,VH 39,000	<10	<10	<10
08/23/16	1124	OCEAN	EN,VH 40,000	10	<10	<10
08/23/16	1013	OCEAN	EN,VH 41,000	20	<10	<10
08/23/16	1020	OCEAN	EN,VH 42,000	<10	<10	<10
08/23/16	1028	OCEAN	EN,VH 43,000	<10	<10	<10
08/23/16	0957	OCEAN	EN,VH 44,000	<10	<10	<10
08/23/16	0936	OCEAN	EN,VH 45,000	10	10	<10
08/23/16	0930	OCEAN	EN,VH 46,000	10	10	<10
08/23/16	0913	OCEAN	EN,VH 47,000	<10	<10	<10
08/23/16	0904	OCEAN	EN,VH 49,500	31	<10	<10
08/23/16	0856	OCEAN	EN,VH 50,000	20	<10	<10
08/23/16	1320	OCEAN	LAB BLANK	<10	<10	<10
Sampled by WHH						
Hotline: 8/24/16						
Website: 8/24/16						
email HD + PWA: 8/24/16						
Beach Watch:						

RUN ON: 08/29/16

WATER QUALITY RESULTS
FROM COLL DATE: 08/29/16
THRU COLL DATE: 08/29/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
08/29/16	1250	OCEAN	EN,VH 29,000	<10	<10	<10
08/29/16	1240	OCEAN	EN,VH 30,000	<10	<10	<10
08/29/16	1230	OCEAN	EN,VH 32,000	20	<10	<10
08/29/16	1222	OCEAN	EN,VH 33,000	<10	<10	<10
08/29/16	1214	OCEAN	EN,VH 34,000	<10	<10	<10
08/29/16	1206	OCEAN	EN,VH 35,000	<10	<10	<10
08/29/16	1056	OCEAN	EN,VH 36,000	86	<10	<10
08/29/16	1100	OCEAN	EN,VH 37,000	118	10	<10
08/29/16	1104	OCEAN	EN,VH 38,000	<10	<10	<10
08/29/16	1122	OCEAN	EN,VH 39,000	<10	<10	<10
08/29/16	1150	OCEAN	EN,VH 40,000	20	10	<10
08/29/16	1012	OCEAN	EN,VH 41,000	10	<10	<10
08/29/16	1018	OCEAN	EN,VH 42,000	10	<10	<10
08/29/16	1026	OCEAN	EN,VH 43,000	<10	<10	<10
08/29/16	0948	OCEAN	EN,VH 44,000	41	10	<10
08/29/16	0926	OCEAN	EN,VH 45,000	10	<10	<10
08/29/16	0918	OCEAN	EN,VH 46,000	10	<10	20
08/29/16	0910	OCEAN	EN,VH 47,000	10	<10	<10
08/29/16	0902	OCEAN	EN,VH 49,500	31	<10	<10
08/29/16	0852	OCEAN	EN,VH 50,000	10	<10	<10
08/29/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wiche						
Website (advisory + data): 8/31/16						
Beachwatch: 8/31/16						
email HD + PWA: 9/1/16						
Hotline: 8/31/16						

RUN ON: 09/06/16

WATER QUALITY RESULTS
FROM COLL DATE: 09/06/16
THRU COLL DATE: 09/06/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
09/06/16	0904	OCEAN	ENVH 1000	<10	<10	<10
09/06/16	0930	OCEAN	ENVH 4000	<10	<10	<10
09/06/16	0944	OCEAN	ENVH 7000	10	10	<10
09/06/16	0953	OCEAN	ENVH 10000	10	<10	<10
09/06/16	1003	OCEAN	ENVH 11000	20	10	<10
09/06/16	1014	OCEAN	ENVH 13000	98	<10	<10
09/06/16	1026	OCEAN	ENVH 14000	41	<10	<10
09/06/16	1036	OCEAN	ENVH 19000	86	10	<10
09/06/16	1052	OCEAN	ENVH 25000	8,664	20	<10
09/06/16	1109	OCEAN	ENVH 35000	<10	<10	<10
09/06/16	1118	OCEAN	ENVH 36000	20	20	<10
09/06/16	1122	OCEAN	ENVH 37000	1,090	189	99
09/06/16	1126	OCEAN	ENVH 38000	<10	<10	<10
09/06/16	1136	OCEAN	ENVH 39000	10	<10	<10
09/06/16	1144	OCEAN	ENVH 40000	<10	<10	<10
09/06/16	1225	OCEAN	ENVH 41000	<10	<10	10
09/06/16	1231	OCEAN	ENVH 42000	10	10	42
09/06/16	1236	OCEAN	ENVH 43000	<10	<10	<10
09/06/16	1303	OCEAN	ENVH 44000	<10	<10	10
09/06/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by WJchl						

website (log): 9/7/16

website (data + advisory): 9/7/16

hotline: 9/7/16

Beach Watch (data + advisory): 9/8/16

posted: 9/7/16 (2 signs)

Removed posts:

email HD + PWA: 9/8/16

RUN ON: 09/13/16

WATER QUALITY RESULTS
FROM COLL DATE: 09/13/16
THRU COLL DATE: 09/13/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
09/13/16	0839	OCEAN	EN,VH 29,000	<10	<10	<10
09/13/16	0951	OCEAN	EN,VH 30,000	20	<10	<10
09/13/16	0901	OCEAN	EN,VH 32,000	<10	<10	<10
09/13/16	0906	OCEAN	EN,VH 33,000	<10	<10	<10
09/13/16	0916	OCEAN	EN,VH 34,000	<10	<10	<10
09/13/16	0921	OCEAN	EN,VH 35,000	10	10	<10
09/13/16	0937	OCEAN	EN,VH 36,000	52	10	10
09/13/16	0942	OCEAN	EN,VH 37,000	253	52	10
09/13/16	0946	OCEAN	EN,VH 38,000	10	<10	<10
09/13/16	0953	OCEAN	EN,VH 39,000	<10	<10	<10
09/13/16	0958	OCEAN	EN,VH 40,000	41	20	20
09/13/16	1019	OCEAN	EN,VH 41,000	<10	<10	<10
09/13/16	1028	OCEAN	EN,VH 42,000	<10	<10	<10
09/13/16	****	OCEAN	EN,VH 43,000	NO	SAMPLE	COLLECTED
09/13/16	1104	OCEAN	EN,VH 44,000	<10	<10	<10
09/13/16	1131	OCEAN	EN,VH 45,000	<10	<10	<10
09/13/16	1142	OCEAN	EN,VH 46,000	<10	<10	<10
09/13/16	1149	OCEAN	EN,VH 47,000	20	<10	<10
09/13/16	1201	OCEAN	EN,VH 49,500	31	<10	<10
09/13/16	1210	OCEAN	EN,VH 50,000	<10	<10	<10
09/13/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Dragon						
website (advisory + date): 9/14/16						
hotline: 9/14/16						
beach watch: 9/15/16						
email HD + PWA:						
pull sign@ 37000: 9/14/16						

pull press release: 9/14/16

RUN ON: 09/19/16

WATER QUALITY RESULTS
FROM COLL DATE: 09/19/16
THRU COLL DATE: 09/19/16
LOCATION: ENVH, ENVH

[illegible]

RUN ON: 09/26/16

WATER QUALITY RESULTS
FROM COLL DATE: 09/26/16
THRU COLL DATE: 09/26/16
LOCATION: ENVH, ENVH

[illegible]

RUN ON: 10/03/16

WATER QUALITY RESULTS
FROM COLL DATE: 10/03/16
THRU COLL DATE: 10/03/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
10/03/16	1228	OCEAN	EN,VH 29,000	20	10	<10
10/03/16	1221	OCEAN	EN,VH 30,000	20	20	<10
10/03/16	1212	OCEAN	EN,VH 32,000	20	20	<10
10/03/16	1205	OCEAN	EN,VH 33,000	10	10	<10
10/03/16	1158	OCEAN	EN,VH 34,000	31	10	<10
10/03/16	1150	OCEAN	EN,VH 35,000	10	<10	<10
10/03/16	1102	OCEAN	EN,VH 36,000	10	<10	<10
10/03/16	1106	OCEAN	EN,VH 37,000	10	<10	<10
10/03/16	1110	OCEAN	EN,VH 38,000	52	<10	<10
10/03/16	1116	OCEAN	EN,VH 39,000	<10	<10	<10
10/03/16	1132	OCEAN	EN,VH 40,000	20	20	<10
10/03/16	1025	OCEAN	EN,VH 41,000	146	41	<10
10/03/16	1030	OCEAN	EN,VH 42,000	30	<10	<10
10/03/16	1038	OCEAN	EN,VH 43,000	30	<10	<10
10/03/16	1002	OCEAN	EN,VH 44,000	20	<10	<10
10/03/16	0854	OCEAN	EN,VH 45,000	10	10	<10
10/03/16	0902	OCEAN	EN,VH 46,000	10	<10	<10
10/03/16	0908	OCEAN	EN,VH 47,000	<10	<10	<10
10/03/16	0918	OCEAN	EN,VH 49,500	<10	<10	<10
10/03/16	0830	OCEAN	EN,VH 50,000	<10	<10	<10
10/03/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wahl						
update website (advisory + data): 10/5/16						
Hotline: 10/5/16						
email HD + RWA: 10/6/16						

Bench Watch: 10/6/16

RUN ON: 10/10/16

WATER QUALITY RESULTS
FROM COLL DATE: 10/10/16
THRU COLL DATE: 10/10/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
10/10/16	1233	OCEAN	EN,VH 29,000	<10	<10	<10
10/10/16	1223	OCEAN	EN,VH 30,000	10	10	<10
10/10/16	1212	OCEAN	EN,VH 32,000	<10	<10	<10
10/10/16	1208	OCEAN	EN,VH 33,000	<10	<10	<10
10/10/16	1158	OCEAN	EN,VH 34,000	10	<10	<10
10/10/16	1150	OCEAN	EN,VH 35,000	10	10	<10
10/10/16	1106	OCEAN	EN,VH 36,000	<10	<10	<10
10/10/16	1110	OCEAN	EN,VH 37,000	399	108	<10
10/10/16	1115	OCEAN	EN,VH 38,000	10	<10	<10
10/10/16	1120	OCEAN	EN,VH 39,000	<10	<10	<10
10/10/16	1134	OCEAN	EN,VH 40,000	<10	<10	<10
10/10/16	1025	OCEAN	EN,VH 41,000	<10	<10	<10
10/10/16	1028	OCEAN	EN,VH 42,000	<10	<10	<10
10/10/16	1036	OCEAN	EN,VH 43,000	<10	<10	<10
10/10/16	0956	OCEAN	EN,VH 44,000	10	10	<10
10/10/16	0836	OCEAN	EN,VH 45,000	<10	<10	<10
10/10/16	0844	OCEAN	EN,VH 46,000	<10	<10	<10
10/10/16	0852	OCEAN	EN,VH 47,000	10	10	10
10/10/16	0904	OCEAN	EN,VH 49,500	30	<10	<10
10/10/16	0916	OCEAN	EN,VH 50,000	10	<10	<10
10/10/16	1310	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Wale						
hotline:						
website (advisory + data): 10/12/16						
email: HD + PWA:						
Beachwatch (data): 10/12/16						

RUN ON: 10/17/16

WATER QUALITY RESULTS
FROM COLL DATE: 10/17/16
THRU COLL DATE: 10/17/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
10/17/16	1242	OCEAN	EN,VH 29,000	10	10	<10
10/17/16	1238	OCEAN	EN,VH 30,000	31	10	<10
10/17/16	1228	OCEAN	EN,VH 32,000	41	10	<10
10/17/16	1222	OCEAN	EN,VH 33,000	41	20	10
10/17/16	1212	OCEAN	EN,VH 34,000	31	<10	10
10/17/16	1205	OCEAN	EN,VH 35,000	52	<10	20
10/17/16	1128	OCEAN	EN,VH 36,000	31	<10	10
10/17/16	1132	OCEAN	EN,VH 37,000	529	52	20
10/17/16	1135	OCEAN	EN,VH 38,000	171	10	10
10/17/16	1141	OCEAN	EN,VH 39,000	10	<10	10
10/17/16	1146	OCEAN	EN,VH 40,000	10	<10	10
10/17/16	1044	OCEAN	EN,VH 41,000	1,012	233	31
10/17/16	1048	OCEAN	EN,VH 42,000	350	41	20
10/17/16	1057	OCEAN	EN,VH 43,000	307	41	53
10/17/16	1018	OCEAN	EN,VH 44,000	10	<10	<10
10/17/16	0955	OCEAN	EN,VH 45,000	122	<10	<10
10/17/16	0945	OCEAN	EN,VH 46,000	20	<10	<10
10/17/16	0935	OCEAN	EN,VH 47,000	20	<10	<10
10/17/16	0925	OCEAN	EN,VH 49,500	<10	<10	10
10/17/16	0916	OCEAN	EN,VH 50,000	85	20	31
10/17/16	1320	OCEAN	LAB BLANK	<10	<10	<10

Sampled by Wahl
 pulled sign:
 website (advisory + data): 10/19/16
 website (log): 10/18/16
 email: JD + PWA 10/20/16
 Beach Watcher (advisory + sign):
 hotline: 10/19/16
 resample + posted 4100 - one sign @ sample location
 + one at front of pier: 10/18/16

RUN ON: 10/24/16

WATER QUALITY RESULTS
FROM COLL DATE: 10/25/16
THRU COLL DATE: 10/25/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
10/24/16	1320	OCEAN	EN,VH 29,000	<10	<10	<10
10/24/16	1312	OCEAN	EN,VH 30,000	<10	<10	<10
10/24/16	1300	OCEAN	EN,VH 32,000	<10	<10	<10
10/24/16	1255	OCEAN	EN,VH 33,000	10	<10	<10
10/24/16	1240	OCEAN	EN,VH 34,000	<10	<10	<10
10/24/16	1231	OCEAN	EN,VH 35,000	97	<10	<10
10/24/16	1144	OCEAN	EN,VH 36,000	10	<10	<10
10/24/16	1149	OCEAN	EN,VH 37,000	20	<10	<10
10/24/16	1158	OCEAN	EN,VH 38,000	20	10	<10
10/24/16	1205	OCEAN	EN,VH 39,000	<10	<10	<10
10/24/16	1210	OCEAN	EN,VH 40,000	10	<10	<10
10/24/16	1053	OCEAN	EN,VH 41,000	<10	<10	<10
10/24/16	1100	OCEAN	EN,VH 42,000	20	<10	<10
10/24/16	1108	OCEAN	EN,VH 43,000	<10	<10	<10
10/24/16	1032	OCEAN	EN,VH 44,000	31	10	<10
10/24/16	1010	OCEAN	EN,VH 45,000	<10	<10	<10
10/24/16	0956	OCEAN	EN,VH 46,000	20	<10	<10
10/24/16	0940	OCEAN	EN,VH 47,000	<10	<10	<10
10/24/16	0928	OCEAN	EN,VH 49,500	31	<10	<10
10/24/16	0918	OCEAN	EN,VH 50,000	10	<10	<10
10/24/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by L. Khl.						
website (advisory + date) : 10/26/16						
hotline:						
email HD+PWA : 10/26/16						
Beach Watch:						

RUN ON: 10/31/16

WATER QUALITY RESULTS
FROM COLL DATE: 10/31/16
THRU COLL DATE: 10/31/16
LOCATION: ENVH, ENVH

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
10/31/16	1233	OCEAN	EN,VH 29,000	443	<10	<10
10/31/16	1225	OCEAN	EN,VH 30,000	327	<10	<10
10/31/16	1211	OCEAN	EN,VH 32,000	311	<10	<10
10/31/16	1205	OCEAN	EN,VH 33,000	313	<10	10
10/31/16	1158	OCEAN	EN,VH 34,000	355	10	<10
10/31/16	1154	OCEAN	EN,VH 35,000	279	<10	<10
10/31/16	1112	OCEAN	EN,VH 36,000	265	31	<10
10/31/16	1118	OCEAN	EN,VH 37,000	2,500	441	124
10/31/16	1124	OCEAN	EN,VH 38,000	75	10	<10
10/31/16	1130	OCEAN	EN,VH 39,000	10	<10	<10
10/31/16	1136	OCEAN	EN,VH 40,000	<10	<10	<10
10/31/16	1034	OCEAN	EN,VH 41,000	<10	<10	10
10/31/16	1040	OCEAN	EN,VH 42,000	52	31	<10
10/31/16	1046	OCEAN	EN,VH 43,000	20	10	<10
10/31/16	1018	OCEAN	EN,VH 44,000	52	<10	10
10/31/16	0958	OCEAN	EN,VH 45,000	41	<10	<10
10/31/16	0940	OCEAN	EN,VH 46,000	41	<10	<10
10/31/16	0934	OCEAN	EN,VH 47,000	109	85	<10
10/31/16	0924	OCEAN	EN,VH 49,500	132	<10	<10
10/31/16	0912	OCEAN	EN,VH 50,000	52	<10	10
10/31/16	1300	OCEAN	LAB BLANK	<10	<10	<10
Sampled by: Wiche/Dinh						
Beach 37000 resampled + posted on 11/1/16						
Website (advisory): no change - rain advisory (date) 11/2/16 in effect						
Flag: 11/1/16						
rain advisory: 10/28/16						
Hotline: rain advisory in effect - no change yet for 27000						

email HDP/PLA: 11/3/16

Beachwatch (date): 11/3/16
 (rain advisory): 11/3/16
 (37000 advisory): 11/3/16

**WATER QUALITY RESULTS
FROM COLL DATE: 11/01/16
THRU COLL DATE: 11/01/16
LOCATION: ENVH, ENVH**

**WATER QUALITY RESULTS
FROM COLL DATE: 11/01/16
THRU COLL DATE: 11/01/16
LOCATION: ENVH, ENVH**

hotline: 11/2/16

RUN ON: 11/07/16

WATER QUALITY RESULTS
FROM COLL DATE: 11/07/16
THRU COLL DATE: 11/07/16
LOCATION: ENVH, ENVH

**** HOLIDAY/WINTER COLLECTION ****

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
11/07/16	0903	OCEAN	ENVH 1000	10	<10	20
11/07/16	0936	OCEAN	ENVH 4000	<10	<10	<10
11/07/16	0945	OCEAN	ENVH 7000	<10	<10	<10
11/07/16	1000	OCEAN	ENVH 10000	20	<10	<10
11/07/16	1008	OCEAN	ENVH 11000	30	<10	<10
11/07/16	1023	OCEAN	ENVH 13000	20	<10	<10
11/07/16	1030	OCEAN	ENVH 14000	10	<10	20
11/07/16	1046	OCEAN	ENVH 19000	41	<10	<10
11/07/16	1109	OCEAN	ENVH 25000	10	<10	<10
11/07/16	1133	OCEAN	ENVH 35000	<10	<10	<10
11/07/16	1140	OCEAN	ENVH 36000	<10	<10	<10
11/07/16	1144	OCEAN	ENVH 37000	41	<10	10
11/07/16	1150	OCEAN	ENVH 38000	<10	<10	<10
11/07/16	1154	OCEAN	ENVH 39000	<10	<10	<10
11/07/16	1200	OCEAN	ENVH 40000	<10	<10	<10
11/07/16	1228	OCEAN	ENVH 41000	<10	<10	<10
11/07/16	1234	OCEAN	ENVH 42000	<10	<10	<10
11/07/16	1239	OCEAN	ENVH 43000	<10	<10	<10
11/07/16	1300	OCEAN	ENVH 44000	<10	<10	<10
11/07/16	1340	OCEAN	LAB BLANK	<10	<10	<10

website (advisory & data): 11/8/16

hotline: 11/8/16

email HD + PWA: 11/10/16

Beachwatch: 11/10/16

RUN ON: 11/14/16

WATER QUALITY RESULTS
FROM COLL DATE: 11/14/16
THRU COLL DATE: 11/14/16
LOCATION: ENVH, ENVH

**** HOLIDAY/WINTER COLLECTION ****

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
11/14/16	0910	OCEAN	ENVH 1000	504	63	31
11/14/16	0947	OCEAN	ENVH 4000	86	20	<10
11/14/16	0956	OCEAN	ENVH 7000	857	565	192
11/14/16	1004	OCEAN	ENVH 10000	221	20	87
11/14/16	1013	OCEAN	ENVH 11000	158	41	150
11/14/16	1028	OCEAN	ENVH 13000	63	10	<10
11/14/16	1043	OCEAN	ENVH 14000	31	20	10
11/14/16	1053	OCEAN	ENVH 19000	10	<10	<10
11/14/16	1107	OCEAN	ENVH 25000	31	31	<10
11/14/16	1128	OCEAN	ENVH 35000	<10	<10	<10
11/14/16	1142	OCEAN	ENVH 36000	<10	<10	10
11/14/16	1146	OCEAN	ENVH 37000	450	75	64
11/14/16	1151	OCEAN	ENVH 38000	41	<10	<10
11/14/16	1157	OCEAN	ENVH 39000	<10	<10	10
11/14/16	1203	OCEAN	ENVH 40000	<10	<10	<10
11/14/16	1230	OCEAN	ENVH 41000	74	31	10
11/14/16	1235	OCEAN	ENVH 42000	10	<10	<10
11/14/16	1241	OCEAN	ENVH 43000	10	<10	<10
11/14/16	1300	OCEAN	ENVH 44000	41	20	<10
11/14/16	1320	OCEAN	LAB BLANK	<10	<10	<10

RUN ON: 11/21/16

WATER QUALITY RESULTS
FROM COLL DATE: 11/21/16
THRU COLL DATE: 11/21/16
LOCATION: ENVH, ENVH

**** HOLIDAY/WINTER COLLECTION ****

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
11/21/16	0910	OCEAN	ENVH 1000	41	20	20
11/21/16	0950	OCEAN	ENVH 4000	10	10	<10
11/21/16	1000	OCEAN	ENVH 7000	<10	<10	<10
11/21/16	1020	OCEAN	ENVH 10000	146	63	42
11/21/16	1028	OCEAN	ENVH 11000	10	<10	<10
11/21/16	1043	OCEAN	ENVH 13000	169	52	64
11/21/16	1102	OCEAN	ENVH 14000	414	74	99
11/21/16	1100	OCEAN	ENVH 19000	20	20	20
11/21/16	1128	OCEAN	ENVH 25000	536	158	87
11/21/16	1145	OCEAN	ENVH 35000	20	<10	<10
11/21/16	1155	OCEAN	ENVH 36000	51	10	42
11/21/16	1200	OCEAN	ENVH 37000	72	30	31
11/21/16	1202	OCEAN	ENVH 38000	73	31	20
11/21/16	1208	OCEAN	ENVH 39000	20	<10	<10
11/21/16	1214	OCEAN	ENVH 40000	40	10	<10
11/21/16	1240	OCEAN	ENVH 41000	81	41	31
11/21/16	1245	OCEAN	ENVH 42000	128	62	53
11/21/16	1251	OCEAN	ENVH 43000	84	20	20
11/21/16	1307	OCEAN	ENVH 44000	84	20	31
11/21/16	1330	OCEAN	LAB BLANK	<10	<10	<10

RUN ON: 11/28/16

WATER QUALITY RESULTS
FROM COLL DATE: 11/28/16
THRU COLL DATE: 11/28/16
LOCATION: ENVH, ENVH

** HOLIDAY/WINTER COLLECTION **

Date	Time	Source	Specimen ID	T. COLI MPN/100 ml	E. COLI MPN/100 ml	ENTERO MPN/100 ml
11/28/16	0855	OCEAN	ENVH 1000	121	31	<10
11/28/16	0932	OCEAN	ENVH 4000	63	20	<10
11/28/16	0943	OCEAN	ENVH 7000	318	<10	<10
11/28/16	0950	OCEAN	ENVH 10000	404	<10	20
11/28/16	1000	OCEAN	ENVH 11000	63	20	10
11/28/16	1014	OCEAN	ENVH 13000	52	<10	10
11/28/16	1026	OCEAN	ENVH 14000	20	<10	<10
11/28/16	1035	OCEAN	ENVH 19000	1,421	52	42
11/28/16	1055	OCEAN	ENVH 25000	313	<10	<10
11/28/16	1113	OCEAN	ENVH 35000	216	<10	<10
11/28/16	1123	OCEAN	ENVH 36000	2,187	<10	<10
11/28/16	1127	OCEAN	ENVH 37000	1,789	10	20
11/28/16	1150	OCEAN	ENVH 38000	155	<10	<10
11/28/16	1145	OCEAN	ENVH 39000	195	<10	<10
11/28/16	1135	OCEAN	ENVH 40000	132	<10	<10
11/28/16	1210	OCEAN	ENVH 41000	110	63	<10
11/28/16	1216	OCEAN	ENVH 42000	63	10	<10
11/28/16	1221	OCEAN	ENVH 43000	86	<10	<10
11/28/16	1240	OCEAN	ENVH 44000	74	<10	10
11/28/16	1330	OCEAN	LAB BLANK	<10	<10	<10
Sampled by Watch 11/28/16						
Rain press release: 11/28/16						
Rain (advisory + hotline + log): 11/28/16						

Website (data) 11/29/16

publ rain advisory + update website advisory: 11/30/16

close out rain (log): 11/30/16

hotline (no posting): 11/30/16

Beach watch (data and rain advisory): 11/30/16

email HD + PWA: 11/30/16



JANUARY 2017

Ventura River Estuary Trash TMDL 2015-2016 TMRP Annual Report

prepared by

VENTURA HILLSIDE CONSERVANCY

submitted to

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD,
LOS ANGELES REGION

submitted by

CITY OF VENTURA, COUNTY OF VENTURA, VENTURA COUNTY
WATERSHED PROTECTION DISTRICT, PARTICIPANTS IN THE VENTURA
COUNTY AGRICULTURAL IRRIGATED LANDS GROUP, CALIFORNIA
DEPARTMENT OF FOOD AND AGRICULTURE, CALIFORNIA DEPARTMENT
OF STATE PARKS, AND CALIFORNIA DEPARTMENT OF TRANSPORTATION



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Introduction

This Annual Report is being submitted to fulfill the compliance requirements of the Amendments to the Water Quality Control Plan – Los Angeles Region for the Ventura River Estuary Trash Total Maximum Daily Load (Trash TMDL), Resolution No. R4-2007-008 (effective March 6, 2008). The purpose of this report is to present the results of the monitoring efforts conducted in accordance with the Trash Monitoring Reporting Plan (TMRP) and Minimum Frequency Assessment Collection/Best Management Practice (MFAC/BMP) Program developed to meet the requirements of the Trash TMDL.

The initial TMRP, which was approved in 2009 by the California Regional Water Quality Control Board, Los Angeles Region (Regional Board), was revised in 2014 to more effectively target the disbandment of homeless encampments in the Ventura River Estuary (Estuary), which have been determined to be the primary source of trash in the TMDL compliance area. An Addendum No. 1 to the TMRP was submitted on April 30, 2014 and a revised Addendum was submitted on October 22, 2014 addressing comments from Regional Board staff. The TMRP and MFAC/BMP Program are designed to prioritize the use of resources to implement actions effective in reducing trash in the Estuary, while still providing a monitoring approach that will allow for an evaluation of the effectiveness of the MFAC/BMP Program and support identification of any needed adjustments to the MFAC/BMP Program. The responsible parties are still waiting for approval of the Addendum No. 1; however, Regional Board staff indicated the responsible parties should implement the revised TMRP program while awaiting approval.

In the responsible parties' TMRP revision request letter, dated October 9, 2013, the responsible parties stated additional time was needed to develop the details of the monitoring approach, particularly the most effective locations to implement the patrols and visual assessments. As such, the responsible parties proposed implementing an interim MFAC/BMP Program to begin in October 2014 while the responsible parties developed the revised MFAC/BMP Program and Regional Board staff reviewed and approved the revised MFAC/BMP Program. An interim MFAC/BMP Program was necessary to support development of some aspects of the monitoring approach, facilitate transition to a more effective clean-up and trash prevention program, and avoid the necessity of continuing to count pieces of trash while the responsible parties developed the detailed TMRP. The interim MFAC/BMP Program implemented by the responsible parties was as follows:

1. Conducted clean-up of all Estuary parcels within the TMDL compliance area by mid-November 2013 as the initial quarterly event.
2. Began initial patrols to determine the route(s) that will be used for visual assessments and identified the preferred routes by January 2014.
3. Formalized Memorandum of Agreement with Ventura Hillside Conservancy to organize and manage volunteer cleanup events and conduct trash monitoring activities.
4. Conducted regularly scheduled clean-up events in the Estuary beginning in March 2014, which were additional to the required collection events for the MFAC/BMP Program.

In addition, the responsible parties conducted several initial assessments in May and June 2014 and an initial collection event in May 2014 to test the applicability of the revised MFAC/BMP Program. The revised MFAC/BMP Program began in July 2014.

This Annual Report includes the following information from third-year monitoring conducted under the revised TMRP and MFAC/BMP Program:

- Monitoring Summary
- MFAC Events/BMP Implementation Summary
- MFAC/BMP Program Evaluation and Revision Recommendations

The efforts to implement the Trash TMDL are being completed on behalf of the responsible parties to the Trash TMDL as listed in **Table 1**. The efforts to implement the Trash TMDL requirements for nonpoint sources are focused within the Estuary and the parcels adjacent to the Estuary. **Table 2** presents the names of the parcels within the Estuary, which were grouped into four MFAC areas identified for the MFAC/BMP Program implementation. **Figure 1** shows the locations of the parcels within the Estuary. Per 2014 revised MFAC/BMP Program, the cleanup and monitoring efforts included the whole TMDL compliance area including areas that are not part of the eight parcels listed in **Table 2** and shown in **Figure 1** including the area under the Main Street Bridge, the area under the US 101 Bridge, and the area under the railroad bridge between MFAC Area 1 and MFAC Area 2. In addition, both County of Ventura and City of Ventura installed required full trash capture devices within their respective jurisdictions draining to the MS4 within the Trash TMDL Staff Report-defined Estuary Sub-watershed area.

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

Responsible Party	Nonpoint Source (NPS)	Point Source (PS)
City of Ventura (City)	X	X
Ventura County (County)	X	X
Ventura County Watershed Protection District (VCWPD)	X	X
California Department of Food & Agriculture (Ventura Fairgrounds)	X	X
California Department of Transportation (Caltrans)	X ¹	X
California Department of Parks and Recreation	X	--
Participants in the VCAILG ²	X	--

1. Caltrans was not assigned a Load Allocation, yet it is participating in the MFAC/BMP Program to meet the Trash TMDL goals.

2. Ventura County Agricultural Irrigated Lands Group.

Table 2. Estuary Parcels by MFAC Area

	MFAC Area 1	MFAC Area 2	MFAC Area 3	MFAC Area 4
Parcel Owner	State of California Department of Parks and Recreation	State of California Department of Parks and Recreation	Ventura Beach RV Resort, Inc.	Wood-Claeyssens Foundation
	City of San Buenaventura	State of California Department of Parks and Recreation	Ventura Hillside Conservancy	Ventura County Watershed Protection District



Figure 1. MFAC/BMP Program Monitoring Area and Assessment/Patrol Route

Monitoring Summary

ASSESSMENTS AND COLLECTION EVENTS

The responsible parties implemented the revised MFAC/BMP Program (as of July 2014) from the October 2015 to September 2016 reporting period. Upon implementation of the revised MFAC/BMP Program, the responsible parties conducted regular visual trash assessment surveys along a pre-defined route in the Estuary on a rotating schedule each month to ensure the entire Estuary, as defined in the Trash TMDL, was covered on a quarterly basis. The assessment route was designed to include historic in-Estuary TMRP monitoring locations in addition to other areas on all parcels of the Estuary to reflect the new MFAC/BMP Program. The assessment route is shown in **Figure 1**. The visual trash assessment surveys were conducted in accordance with the revised TMRP. However, the responsible parties conducted significantly more assessments than required in the revised TMRP, which is one assessment per quarter. This is due to this monitoring year being a transition year between the previous MFAC/BMP Program and the revised MFAC/BMP Program. Additional cleanups have been determined to be necessary to address legacy trash that has accumulated in the Estuary. After the legacy trash has been removed, the revised TMRP frequency will be implemented.

The responsible parties also conducted trash collection events utilizing information from the monitoring program and from the assessments to determine the locations to focus trash collection efforts.

In addition, the responsible parties conducted regularly scheduled patrols along the assessment route as shown in **Figure 1**. The patrols were conducted to eliminate existing homeless encampments and prevent the establishment of new homeless encampments and to assess trash levels, as homeless individuals and homeless encampments are the main nonpoint sources of trash for the Estuary. The responsible parties averaged up to two patrols per week in areas exhibiting large homeless populations and averaged up to two patrols per month in areas exhibiting small homeless populations. The responsible parties conducted 125 patrols from October 2015 to December 2016.

A summary of the assessment dates, the collection event dates, and the patrol dates is presented in **Table 3**. Assessment and Collection Worksheets contains the Trash Visual Survey Worksheets and the Collection Event Worksheets for all MFAC Events conducted during October 2015 to September 2016.

Table 3. Assessment, Collection, and Patrol Dates for October 2015-September 2016

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	Q1			Q2			Q3			Q4		
Assessment Dates												
MFAC Area 1	10/9/15	11/30/15	12/28/15	1/14/16	2/26/16	3/9/16	4/14/16	5/5/16	6/2/16	7/13/16	8/15/16	9/13/16
MFAC Area 2	10/9/15	11/30/15	12/28/15	1/14/16	2/26/16	3/9/16	4/14/16	5/5/16	6/2/16	7/13/16	8/15/16	9/13/16
MFAC Area 3	10/9/15	11/30/15	12/28/15	1/14/16	2/26/16	3/9/16	4/14/16	5/5/16	6/2/16	7/13/16	8/15/16	9/13/16
MFAC Area 4	10/9/15	11/30/15	12/28/15		2/26/16	3/9/16			6/2/16			9/13/16
Collection Dates												
MFAC Area 1											8/20/16	
MFAC Area 2									6/18/16	7/16/16		9/17/16
MFAC Area 3	10/3/15						4/16/16	5/21/16	6/18/16	7/16/16	8/20/16	9/17/16
MFAC Area 4												9/17/16
Patrol Dates												
10/1/15	12/28/15	3/3/16	5/5/16	7/6/16			9/1/16		10/20/16		11/29/16	
10/2/15	1/8/16	3/9/16	5/12/16	7/13/16			9/6/16		10/21/16		12/1/16	
10/5/15	1/14/16	3/14/16	5/19/16	7/18/16			9/13/16		10/24/16		12/6/16	
10/9/15	1/22/16	3/22/16	5/23/16	7/27/16			9/19/16		11/1/16		12/7/16	
11/30/15	1/28/16	3/30/16	6/2/16	8/3/16			9/23/16		11/4/16		12/14/16	
12/4/15	2/5/16	4/6/16	6/8/16	8/9/16			9/29/16		11/7/16		12/21/16	
12/7/15	2/11/16	4/14/16	6/13/16	8/11/16			10/4/16		11/14/16		12/27/16	
12/14/15	2/18/16	4/18/16	6/22/16	8/15/16			10/10/16		11/18/16		12/30/16	
12/21/15	2/26/16	4/26/16	6/28/16	8/23/16			10/17/16		11/21/16			

ASSESSMENT FINDINGS

The goal of the MFAC/BMP Program is to ensure the parcels in the Estuary are at a Category 1 level of trash based on the information collected during Estuary visual assessments.

The three Trash Assessment Categories of the MFAC/BMP Program are:

- Category 1 – Represents the SWAMP Category “Optimal”
- Category 2 – Represents the SWAMP Category “Suboptimal”
- Category 3 – Represents the SWAMP Category “Poor”

The definition of Category 1 is:

- “On first glance, no trash is visible. Little or no trash (<10 pieces) evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.”

The definition of Category 2 is:

- “On first glance, low to medium levels of trash are evident (10 – 50 pieces). Stream, bank surfaces, and riparian zone contain some litter and debris. Possible evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, or clothing.”

The definition of Category 3 is:

- “On first glance, medium to high levels of trash (51-100 pieces) are visible at stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris. Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, or clothing.”

There were multiple locations on the parcels within the four MFAC Areas that were assessed during the MFAC Events. These areas were located along the assessment route and in other areas of the Estuary identified through the patrols. Based on the trash conditions at the multiple assessed locations, the Ventura Hillside Conservancy determined the overall percentage of the MFAC Areas that were in each of the Trash Assessment Categories. **Table 4** presents a summary of the Trash Assessment Categories for MFAC Areas resulting from the assessments conducted during 2015-2016. Assessment and Collection Worksheets contains the Trash Visual Survey Worksheets and MFAC Events Worksheets conducted during 2015-2016.

Table 4. Percent of MFAC Area by Assessment Category

Quarter 1*				
Assessment Area	Category 1	Category 2	Category 3	Notes
MFAC Area 1	100%	-	-	No trash was observed in MFAC area 1 during quarter 1
MFAC Area 2	90%	6%	4%	
MFAC Area 3	96%	4%	0%	No trash was observed in MFAC area 3 during quarter 1
MFAC Area 4	98%	2%	-	No trash observed in MFAC area 4 during quarter 1 was category 3
*October visual trash assessments were not included in Quarter 1 (not clear as to which MFAC areas were being referenced in assessment reports due to insufficient notes during a change in staff)				
Quarter 2				
Assessment Area	Category 1	Category 2	Category 3	Notes
MFAC Area 1	92%	5%	3%	
MFAC Area 2	89%	6%	5%	
MFAC Area 3	93%	4%	3%	
MFAC Area 4	100%	-	-	No trash was observed in MFAC area 4 during quarter 2
Quarter 3				
Assessment Area	Category 1	Category 2	Category 3	Notes
MFAC Area 1	90%	6%	4%	
MFAC Area 2	91%	5%	4%	
MFAC Area 3	93%	5%	2%	
MFAC Area 4	99%	1%	-	No trash observed in MFAC area 4 during quarter 3 was category 3
Quarter 4				
Assessment Area	Category 1	Category 2	Category 3	Notes
MFAC Area 1	94%	4%	2%	
MFAC Area 2	93%	4%	3%	
MFAC Area 3	96%	4%	-	No trash observed in MFAC area 3 during quarter 4 was category 3
MFAC Area 4	99%	0.5%	0.5%	

MFAC Events/BMP Implementation Summary

To ensure the parcels are all within Category 1, the MFAC/BMP Program is continuously evaluated and modified using the following adaptive management approach:

1. Estuary parcels in Category 1 for the monitoring event conducted prior to a scheduled MFAC Event are noted and any trash observed is collected during the visual survey. If no potential high trash generating areas are identified through the patrol of the parcel, the MFAC Event is not conducted. If potential high trash generating areas are identified by the patrols, then the MFAC Event focusing on those areas of the parcel that require clean-up.
2. Monitoring sites in Category 2 are evaluated to determine if additional BMPs are needed to reduce the accumulation of trash between monitoring events (i.e., visual surveys). The

types of trash, likely sources, and observed trends in trash amounts are considered in determining if modifications to the MFAC/BMP Program are necessary to move these sites to Category 1.

3. MFAC parcels that have Category 3 levels of trash for two consecutive quarters are targeted for more frequent patrols and/or more frequent clean-ups (depending on the identified primary source of trash) until the parcels reach Category 1 levels of trash for two consecutive visual surveys.

This following section provides the results of the collection events and the results of the BMPs implemented related to reducing trash within the Estuary and from adjacent land areas.

MFAC COLLECTION EVENTS AND ADDITIONAL CLEAN-UP EVENTS

One facet of the MFAC/BMP Program is to clean up any trash found through the assessments. This is done to ensure zero pieces of trash are found after the assessment. **Table 5** presents the trash collected during all collection events during 2015-2016. Assessment and Collection Worksheets contains the Collection Event Worksheets for MFAC Events conducted during 2015-2016 (**Appendix 1**). Only third Saturday of the month volunteer clean up events have MFAC Event Worksheets; all other clean up events listed in Table 5 were smaller scale, hour to two hour long events by VHC volunteers who chose to pick up trash in their own time outside of monthly volunteer events. Another facet of the MFAC/BMP Program is to conduct additional clean-ups in the Estuary if it is found that trash is accumulating in deleterious amounts between assessments. The Ventura Hillsides Conservancy and volunteers conducted 63 clean-ups in the Estuary to address high trash accumulation areas. Parcels 1, 2, and 3 were known to have legacy trash issues, and therefore were targeted for additional clean-ups from the beginning of the 2015-2016 monitoring year. Clean-up provided in **Appendix 2** include photos of the types of trash removed during collection events and additional clean-up events.

Table 5. Summary of Trash Collected during the MFAC Collection and Additional Clean-up Events

Date	MFAC Area 1	MFAC Area 2	MFAC Area 3	MFAC Area 4
10/3/15			26 bags/ 650 lbs	
4/16/16			27/ 675 lbs	
5/12/16			5/ 125 lbs	
5/21/16			35 /875 lbs	
6/18/16		4/ 100 lbs	28/ 700 lbs	
7/12/16			1/ 25 lbs	
7/16/16		13/ 325 lbs	14/ 350 lbs	
8/20/16	30/ 750 lbs		2/ 50 lbs	
8/29/16		6/ 150 lbs		
9/1/16			2/ 50 lbs	
9/14/16			2/ 50 lbs	
9/15/16	4/ 100 lbs			
9/17/16		15/ 375 lbs	15/ 375 lbs	12/ 300 lbs
9/20/16		2/ 50 lbs		
9/28/16	2/ 50 lbs	2/ 50 lbs		
10/7/16	3/ 75 lbs			
10/9/16	2/ 50 lbs			
10/13/16		3/ 75 lbs		
10/15/16			25/ 625 lbs	
10/24/16	1/ 25 lbs			
10/27/16	2/ 50 lbs			
11/2/16		1/ 25 lbs		
11/3/16		1/ 25 lbs		
11/4/16		1/ 25 lbs		
11/5/16	2/ 50 lbs			
11/8/16		1/ 25 lbs		
11/10/16		2/ 50 lbs		
11/12/16		1/ 25 lbs		
11/13/16		1/ 25 lbs		
11/15/16	1/ 25 lbs	2/ 50 lbs		
11/16/16		2/ 50 lbs		
11/17/16		1/ 25 lbs	4/ 100 lbs	

Table5. Summary of Trash Collected during the MFAC Collection and Additional Clean-up Events (Continuation)

Date	MFAC Area 1	MFAC Area 2	MFAC Area 3	MFAC Area 4
11/18/16	1/ 25 lbs	2/ 50 lbs		
11/19/16		2/ 50 lbs		
11/20/16		1/ 25 lbs		
11/21/16		1/ 25 lbs		
11/22/16		2/ 50 lbs	1/ 25 lbs	
11/23/16	1/ 25 lbs			
11/30/16		1/ 25 lbs		
12/1/16		2/ 50 lbs		
12/2/16	1/ 25 lbs			
12/3/16	1/ 25 lbs			
12/4/16	1/ 25 lbs			
12/5/16	1/ 25 lbs			
12/6/16	1/ 25 lbs	2/ 50 lbs		
12/7/16	1/ 25 lbs			
12/8/16		2/ 50 lbs		
12/9/16		1/ 25 lbs		
12/12/16		2/ 50 lbs		
12/13/16		2/ 50 lbs		
12/14/16		4/ 100 lbs		
12/16/16			2/ 50 lbs	
12/17/16		2/ 50 lbs	1/ 25 lbs	
12/18/16	1/ 25 lbs			
12/19/16	1/ 25 lbs			
12/20/16		1/ 25 lbs		
12/21/16			1/ 25 lbs	
12/22/16	1/ 25 lbs			
12/25/16			1/ 25 lbs	
12/26/16			1/ 25 lbs	
12/27/16			1/ 25 lbs	
12/30/16			1/ 25 lbs	
12/31/16			3/ 75 lbs	

lbs=pounds (1 bag roughly equal to 25 lbs)

BMP IMPLEMENTATION

This section describes the BMPs implemented by the responsible parties within the Estuary and on land areas adjacent to the Estuary.

City of Ventura Litter Management Program BMPs

- Installation of required Full Capture Catch Basin Trash Excluders completed in October 2014 to achieve 100% point-source compliance.
 - Installation of certified Stormtek Full Capture Catch Basin Trash Excluder Devices (CPS Devices) to achieve 100% reduction of trash from Baseline WLA, for all of the MS4 areas within the City of Ventura that drain to the Ventura River estuary.
- Street Sweeping
 - Residential Streets swept at least once a month.
 - Commercial Streets swept two to four times per month.
 - Information encouraging residents/businesses to move parked cars for sweeping.
- Catch Basin Inlet-Cleaning and Placarding
 - City-maintained catch basin inlets are inspected and cleaned of trash and debris one to three times per year depending on the priority categorization of the catch basin.
 - Information encouraging residents/businesses to report trash filled inlets.
 - “Don’t Dump – Drains to Oceans – Only Rain Down the Drain” stencils or placards placed on storm drain inlets.
- Trash Collection in Public Areas
 - The City installed 3 new ‘bear proof’ trash containers along the bike path directly adjacent to the river to promote the proper disposal of refuse, and prevent the spread of litter by providing locked, secure containers.
 - Trash and recycling containers are installed at all transit shelters and maintained at least once per week to remove litter and to verify that containers are functioning properly.
 - Special event permit language requires additional trash and recycling containers to be set out during street fairs and art walks, along with litter clean-up following events.
 - Collection of trash from 18 public trash receptacles located within the watershed two or three times per week depending on the locations of the receptacles.
- Trash Collection and Bulky Item Pickup
 - Residents and businesses are provided with trash and recycling collection services.
 - Residential customers are allowed to set out two “bulky items” for free collection once per year as part of their regular trash collection service.

- Inspection, Planning and Enforcement Support
 - The City identifies and requires corrective measures for litter or litter sources found during commercial, industrial, and construction site inspections.
 - New development and redevelopment projects are required to install trash enclosures with doors and covers to reduce litter.
 - The Ventura Police Department conducts periodic “enforcement sweeps” through the portion of the Estuary that is adjacent to the City limits.
 - Litter laws that prohibit the accumulation of trash on private property are enforced by the City Code Enforcement and County Environmental Health Department. Private properties are required to remove all trash from their premises at least once every seven days.
- Outreach
 - Litter prevention outreach is included in classroom presentations and stormwater pollution prevention advertisements/announcements.
 - Several half-hour TV programs produced by the City encourage residents to prevent litter.
- Partners in Progress
 - Citywide volunteer program with a mission to preserve Ventura’s natural environment by minimizing litter in water bodies and coastal areas.
- City-Initiated Clean-Up Events
 - The City will initiate clean-up events, as necessary, in response to observed elevated trash levels.
- City-Sponsored Clean-Up Events
 - The City sponsors various clean-up events throughout the City that may include one or more of the following events during any given year: Martin Luther King Day; Earth Day Beach Clean-Up; Coastal Clean-Up Day; Backyard Collective; and Ventura Charter School Trash-a-thon.
 - The City sponsored Westside Clean-Up (September 24, 2016) provided free disposal of solid waste from any west side (adjacent to the Ventura River) Ventura residents. Residents brought solid waste to a centralized location where it was sorted for recycling or disposal.
 - An additional clean up event was conducted by the City, in partnership with California Lutheran University. Incoming students cleared arundo to improve visibility and deter transient encampments. During the process they also removed litter that was lodged in the plant debris.
- Work Plan to Eliminate Homeless Encampments (Safe and Clean Program)
 - The Ventura City Council initiated the development of a work plan in September 2012 to eliminate encampments in the Estuary and to implement an on-going enforcement program. The work plan includes organizing stakeholder partners, conducting civil engagement, developing an action plan and corresponding follow-up steps, posting camps, conducting camp removal, and launching post-camp removal strategies.

County of Ventura and VCWPD Litter Management Program BMPs

- 100% Point-Source Compliance. Installation of required Full Capture Catch Basin Trash Excluders completed in October 2014. Installation of certified Stormtek Full Capture Catch Basin Trash Excluder Devices (CPS Devices) to achieve 100% reduction of trash from Baseline WLA, for all Ventura County Unincorporated areas draining to the County's MS4 within the Ventura River Estuary subwatershed. The County's Certification Report with installation details was provided in the 2013-2014 Annual Report.
- Development and Implementation of Connector Pipe Screen Trash Excluders Operation and Maintenance Plan (O&M Plan) – Developed an O&M Plan including schedule for regular maintenance and reporting of debris/trash removed for the 15 installed CPS devices. Training provided to maintenance staff in both the classroom and field to ensure proper cleanout and reporting methods and procedures.
- Regular Maintenance and Reporting 15 CPS Devices – Per the Connector Pipe Screen Trash Excluders O&M Plan, County staff inspect and perform necessary maintenance of each catch basin with CPS devices installed a minimum of three times per fiscal year: (1) One inspection before wet season, (2) one inspection during the wet season and (3) one inspection after the wet season. Debris depth is recorded and all debris is removed. Volume and type of debris is recorded and documented.
- Catch Basin Cleaning – Catch basins are inspected at least once per year and cleaned when filled to 25% or more of the catch basin's capacity. During storm season, all drainage facilities are inspected and cleaned as necessary.
- Catch Basin Labeling – All County catch basins are labeled with "Don't Pollute, Flows to Waterways."
- Open Channel Storm Drain Maintenance – All VCWPD owned and maintained channels are cleared, inspected, and cleaned as required at least once per year.
- Trash Management at Public Events – A plan for the proper management of trash and litter is required when obtaining a permit for staging public events. This plan requires adequate facilities for trash collection and disposal.
- Trash Collection in Public Areas – Trash receptacles have been placed within high trash generation areas. These devices are cleaned and maintained regularly to prevent trash overflow.
- Ventura County Ordinance No. 4142 – County ordinance (Section 6923 "Litter" and Section 6955 "Watercourse Protection") prohibit the disposal and accumulation of trash in public areas, private driveways, parking areas, streets, alleys, sidewalks, or components of the storm drain or any watercourse.
- Inspections – The County conducts commercial, industrial, and construction facility/site inspections to ensure proper pollution prevention BMPs are being applied and to educate employees on the importance of pollution prevention.
- Anti-Littering Signage – The County has installed anti-dumping and anti-littering signage at key locations including high trash generating areas, as well as at known illegal dumping locations.

- Foster Park Trash Management – The County manages Foster Park, which is situated along the Ventura River upstream of the Estuary, to ensure that trash originating from the park does not enter the river and deposit in the Estuary. Management actions include:
 - Park host and rangers removing trash and enforcing litter ordinance
 - Increased enforcement and collection during high trash generating events (holidays)
 - Covered trash containers and frequent trash pick-up and removal
 - Continued evaluation of trash management practices to determine whether current practices are sufficient
 - Continued evaluation of existing litter-related signage to determine whether current signage is adequate
- Happy Valley Bioswale was designed and constructed in spring of 2016 to capture runoff from 40% or 37 acres of urban area of County unincorporated Meiners Oaks community for removal of trash, debris, and other stormwater pollutants. This project treats estimated 1.6M cubic feet of the average annual runoff discharging into Happy Valley Drain, a tributary to Ventura River. This project was funded in parts by the Proposition 84 Storm Water Implementation Grant, Round 2. Project photos are provided in Appendix 3.
- Watershed Friendly Gardens – In Fall 2016, the County sponsored a series of five, free, open to the public, Watershed Friendly Garden Hands-On-Workshops in Meiners Oaks focusing on how to construct your own Watershed Friendly Garden, designed to help prevent stormwater pollutants, including trash, from entering the storm drains, creeks and rivers. The class culminated with construction of a Watershed Friendly Garden at Meiners Oaks Elementary School. Summary and photos are provided in Appendix 4.
- Countywide Outreach – The County and VCWPD continue to participate in the Countywide Outreach Program retaining the services of The Agency, a professional advertisement group that designs and conducts countywide, bilingual outreach programs advocating proper trash disposal. The most recent addition to the outreach program is trash prevention and protection of storm water quality education using Facebook®, Twitter® and other forms of social media. Examples of outreach materials are provided in Appendix 5.
- Targeted Outreach – The County conducts targeted outreach to schools within the area covered by the Trash TMDL to educate students, staff, and faculty on the importance of pollution prevention specifically regarding trash.

Caltrans Litter Management Program BMPs

- Ventura River Estuary – State Highway 33, between Post Mile 0.0 and 5.55, has litter removed approximately twice per month and is mechanically swept approximately once per month, as needed. This highway is also open to 'Adopt-A-Highway' groups and there are groups who currently have adoptions and perform litter removal twice per month.

Additional Trash Management Plans/BMPs in place for Caltrans:

- Caltrans currently uses a variety of methods to educate the public about the importance of managing stormwater. These are intended to change public behavior regarding the release of potential pollutants (e.g., litter, spilled loads, and oil leaks).
 - The outreach program consists of a variety of written materials, monthly and quarterly bulletins, websites, workshops, and Caltrans's Adopt-a-Highway Program, as described below.
- Caltrans installs "No Dumping" and "Litter Fine" signs at selected locations on highways and freeways. Stenciled warnings prohibiting discharges to drain inlets at state-owned park-and-ride lots, rest areas, vista points, and other areas with pedestrian traffic are also used to increase public awareness.
- Litter and debris removal activities include sweeping of shoulders, paved medians, etc., and litter removal along the roadsides.
- Caltrans uses venues such as public schools, community-sponsored clean-up events, Bring Your Child to Work Day, and Earth Day to educate the public about the importance of excluding pollutants from stormwater.
- Caltrans's Adopt-A-Highway program is an opportunity for volunteers to make a tangible contribution to community and roadside aesthetics, and acts as a way to inform the public about the stormwater problems related to illegal dumping of litter and debris. As part of this program, signs are posted along roadways acknowledging groups that have volunteered to plant wildflowers, trees and/or shrubs, collect litter, or remove graffiti from structures.
- In the metropolitan portions of Los Angeles, San Diego, Orange, and Ventura Counties, storm drain inlets are inspected and cleaned annually prior to the rainy season. Those storm drain inlets that contain 12 inches or more of accumulated material will be cleaned.
- Litter and debris are periodically collected from Caltrans's rights-of-way and removed from drainage grates, trash racks, and ditch lines. Maintenance supervisors inspect highways in their assigned sections for the accumulation of litter. Signs may be installed where litter accumulation is a concern.
- "Protect Every Drop" is a statewide Caltrans education and outreach pollution reduction public program that has been conducted since March 2016. The program uses public service announcements through various media such as television and radio broadcasts, billboards, newspapers, public outreach events, banners, posters, tip cards etc., and focuses on behavior changes. The program encourages the public to learn more about sources and pathways of stormwater pollution and teaches motorists what to do to reduce pollutants like trash. For more information, please refer to website www.protecteverydrop.com.
- Caltrans has in construction seven (7) Gross Solids Removal Devices – Inclined Screen Box in Route 33 which will be estimated to be completed on March 19, 2018. Four (4) Bioswales were planned on Route 33 and Route 101 which were proposed to begin construction on September 30, 2018.

In addition to local anti-litter ordinances, Caltrans relies on Sections 23112, 23113, 23114, and 23115 of the Vehicle Code as legal authority to prevent spills, dumping or disposal of materials on the highways and freeways under its jurisdiction, as enforced by the California Highway Patrol.

- Section 23112 states:

No person shall throw or deposit, nor shall the registered owner or the driver, if such owner is not then present in the vehicle, aid or abet in the throwing or depositing upon any highway any bottle, can, garbage, glass, nail, offal, paper, wire, any substance likely to injure or damage traffic using the highway, or any noisome, nauseous, or offensive matter of any kind.

No person shall place, deposit, or dump, or cause to be placed, deposited, or dumped, any rocks, refuse, garbage, or dirt in or upon any highway, including any portion of the right-of-way thereof, without the consent of the state or local agency having jurisdiction over the highway.

- Section 23113 states:

Any person who drops, dumps, deposits, places or throws, or causes or permits to be dropped, dumped, deposited, placed or thrown, upon any highway or street any material described in Section 23112 or in subdivision (d) of Section 23114 shall immediately remove the material or cause the material to be removed.

If the person fails to comply with subdivision (a), the governmental agency responsible for the maintenance of the street or highway on which the material has been deposited may remove the material and collect, by civil action, if necessary, the actual cost of the removal operation in addition to any other damages authorized by law from the person made responsible under subdivision (a).

- Section 23114 states (in pertinent part):

No vehicle shall be driven or moved on any highway unless the vehicle is so constructed, covered, or loaded as to prevent any of its contents or load other than clear water or feathers from live birds from dropping, sifting, leaking, blowing, spilling, or otherwise escaping from the vehicle.

- Section 23115 of the Vehicle Code states (in pertinent part):

No vehicle loaded with garbage, swill, cans, bottles, waste papers, ashes, refuse, trash, or rubbish, or any other noisome, nauseous, or offensive matter, or anything being transported to a dump site for disposal shall be driven or moved upon any highway unless the load is totally covered in a manner which will prevent the load or any part of the load from spilling or falling from the vehicle.

Ventura County Fairgrounds Litter Management BMPs

Ventura County Fair's BP for Litter Maintenance Non-Fair Time

Description of Action	Daily	Weekly	Monthly	Annually	Before Event	During Event	After Event	As Needed
Litter pickup Main Parking Lot	X					X	X	X
Litter pickup Beach Lot		X			X	X	X	X
Overflow Lot		X				X	X	X
Area Around Event		X			X	X	X	X
Trash Cans emptied	X					X	X	X
Recycle bins emptied		X						X
40 Yard dens emptied		X						X
Straw and Hay Removal								X
Power Sweep			X					X
Storm Drain Maintenance				October				X
Wash Rack Maintenance				June & Aug				X

Ventura County Fair's BP for Litter Maintenance Fair Time

Description of Action	Daily	Weekly	Monthly	Annually	Before Event	During Event	After Event	As Needed
Litter pickup Main Parking Lot	X				X	X	X	X
Litter pickup Beach Lot	X				X	X	X	X
Overflow Lot	X				X	X	X	X
Area Around Event (Harbor to Calif., Promenade and Beach, Garden St. to Main St. and surrounding area).	X				X	X	X	X
Trash Cans emptied	X				X	X	X	X
Recycle bins emptied	X				X	X	X	X
40 Yard dens emptied	X				X	X	X	X
Straw and Hay Removal	X				X	X	X	X
Power Sweep	X				X	X	X	X
Storm Drain Maintenance				Storm Drain Diverted to Sewer during Fair July- August				
Wash Rack Maintenance				June & Aug.				

California Department of Parks and Recreation (State Parks) BMPs

- Designated Public Use Areas
 - Trash containers are installed at all visitor activity areas. Containers are kept in good working order and are emptied as needed.
 - State Parks keeps one mixed use 40 yard roll-off container onsite to collect and dispose of approximately 20,000 lbs. of trash annually.
 - Park personnel and camp hosts routinely collect loose trash within developed park areas as a part of their daily duties. In addition, park personnel conduct weekly sweeps to identify, and remove trash accumulation in vegetated areas along the established trail system east of the campground.
- Undeveloped Areas
 - Litter and debris is periodically collected from park backcountry lands, water courses, and roadways. Maintenance supervisors inspect park roads in their assigned sections for the accumulation of litter.
 - Signs may be installed where litter concentration is repetitive and at known illegal dumping locations.
 - Catch basins are inspected and cleaned at least once per year. During storm season, drainage facilities are inspected before significant storm events.
- Volunteer Events and Public Outreach
 - State Parks sponsors various Earth Day and Coastal Cleanup events throughout the district and participates in special cleanup events to address observed elevated trash levels.
 - Routine and random river bottom patrols are conducted by law enforcement at a minimum of once per week to discourage establishment of illegal camp sites.
 - Camper outreach and education is implemented year-round in an effort to limit trash dispersal by wind and wildlife.
- Construction Projects and Special Events
 - All special events permits issued on State Park property require a plan for the proper management of trash. This plan requires adequate facilities and patrols for trash collection and disposal.
 - All contractors that work on State property are required to implement BMPs to keep job site clean and litter free.

VCAILG Litter Management Program BMPs

- Conditional Waiver – The *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region* (“Conditional Waiver,” Order No. R4-2016-0143) requires VCAILG to provide educational classes focused on improving water quality, including identifying trash as an impairment of water quality.
- VCAILG members are required to maintain trash control BMPs for agricultural areas. In a BMP survey completed in 2015, VCAILG members in the Ventura River watershed reported a 99% adoption rate for trash control BMPs, an 18% increase since 2010. In its role, VCAILG will continue to assist members with implementation of additional BMPs for trash control, as necessary, following the adaptive process identified in the group’s Water Quality Management Plan (WQMP).
- Outreach – During VCAILG outreach activities, the Trash TMDL is highlighted and a connection made for the need to control trash in order to meet the requirements of the Trash TMDL.
- Ventura River Trash TMDL Fee – VCAILG members are assessed a fee, based on acreage farmed, to further reinforce through a fiscal measure that trash in the watershed needs addressing.
- Plastics Recycling – Local farmers will recycle agricultural plastic used to cover strawberry beds and used in some vegetable fields during the growing season. Collection and recycling of plastic is an effective method for reducing plastic trash from entering the Ventura River and the Estuary.
- Taylor Ranch (Wood-Claeyssens Foundation), a VCAILG member with property beginning immediately upstream of the Ventura River Main Street bridge, is an active participant in the Trash TMDL program by regularly cleaning and patrolling their property. Through the efforts of the Wood-Claeyssens Foundation, it is estimated that approximately 55 tons of trash were removed from the Taylor Ranch Ventura River bottom from transient/homeless camps through March 2012. Since that time, 5 to 10 more tons has been collected annually. In 2016, it is estimated that 9.5 tons were removed and disposed of properly. Taylor Ranch continues to be successful in maintaining the cleanliness of the property and protecting water quality by employing the following practices:
 - Regular monitoring and patrolling of the area adjacent to the river was increased to an average of every two weeks in 2016 to intercept homeless camps more quickly and prevent the cycle of trash accumulation.
 - As camps are discovered, clean-up is initiated as soon as possible in order to convey the message that the area is being actively monitored. Law enforcement assistance is requested, as needed.

- Both the Ventura Police Department and the Ventura County Sheriff's Department have responded in the past with Rangers from the California State Parks systems also helping with this effort.

MFAC/BMP Program Evaluation and Revision Recommendations

The TMRP states the responsible parties will: "Evaluate effectiveness of BMPs and recommended changes to TMRP Addendum No. 1 and MFAC/BMP Program, as necessary." Under the previous MFAC/BMP Program and TMRP, the following steps were used to assess MFAC/ BMP Program effectiveness:

1. A review of BMP implementation, including identification of BMPs, location of BMPs, and time frame (*e.g.*, when an activity was implemented or installed); and
2. A comparison of monitoring results between monitoring locations and between events before and after BMP implementation.
3. Comprehensive review and assessment of MFAC/BMP Program

Given the broad nature of most of the BMPs implemented (*e.g.*, education programs, ordinances, street sweeping), the highly variable amounts of trash collected, and the relatively short time frame that full capture devices were installed, the responsible parties could not identify trends in the monitoring data that could be used to determine effectiveness of individual BMPs implemented. Based on the results of the previous evaluation and the structure of the new MFAC/BMP Program, the responsible parties utilized an approach based on the visual assessments.

The responsible parties utilized parcel rankings by Category as a means to assess effectiveness of the MFAC/BMP Program. That is, if there was an overall trend of parcels starting out and remaining in Category 1, or parcels moving from Category 2 or Category 3 to Category 1, then no modifications to the MFAC/BMP Program are needed. Conversely, if there was an overall trend of parcels moving from Category 1 to Category 2 or Category 3 over the course of the implementation year, then modifications to the MFAC/BMP Program would be considered.

2013-14 was the first year of the revised TMRP and modified MFAC/BMP Program implementation. A large amount of legacy trash existed in the Ventura River Estuary and the bulk of the effort (including many additional clean-up events) during this monitoring year has gone towards cleaning up the legacy trash. While most of the parcels have been cleaned and legacy trash removed, the State Parks Parcel (MFAC Area 2) still contains legacy trash. This is due to a population of homeless individuals that are not receptive to relocating from the area, even after multiple citations from local law enforcement. Once the legacy trash is removed, the revised TMRP and MFAC/BMP Program will begin to be implemented at the frequency outlined in the TMRP (without the additional clean-ups).

As a result, the responsible parties are not conducting an assessment of the program or proposing any revisions to the MFAC/BMP Program during this annual report. The focus on removing remaining legacy trash in the Estuary during the monitoring year does not allow for development of an assessment of the baseline MFAC/BMP Program this year. Once the legacy trash is removed and the MFAC/BMP Program has been implemented without the legacy trash, the

responsible parties will have a clearer understanding of the effectiveness of the baseline MFAC/BMP Program. However, through the initial implementation of the revised MFAC/BMP Program, it is clear that the revised MFAC/BMP Program is a better use of resources and much more effective at removing trash from the Estuary compared to the previous MFAC/BMP Program. The responsible parties will provide any revisions that were made or will be made to the MFAC/BMP Program, in the fourth-year Annual Report, which will be submitted in January 2018.

Appendix 1. Assessment and Collection Worksheets

Appendix B – MFAC Event Worksheet

MFAC Event Worksheet

Parcel No.: _____ Event Date: Oct 3 2015
 Specific Cleanup Location: Willoughby Preserve Event Start/ End Time: 0900 / 1200
 Field Technician name(s): Derek Powlitney
 Current Weather Condition: Sunny, 80°
 Antecedent Weather Condition: Sunny, clear

Types of Trash Observed (check all that apply):

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> Plastic/ Styrofoam | <input checked="" type="checkbox"/> Paper Products/ Biodegradable | <input checked="" type="checkbox"/> Household Items |
| <input checked="" type="checkbox"/> Landscape Materials | <input checked="" type="checkbox"/> Aluminum/ Metal | <input type="checkbox"/> Automotive |
| <input checked="" type="checkbox"/> Toxic/ Hazardous Materials | <input checked="" type="checkbox"/> Glass | <input checked="" type="checkbox"/> Biohazardous |
| <input checked="" type="checkbox"/> Personal Effects | <input checked="" type="checkbox"/> Sports Equipment | <input checked="" type="checkbox"/> Other |

Notes: Area cleaned up consisted of the area between the Main Street Bridge & the Union Pacific Bridge. Project included rehabilitating an area just North of the Union Pacific Bridge previously used as a encampment where a large amount of trash was removed and the campsite was buried in arundo clippings.

Potential Source(s) of Trash Collected: Homeless camps, party spots

Hazardous/ Legacy Trash Requiring Follow-up: None on VHC land however the State Park land along the Ventura River West bank has numerous large piles of trash & human waste

MFAC Event Actions for Follow-up: Camp area just North of the railroad bridge has been picked clean of trash however additional work should be done covering the site up with arundo clippings to discourage further camping

Additional Notes: _____

Trash Collected: _____
 No. of Trash Bags Filled: 26 Dumpster % Fill: N/A Dumpster Size (cubic yds): N/A

Lead Field Technician Certification (sign/ print):

"Cleaned area is free of all visible trash." - Flemming Bertelsen / Flemming Bertelsen

Appendix B – MFAC Event Worksheet

MFAC Event Worksheet

Parcel No.: 3 and Main Street Bridge Event Date: 4/16/16
 Specific Cleanup Location: Willoughby Property Event Start/ End Time: 9:00 / 12:00
 Field Technician name(s): Jessica Nikolai, Derek Poultney
 Current Weather Condition: Sunny
 Antecedent Weather Condition: Sunny

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/ Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials	Aluminum/ Metal	Automotive
Toxic/ Hazardous Materials <input checked="" type="checkbox"/>	Glass <input checked="" type="checkbox"/>	Biohazardous <input checked="" type="checkbox"/>
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment	Other

Notes: One large tent with personal effects, 1 twin sized mattress, blankets, towels, some explicit reading materials and drug paraphernalia.

Potential Source(s) of Trash Collected: Illegal campers and/or parties.

Hazardous/ Legacy Trash Requiring Follow-up: None in the immediate location – more camps to be removed under the Main Street bridge in the near future.

MFAC Event Actions for Follow-up: City to clean up camps under the Main Street after police have removed the illegal campers. State Parks and City property still have numerous camps.

Additional Notes: State Parks vehicle removed collected trash and disposed of in State Park dumpster.

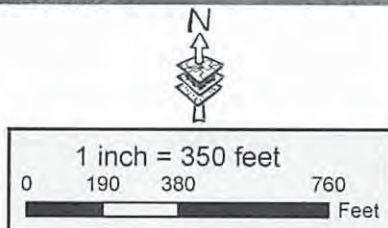
Trash Collected: No. of Trash Bags Filled: 27 Dumpster % Fill: 100% Dumpster Size (cubic yds): 9

Lead Field Technician Certification (sign/print):

"Cleaned area is free of all visible trash." - Jessica Nikolai



Legend	
	Parcels
	Ventura River Trash TMDL Subwatershed
	TMDL Defined Estuary
	Adjacent Properties



Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

DISCLAIMER:
The information combined hereon was created by the County of Ventura Geographic Information System (GIS) data which is operated for the convenience of the County. The County of Watershed Protection District makes no representation or warranty of this map, based on County GIS data, is accurate and that it contains no errors or omissions; and asserts that no economic or physical reliance should be placed on the County data or on any conclusions generated from County GIS data contained hereon.

4/16/16

Appendix B – MFAC Event Worksheet

MFAC Event Worksheet

Parcel No.: 3 Event Date: 5/21/16
 Specific Cleanup Location: Willoughby / Main St. Event Start/ End Time: 9:00 / 12:00
 Field Technician name(s): Jessica Nikolai, Adrienne Stephens
 Current Weather Condition: Sunny
 Antecedent Weather Condition: Sunny

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/ Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials <input type="checkbox"/>	Aluminum/ Metal <input type="checkbox"/>	Automotive <input checked="" type="checkbox"/>
Toxic/ Hazardous Materials <input checked="" type="checkbox"/>	Glass <input checked="" type="checkbox"/>	Biohazardous <input checked="" type="checkbox"/>
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment <input checked="" type="checkbox"/>	Other <input type="checkbox"/>

Notes: Plastic/paper bags and product packaging, clothing, food, bottles full of urine, buckets with fecal matter, car keys, an unloaded gun, glass bottles, bicycles, law motor and battery, and one large BBQ.

Potential Source(s) of Trash Collected: Homeless encampments, disrespectful visitors, parties/graffiti artists, traffic from the Main Street bridge, wind blown trash from elsewhere.

Hazardous/ Legacy Trash Requiring Follow-up: Continued efforts needed under other sections of the Main Street bridge.

MFAC Event Actions for Follow-up: Continued monitoring of bridges/ areas in which tents can easily hide.

Additional Notes: Car keys and gun discovered were handed over to State Park law enforcement. State Parks was instrumental in removing bagged trash in their truck from the property. Bikes were also given to law enforcement with the CA State Parks.

Trash Collected:
 No. of Trash Bags Filled: 35 Dumpster % Fill: 25% Dumpster Size (cubic yds): 40

Lead Field Technician Certification (sign/print):

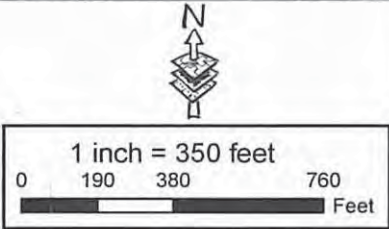
"Cleaned area is free of all visible trash." -

Jessica Nikolai



Legend

- Parcels
- Ventura River Trash TMDL Subwatershed
- TMDL Defined Estuary
- Adjacent Properties



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5/21/16

Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

Appendix B – MFAC Event Worksheet

MFAC Event Worksheet

Parcel No.: 23 Event Date: 6/18/16
 Specific Cleanup Location: Willoughby State Park Event Start/ End Time: 9:00 / 11:00
 Field Technician name(s): Jessica Nikola, Derek Paulthey
 Current Weather Condition: Sunny, warm
 Antecedent Weather Condition: -same-

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/ Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials <input type="checkbox"/>	Aluminum/ Metal <input checked="" type="checkbox"/>	Automotive <input type="checkbox"/>
Toxic/ Hazardous Materials <input checked="" type="checkbox"/>	Glass <input checked="" type="checkbox"/>	Biohazardous <input checked="" type="checkbox"/>
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment <input checked="" type="checkbox"/>	Other <input type="checkbox"/>

Notes: Batteries, old food wrappers, urine bottles, rugs, pillows, hand tools, knives, bikes/ bike parts, cardboard, plastic bags, clothes, luggage case, shopping carts, plastic/ glass/ aluminum spray cans, cigarette butts.

Potential Source(s) of Trash Collected: Homeless individuals and parties - some possibly blown in from the freeway/roads.

Hazardous/ Legacy Trash Requiring Follow-up: wooden structure under the 101 freeway to be dismantled at some point.

MFAC Event Actions for Follow-up: Increase patrols/ notifying law enforcement.

Additional Notes: Port-a-potty has shown up along bike path near trail entrance to Willoughby - may increase activity in the river bottom.

Trash Collected: No. of Trash Bags Filled: 32 Dumpster % Full: 23% Dumpster Size (cubic yds): 40

Lead Field Technician Certification (sign/print):

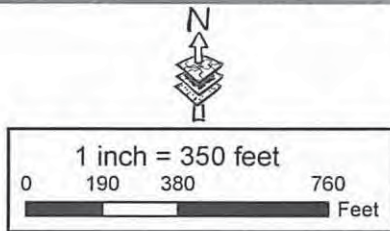
"Cleaned area is free of all visible trash." -

Jessica Nikola



Legend

- Parcels
- Ventura River Trash TMDL Subwatershed
- TMDL Defined Estuary
- Adjacent Properties



Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

DISCLAIMER:
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6/8/16

Appendix B – MFAC Event Worksheet

MFAC Event Worksheet

Parcel No.: 2, 3 Event Date: 7/16/16
 Specific Cleanup Location: VHC, State Park, Main Street Bridge Event Start/ End Time: 9:00 12:00
 Field Technician name(s): J. Nikolai, D. Parthay, A. Stephens
 Current Weather Condition: cloudy
 Antecedent Weather Condition: Sunny

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/ Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials	Aluminum/ Metal	Automotive
Toxic/ Hazardous Materials	Glass <input checked="" type="checkbox"/>	Biohazardous <input checked="" type="checkbox"/>
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment	Other

Notes: Good amount of plastic bags and plastic wrappers/
packaging, tarps, clothing, electronics, paper and paper
packaging, mattress, old food, blankets, fecal matter.

Potential Source(s) of Trash Collected: Homeless individuals, disrespectful
day users, blown in from nearby roads

Hazardous/ Legacy Trash Requiring Follow-up: One large trash "pit" is
still present near the State Park island, as well as a
large trash pile and homeless encampment (wooden fort)
under the 101 freeway and old camp trash on city prop.

MFAC Event Actions for Follow-up: Contact State Parks and
CALTrans to notify / assist in removal of trash

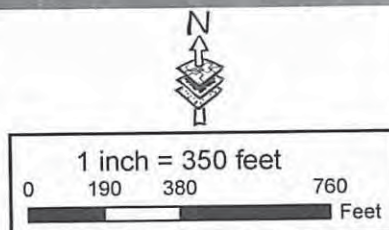
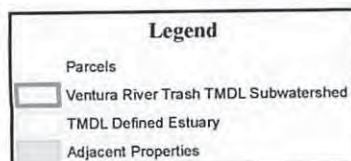
Additional Notes: State Park truck removed / hauled away
trash to their dumpsters.

Trash Collected:
 No. of Trash Bags Filled: ~28 Dumpster % Fill: 19% Dumpster Size (cubic yds): 40

Lead Field Technician Certification (sign/ print):

"Cleaned area is free of all visible trash." -

Jenica Nikolai



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7/16/16

Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

Appendix B – MFAC Event Worksheet

MFAC Event Worksheet

Parcel No.: 1,3 Event Date: 8/20/16
 Specific Cleanup Location: City of Ventura, VHC Event Start/ End Time: 9:00 / 1:00
 Field Technician name(s): J. Nikolai
 Current Weather Condition: partly cloudy, cool
 Antecedent Weather Condition: Sunny, warm

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/ Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials <input type="checkbox"/>	Aluminum/ Metal <input checked="" type="checkbox"/>	Automotive <input checked="" type="checkbox"/>
Toxic/ Hazardous Materials <input checked="" type="checkbox"/>	Glass <input checked="" type="checkbox"/>	Biohazardous <input checked="" type="checkbox"/>
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment <input checked="" type="checkbox"/>	Other <input type="checkbox"/>

Notes: Batteries, clothing, old food, toys, plastic/paper trash,
feminine products, tape, rugs, boogie boards, blankets,
Feces/urine, pillows, buckets, sundries, wooden pallet.

Potential Source(s) of Trash Collected: Illegal camping, general
homeless individual activities.

Hazardous/ Legacy Trash Requiring Follow-up: One rug that was nailed
down to a group of trees remains - volunteer offered to
return later in the week to collect with a hammer.
A large piece of upholstery remains on VHC property along trail.

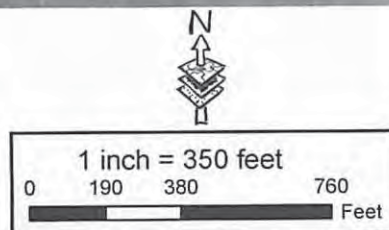
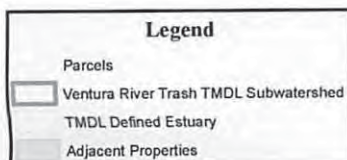
MFAC Event Actions for Follow-up: Increase in patrols on City property
to ensure it remains clear for upcoming CLV event.

Additional Notes: CLV (Cal Lutheran) arando-removal event on
Monday, Aug 29th on City property. Trash was removed
to create space for students to work. State Park truck removed/
hauled away trash to their dumpsters.

Trash Collected:
 No. of Trash Bags Filled: 32 Dumpster % Fill: 23% Dumpster Size (cubic yds): 40

Lead Field Technician Certification (sign/print):

"Cleared area is free of all visible trash." - Jessie Nikolai



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8/20/16

Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

Appendix B – MFAC Event Worksheet

MFAC Event Worksheet

Parcel No.: 2,3,4 Event Date: 9/17/16
 Specific Cleanup Location: State Park, VHK, County Event Start/ End Time: 9:00 / 12:00
 Field Technician name(s): J. Nikolic, D. Dunkell
 Current Weather Condition: Sunny
 Antecedent Weather Condition: Sunny

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/ Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials <input type="checkbox"/>	Aluminum/ Metal <input checked="" type="checkbox"/>	Automotive <input checked="" type="checkbox"/>
Toxic/ Hazardous Materials <input checked="" type="checkbox"/>	Glass <input checked="" type="checkbox"/>	Biohazardous <input checked="" type="checkbox"/>
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment <input checked="" type="checkbox"/>	Other <input type="checkbox"/>

Notes: Tarps, clothing, pillows, bedding, plastic/paper trash, cans/
bottles, baby chis, furniture, cardboard, old food, books, needles,
bags, batteries.

Potential Source(s) of Trash Collected: Illegal camping and/or trash
blown in from 101 freeway and Arroyo Street bridge.

Hazardous/ Legacy Trash Requiring Follow-up: Wooden "fort" (homeless
encampment) still under the 101. Some trash remains
in large trash pit on state property.

MFAC Event Actions for Follow-up: Increase in patrols into more
dense, woody areas.

Additional Notes: State Park truck removed/hauled away
trash to their dumpsters. United way "Day of Caring" event -
(6 volunteers (also Coastal Cleanup Day).

Trash Collected: ~42 Dumpster % Full: 35% Dumpster Size (cubic yds): 40

Lead Field Technician Certification (sign/print):
 "Cleaned area is free of all visible trash." - Jenica Nikolic



APN: 060-0-320-195
Wood-Claessens Foundation
105.12 Acres

APN: 071-0-120-110
City of San Buenaventura
9.78 Acres

APN: 060-0-320-050
Ventura County Flood Control District (WPD)
7.85 Acres

APN: 060-0-320-283
Ventura Beach RV Resort Inc.
18.56 Acres

APN: 060-0-320-065
Ventura Hillside Conservancy
8.74 Acres

APN: 060-0-320-215
State of California
Dept. of Parks & Recreation
33.87 Acres

APN: 060-0-320-075
State of California
Dept. of Parks & Recreation
48.44 Acres

APN: 060-0-320-225
State of California
Dept. of Parks & Recreation
21.44 Acres

APN: 060-0-320-090
City of San Buenaventura
19.66 Acres

APN: 073-0-231-010
31st District Agricultural Association
(Ventura County Fair)
11.48 Acres

Legend

- Parcels
- Ventura River Trash TMDL Subwatershed
- TMDL Defined Estuary
- Adjacent Properties

N
↑

1 inch = 350 feet

0 190 380 760 Feet

**Ventura River
Trash TMDL
Estuary Subwatershed
Area
(as defined by TMDL)**

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9/17/16

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3, 4 Survey Date: 10/9/15
 Inspector: Flemming Bertelsen Survey Start/ End Time: 1530 / 1730
 Current Weather Condition: Sunny, hot
 Antecedent Weather Condition: Sunny

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
1- Trash pile	3	New pile at new camp
2- shoe collection	1	personal items
3- shelter	2	built with planks & arundo
4- blankets	1	used as privacy screens/blinds
5- trash pile	3	camp trash
6- trash pile	3	camp trash
7- bike parts	2	camp site
8- sleeping bag	1	camp/personal trash
9- graffiti trash	1	paint can
10- lawn chair	1	camp item
11- large trash pile	3	camp trash
12- old camp	3	personal items

Types of Trash Observed (check all that apply):

- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> Plastic/ Styrofoam | <input checked="" type="checkbox"/> Paper Products/Biodegradable | <input checked="" type="checkbox"/> Household Items |
| <input checked="" type="checkbox"/> Landscape Materials | <input checked="" type="checkbox"/> Aluminum/ Metal | <input type="checkbox"/> Automotive |
| <input checked="" type="checkbox"/> Toxic/ Hazardous Materials | <input checked="" type="checkbox"/> Glass | <input checked="" type="checkbox"/> Biohazardous |
| <input checked="" type="checkbox"/> Personal Effects | <input checked="" type="checkbox"/> Sports Equipment | <input type="checkbox"/> Other |

Notes: _____

Est. No. of Follow-up Cleanup Events Needed (describe why):

campers are migrating off the preserve and onto State Parks land west of the River.

Additional Notes:

Island & Preserve are clear of major trash

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: _____ Survey Date: 11/30/15
 Inspector: Derek Pahlitzky & Jess Nikolai Survey Start/ End Time: 1:30/2:30
 Current Weather Condition: Sunny, warm
 Antecedent Weather Condition: Sunny, warm

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① Main street Bridge	2	Scattered trash
② 101 Bridge	2	" "
③ Throughout St. Paul's prop.	1	" "

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/Biodegradable <input checked="" type="checkbox"/>	Household Items
Landscape Materials	Aluminum/ Metal	Automotive
Toxic/ Hazardous Materials <input checked="" type="checkbox"/>	Glass	Biohazardous
Personal Effects	Sports Equipment	Other

Notes: Batteries, spray paint cans

Est. No. of Follow-up Cleanup Events Needed (describe why): More trash clean up throughout patrols.

Additional Notes: Quick patrol - mostly trash observed throughout properties.

APN: 060-0-320-284
Ventura Beach RV Resort Inc.
18.56 Acres

APN: 060-0-320-065
Ventura Hillside Conservancy
8.74 Acres

APN: 060-0-320-215
State of California
Dept. of Parks & Recreation
35.87 Acres

APN: 060-0-320-075
State of California
Dept. of Parks & Recreation
18.34 Acres

APN: 060-0-320-225
State of California
Dept. of Parks & Recreation
21.44 Acres

APN: 060-0-320-090
City of San Buenaventura
19.66 Acres

APN: 073-0-231-010
31st District Agricultural Association
(Ventura County Fair)
11.48 Acres

Legend

11/30/15



Ventura River
Trash TMDL

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3, 4 Survey Date: 12/28/15
 Inspector: Jessica Nikolai, Stephen Byrne Survey Start/ End Time: 1:00 / 3:00
 Current Weather Condition: Sunny, cool
 Antecedent Weather Condition: - same -

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① 4 - Near Main St. Bridge	2	1 tent in ditch near bridge
② 4 - Under shrubs at drainage	2	Old trash pile; clothing, paper/plastics
③ Under Main St. Bridge	3	Living structure
④ Under 101 freeway	3	Large trash pile
⑤ 2 - West of river	2	Encampment left over
⑥ 2 - West of river	2	Old trash pile - scattered
⑦ 2 - West of river	2	Scattered bike parts/ shopping cart
⑧ 2 - Emma Wood	2	Scattered trash/bike parts
⑨ 2 - Emma Wood	3	HUGE trash pile
⑩ 2 - Emma wood	2	Scattered trash
⑪ 2 - Cypress grove	3	Encampment
⑫ 2 - Crossing to island	2	Large trash pile
⑬ 2 - Island	2	1 tent + 2 car batteries

Types of Trash Observed (check all that apply):

☒ Plastic/ Styrofoam ☒ Paper Products/Biodegradable ☒ Household Items
☒ Landscape Materials ☒ Aluminum/ Metal ☒ Automotive
☒ Toxic/ Hazardous Materials ☒ Glass ☒ Biohazardous
☒ Personal Effects ☒ Sports Equipment ☒ Other - Many rusty bike parts

Notes: Many bike parts observed this patrol - a few semi-active sites in/around Emma wood.

Est. No. of Follow-up Cleanup Events Needed (describe why): Emma Wood definitely need some help! Also various spots along the river bottom on state park prop. need clean up - maybe 2 or 3 clean ups to knock these locations (including Emma wood) out.

Additional Notes: State Parks has done A LOT of work opening up the Emma wood River trail - many tents/trash observed in this area from recent patrols is now gone. Osprey hanging out on light pole above 101, black skimmer seen at beach near river mouth. River no longer connected to ocean.

12/28/15



Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3 Survey Date: 1/14/16
 Inspector: J. Nikolai, D. Poultray Survey Start/ End Time: 3:30/ 5:00
 Current Weather Condition: red, sunny
 Antecedent Weather Condition: cool, dark

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① Main Street Bridge	3	Tent and garbage - camp
② Main Street Bridge	3	Tent and garbage - camp
③ Main Street Bridge	3	Tent and garbage - camp
④ State Park - 2	2	Scattered garbage
⑤ State Park - 2	3	Tent and garbage
⑥ State Park "Island" - 2	3	Multiple tents - camp
⑦ City - 1	2	Scattered trash
⑧ City - 1	2	Scattered trash
⑨ State Park - 2	2	Scattered trash

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam ☒
 Landscape Materials
 Toxic/ Hazardous Materials
 Personal Effects ☒

Paper Products/Biodegradable ☒
 Aluminum/ Metal
 Glass
 Sports Equipment

Household Items ☒
 Automotive
 Biohazardous
 Other

Notes: _____

Est. No. of Follow-up Cleanup Events Needed (describe why): Authorities will
notify squatters that they will need to leave and
take their things.

Additional Notes: Jerry Foreman of Ventura Police and Gina
Lynch of CA State Park Law Enforcement were notified
of camps. Spoke with a few folks near the island
and on the island - warned them that authorities would
be coming.



APN: 060-0-320-284
Ventura Beach RV Resort, Inc.
18.56 Acres

APN: 060-0-320-065
Ventura Hillside Conservancy
8.74 Acres

APN: 060-0-320-215
State of California
Dept. of Parks & Recreation
35.87 Acres

APN: 060-0-320-075
State of California
Dept. of Parks & Recreation
18.34 Acres

APN: 060-0-320-225
State of California
Dept. of Parks & Recreation
21.44 Acres

APN: 060-0-320-090
City of San Buenaventura
19.66 Acres

APN: 073-0-231-010
31st District Agricultural Association
(Ventura County Fair)
11.48 Acres

Legend



1/14/16

Ventura River
Trash TMDL

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3, 4 Survey Date: 2/26/16
 Inspector: J. Nikolic, Andre Gasnave, John Lemo Survey Start/ End Time: 2:30 / 4:00
 Current Weather Condition: Sunny, breeze with a chill
 Antecedent Weather Condition: Sunny, some clouds coming in from ocean

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① Main St. Bridge	3	Large camp - persons now gone, leftover garbage/belongings
② Main St. Bridge	2	Sleeping bag w/ some belongings
③ State Parks - 2	3	Living structure
④ State Parks - 2	2	Leftover trash from tent
⑤ State Parks - 2	2	Misc. trash scattered
⑥ City - 1	3	Tent w/ many belongings
⑦ City - 1	2	Possible living/resting area
⑧ City - 1	2	Trash pile
⑨ State Park "Cypress Grove"	3	New tent along trail
⑩ State Park "Cypress Grove"	3	New tent, semi hidden
⑪ State Park "Cypress Grove"	3	Large trash pile, some in bags

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam ☒ Paper Products/Biodegradable ☒ Household Items ☒
 Landscape Materials ☐ Aluminum/ Metal ☒ Automotive ☐
 Toxic/ Hazardous Materials ☐ Glass ☒ Biohazardous ☒
 Personal Effects ☒ Sports Equipment ☐ Other ☐

Notes: Still misc. scattered trash under Main St. and 101 Freeway bridges.

Est. No. of Follow-up Cleanup Events Needed (describe why): One to two - mostly scattered trash throughout properties as well as the now accessible garbage under the Main St. Bridge.

Additional Notes: Island inaccessible today. State Park law enforcement, John Luchich, accompanied us on the east side of the river - not city property. Persons that had been under the Main St. Bridge were arrested Thurs morning (2/25).



Legend



2/26/16

Ventura River
Tuck TMD

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3, 4 Survey Date: 3/9/16
 Inspector: S. Nikola, Maria Villalobos, Bill Murphy Survey Start/ End Time: 11:00 11:00
 Current Weather Condition: Sunny, breezy
 Antecedent Weather Condition: Sunny, breezy

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① City-1	2	Trash pile
② City-1	2	Two collapsed tents + personal items
③ City-1	1	Blankets on path
④ Willoughby, VHC-3	2	Sheets strung up w/ aranda + personal items
⑤ Willoughby, VHC-3	3	Large tent + personal items + hung up clothes
⑥ Willoughby, VHC-3	2	Living structure (from last week) in poison oak
⑦ Willoughby, VHC-3	2	Trash pile
⑧ Willoughby, VHC-3	2	Trash pile
⑨ Main St. Bridge	3	Trash pile (from old camp)
⑩ Main St. Bridge	2	Trash pile (from old camp)
⑪ 101 Freeway	2	Active encampment - 1 tent + personal items
⑫ Main St. Bridge	2	Trash pile

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam ☒ Paper Products/Biodegradable ☒ Household Items ☒
 Landscape Materials ☐ Aluminum/ Metal ☐ Automotive ☐
 Toxic/ Hazardous Materials ☐ Glass ☒ Biohazardous ☐
 Personal Effects ☒ Sports Equipment ☐ Other ☐

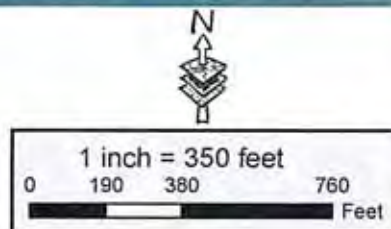
Notes: Many living structures present - only (5) and (11)
Seemed active, others seem recent but not really in
use (rain from yesterday possibly deterred camping).

Est. No. of Follow-up Cleanup Events Needed (describe why): 1 or 2 good
clean ups required in Willoughby old camps and current
camps that will need to be evicted).

Additional Notes: Trash pile from now abandoned camp under
Main Street bridge appears to be dwindling in size - other
persons taking items from this location? City police to be
contacted for current camps.



Legend	
	Parcels
	Ventura River Trash TMDL Subwatershed
	TMDL Defined Estuary
	Adjacent Properties



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3/9/16

Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3 Survey Date: 4/14/16
 Inspector: J. Nikolai & Ken Merideth Survey Start/ End Time: 3:30 / 4:30
 Current Weather Condition: Sunny, breeze
 Antecedent Weather Condition: Sunny, windy

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① Main Street Bridge	3	Tent + personal belongings
② Main Street Bridge	3	Tents + personal belongings
③ I-5 freeway	3	4 tents + personal belongings
④ City -1	3	Tents + personal belongings
⑤ City -1	2	Misc. items
⑥ City -1	2	Misc. trash
⑦ City -1	1	Two garbage bags full of items
⑧ City -1	2	Small living area
⑨ City -1	2	Old fire pit / camp site
⑩ State Park -2	2	Small living area
⑪ State Park -2	2	Scattered trash pile
⑫ State Park -2	2	Small trash pile

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials	Aluminum/ Metal <input checked="" type="checkbox"/>	Automotive
Toxic/ Hazardous Materials	Glass <input checked="" type="checkbox"/>	Biohazardous
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment	Other

Notes: _____

Est. No. of Follow-up Cleanup Events Needed (describe why): 2-3; tents need to be removed, lots of misc. trash throughout properties.

Additional Notes: VHC volunteer cleanup coming up, 4/16. Willoughby tent and nearby trash to be removed.

13	State Park - 2	2	Scattered trash
14	State Park - 2	2	Plastic bag with spilled trash
15	State Park - 2	2	Plastic bag w/ trash
16	Willoughby - VHC - 3	2	Trash pile
17	Willoughby - VHC - 3	1	Blankets
18	Willoughby - VHC - 3	3	Tent w/ many personal belongings
19	Willoughby - VHC - 3	2	Trash piles
20	Willoughby - VHC - 3	2	Trash pile



Legend



4/4/16

Ventura River
Tuck TMD

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3 Survey Date: 5/5/16
 Inspector: J. Nikolaj, Jill Foreman Survey Start/ End Time: 1:00 / 3:00
 Current Weather Condition: cloudy / cool
 Antecedent Weather Condition: sunny / warm

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① Main Street bridge	1	clothing / misc. items
② Main Street bridge	3	Almost every trestle has misc. trash
③ Willoughby - 3	1	Plastic bags / misc. trash
④ Willoughby - 3	1	Clothing
⑤ Willoughby - 3	2	Tent w/ personal items
⑥ Willoughby - 3	2	Living structure w/ personal items
⑦ 101 Freeway	2	large pile of misc. items
⑧ 101 Freeway	2	Tent w/ personal items
⑨ State Parks - 2	2	Scattered trash on trail
⑩ State Parks - 2	2	Personal items
⑪ State Parks - 2	1	Bike laying next to trail
⑫ City - 1	2	Bike parts behind an arundo wall

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam	Paper Products/Biodegradable	Household Items
Landscape Materials	Aluminum/ Metal	Automotive
Toxic/ Hazardous Materials	Glass	Biohazardous
Personal Effects	Sports Equipment	Other

Notes: Could not get a good look at items on "the island" (site 10).

Est. No. of Follow-up Cleanup Events Needed (describe why): 2-3 +; new tents and remains of old encampments. Lots of misc. trash scattered around. Some trash observed in river near the island as well.

Additional Notes: County vehicle parked near Main St. bridge - one employee w/ two girls testing water quality of river.

⑬ City - 1

3

Multiple tents + personal items

⑭ City - 1

2

Opened trash bags w/ trash

⑮ City - 1

2

Living structure w/ personal items

⑯ City - 1

2

Misc. personal items - possible living structure

⑰ State Parks - 2

1

Misc. trash

⑱ State Parks - 2

1

Trash, sleeping bags, misc. items

⑲ Willoughby - 3

2

Scattered misc. trash



Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3, 4 Survey Date: 6/2/16
 Inspector: J. Nikolaj Chris Penheart Survey Start/ End Time: 2:00 / 3:30
 Current Weather Condition: cloudy
 Antecedent Weather Condition: Sunny to partly cloudy

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① County - 4	2	Trash in drainage ditch
② VHC - 3	2	Misc. trash, shopping cart
③ Main Street bridge	2	Misc. trash
④ VHC - 3	2	Tent w/ misc. items
⑤ VHC - 3	2	Luggage, clothing, trash, books
⑥ VHC - 3	2	wooden pallet, misc. trash
⑦ VHC - 3	3	Tent w/ misc. items
⑧ VHC - 3	1	Sleeping bag + trash
⑨ VHC - 3	2	Sleeping bag + trash
⑩ IOL Freeway	3	Misc. trash under trestles
⑪ IOL Freeway	3	Tents + many personal items
⑫ State Park - 2	3	Trash pile

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam ✓	Paper Products/Biodegradable ✓	Household Items ✓
Landscape Materials	Aluminum/ Metal ✓	Automotive
Toxic/ Hazardous Materials ✓	Glass ✓	Biohazardous ✓
Personal Effects ✓	Sports Equipment	Other

Notes: Lots of "leftover" trash, biohazardous waste,
and scattered garbage throughout properties.

Est. No. of Follow-up Cleanup Events Needed (describe why): 3-4; deblowing
more and more trash! Efforts needed on all properties.

Additional Notes: Site (7) on VHC to be cleared by police
tomorrow - will inform them of a new tent (4) that
has popped up in a location where a tent was recently
removed.

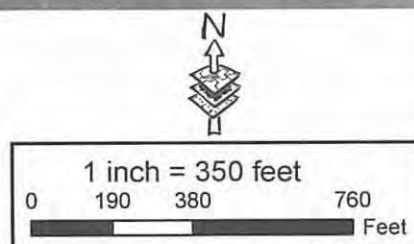
(13) State Park-2	2
(14) State Park-2	2
(15) State Park-2	1
(16) State Park-2	2
(17) City-1	3
(18) City-1	2
(19) City-1	3
(20) City-1	2
(21) City-1	1
(22) State Parks-2	3
(23) State Parks-2	3
(24) State Parks-2	2
(25) State Parks-2	2
(26) State Parks-2	2
(27) State Parks-2	3
(28) VHC-3	2
(29) VHC-3	2

Tent + personal items
 Mix. trash all along trail
 few pieces of trash visible on island
 Misc trash all along trail
 Trash leftover from camps
 Old firepit w/ misc trash
 Tent + many items
 3 full trash bags
 sleeping bag + a few items
 Leftover trash from camps
 leftover trash from camp
 Tin cans, other metal pieces
 Plastics + misc trash
 Paper products + misc. trash
 Tent + items
 Trash pile
 few pieces of scattered trash



Legend

- Parcels
- Ventura River Trash TMDL Subwatershed
- TMDL Defined Estuary
- Adjacent Properties



Ventura River Trash TMDL Estuary Subwatershed Area

DISCLAIMER:
The information combined hereon was created by the County of

6/2/16

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3 Survey Date: 7/13/16
 Inspector: J. Nikolic, Russell Richardson Survey Start/ End Time: 1:00 / 2:30
 Current Weather Condition: Sunny
 Antecedent Weather Condition: Sunny

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① VHC-3	2	Trash can lid, bicycle parts, trash
② VHC-3	1	Bicycles, trash
③ Main Street bridge	2	Under most central freestyles - misc. trash
④ VHC-3	1	Few pieces of trash
⑤ VHC-3	2	Plastic wrappers along trail
⑥ VHC-3	2	Remains of a camp - mostly paper
⑦ VHC-3	2	Plastic bags, trash, toilet paper
⑧ VHC-3	1	Misc. trash on trail
⑨ VHC-3	1	Clothing, plastics
⑩ VHC-3	1	Plastic bags w/ trash
⑪ 101 Freeway	3	Living structure + sheets, chairs
⑫ 101 Freeway	1	Tarp + trash

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam <input checked="" type="checkbox"/>	Paper Products/Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials <input type="checkbox"/>	Aluminum/ Metal <input checked="" type="checkbox"/>	Automotive <input type="checkbox"/>
Toxic/ Hazardous Materials <input type="checkbox"/>	Glass <input type="checkbox"/>	Biohazardous <input checked="" type="checkbox"/>
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment <input type="checkbox"/>	Other <input type="checkbox"/>

Notes: Lots of plastics, clothing, bike parts.

Est. No. of Follow-up Cleanup Events Needed (describe why): 3-4; trails need to be walked to remove scattered trash throughout properties.

Additional Notes: One individual seen in camp, ⑨, during patrol. Camp that was on VHC property, ⑥, now gone. Still many camps/ camp trash in City and State properties - lots of trash along VHC trails.

- (13) 101 Freeway
- (14) State Parks - 2
- (15) State Parks - 2
- (16) Train trestle
- (17) City - 1
- (18) City - 1
- (19) City - 1
- (20) City - 1
- (21) State Parks - 2

3
2
2
3
3
3
3
3
1

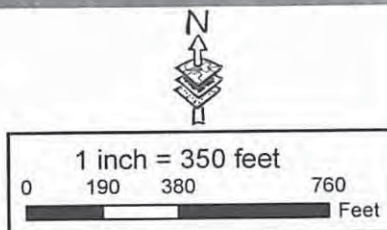
Leftover trash from encampment
Mattress + trash, tarp
Trash along trail to island
Mix. trash, clothing under bridge
Lots of old camp trash
Large, full trash bags

Encampment

Old encampment trash, possible active site
Tape? across trail in trees above trail



Legend	
Parcels	
Ventura River Trash TMDL Subwatershed	
TMDL Defined Estuary	
Adjacent Properties	



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7/13/16

Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3 Survey Date: 8/15/16
 Inspector: J. Nikolai, B. Richardson Survey Start/ End Time: 1:30 / 3:00
 Current Weather Condition: Sunny, breezy
 Antecedent Weather Condition: sunny

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① Main Street bridge	1	Clothing, trash
② Main Street bridge	1	Trash, cardboard
③ Main Street bridge	1	Multiple spray paint cans
④ VHC-3	1	Trash, clothing
⑤ VHC-3	2	Few trash spots hidden in shrubs
⑥ VHC-3	1	Pieces of wood
⑦ 101	1	Small trash pile
⑧ State Parks -2	3	Large trash pile
⑨ 101	3	Old camp-trash
⑩ State Parks -2	2	Clothing trash, beach toys
⑪ State Parks -2	3	Campsite - dismantling
⑫ State Parks -2	1	Paper/plastic trash

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam ☒

Landscape Materials ☒

Toxic/ Hazardous Materials ☒

Personal Effects ☒

Paper Products/Biodegradable ☒

Aluminum/ Metal ☒

Glass ☒

Sports Equipment ☒

Household Items ☒

Automotive ☒

Biohazardous ☒

Other ☐

Notes: Lots of clothing, paper and plastic trash - old campsites.

Est. No. of Follow-up Cleanup Events Needed (describe why): 3-4; cleanup to occur this week (August 20th) on city property.

Additional Notes: ⑪ Campsite was in the process of being dismantled by inhabitants during patrol (it appeared).

⑬ Train trestle	2
⑭ State Parks-2	1
⑮ City-1	3
⑯ City-1	3
⑰ City-1	2
⑱ City-1	2
⑲ State Parks-2	2
⑳ State Parks-2	3
㉑ State Parks-2	1
㉒ 101	3
㉓ 101	3
㉔ VHC-3	1

Trash under each trestle

Starbucks umbrella

Old campsite trash - many spots here

Old campsite trash

Trash bags w/ trash

Old campsite trash

Old campsite trash - many spots here

Active camp

Plastic trash on trail

Old campsite trash - blankets, plastic bottles

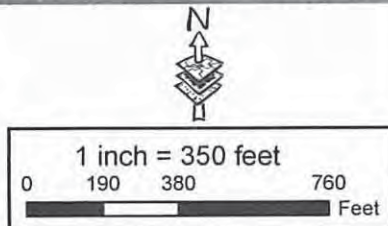
Wooden fort

Trash on trail



Legend

- Parcels
- Ventura River Trash TMDL Subwatershed
- TMDL Defined Estuary
- Adjacent Properties



Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

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8/15/16

Appendix A – Trash Visual Survey Worksheet

Trash Visual Survey Worksheet

Parcel No.: 1, 2, 3, 4 Survey Date: 9/13/16
 Inspector: J. Nikolaj, John Harrison Survey Start/ End Time: 1:00 1:15
 Current Weather Condition: Sunny, cool
 Antecedent Weather Condition: Sunny

Level of Trash Observed:

Refer to Program Monitoring Area Map as necessary. Note any categorical variation in levels of trash observed in different areas of the parcel. If necessary, categorize these areas individually.

KEY: Category 1 (<10 pcs), Category 2 (10-100 pcs), Category 3 (>100 pcs)

Notes/ Parcel Area:	Category:	Reason(s) for Category Rating:
① County - 4	3	Old campsite
② County - 4	2	Clothing, paper trash
③ Main Street bridge	2	Plastic trash, bottles
④ VHC - 3	2	Old clothing, trash
⑤ VHC - 3	1	Old cushion or mattress
⑥ VHC - 3	2	Small camp - clothing, sleeping pad, bucket
⑦ State Park - 2	3	Clothing trash
⑧ 101 Freeway	3	Toilet paper, clothing, paper/plastics
⑨ 101 Freeway	2	Tarp, clothing, blankets
⑩ State Parks - 2	2	Small tent, personal effects
⑪ State Parks - 2	1	Clothing, boots, trash
⑫ State Parks - 2	3	Large trash pit
⑬ State Parks - 2	1	Suitcase w/ clothing
⑭ State Parks - 2	1	Starbucks umbrella & stand, Caltrans hat

Types of Trash Observed (check all that apply):

Plastic/ Styrofoam	Paper Products/Biodegradable <input checked="" type="checkbox"/>	Household Items <input checked="" type="checkbox"/>
Landscape Materials	Aluminum/ Metal <input checked="" type="checkbox"/>	Automotive
Toxic/ Hazardous Materials	Glass <input checked="" type="checkbox"/>	Biohazardous <input checked="" type="checkbox"/>
Personal Effects <input checked="" type="checkbox"/>	Sports Equipment <input checked="" type="checkbox"/>	Other

Notes: Still lots of clothing, plastic/paper trash.

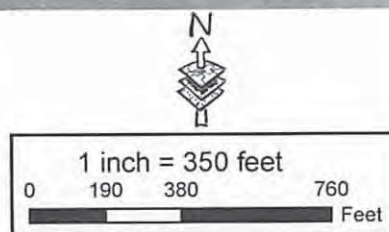
Est. No. of Follow-up Cleanup Events Needed (describe why): With enough volunteers, 1 to 2 cleanups. Cleanup upcoming on 9/17.

Additional Notes: Heard what sounded like tools being used around ⑫.

(13) State Parks - 2	1	Metal stand
(14) State Parks - 2	1	Clothing, trash
(15) Railroad bridge	2	Trash, cooler, clothing
(16) Railroad bridge	2	Plastic trash
(17) Railroad bridge	2	Couch cushions, trash
(18) City - 1	1	Plastic trash
(19) City - 1	2	Tent
(20) City - 1	2	Full garbage bags
(21) City - 1	2	Old campsite
(22) City - 1	2	Old camp trash
(23) City - 1	2	Full garbage bags
(24) State Parks - 2	2	Medium pile of trash
(25) State Parks - 2	1	Bicycles
(26) I-10 Freeway	2	Old campsite
(27) I-10 Freeway	3	Wooden fort...



Legend	
	Parcels
	Ventura River Trash TMDL Subwatershed
	TMDL Defined Estuary
	Adjacent Properties



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9/13/16

Ventura River Trash TMDL Estuary Subwatershed Area (as defined by TMDL)

Appendix 2. Clean-Up Photos

Ventura Hillside Conservancy Clean Up Photos



October 5, 2015- United Way volunteers cleaning up under the 101 freeway.



October 5, 2015- Executive Director, Derek Poultney, lends a hand.



April 16, 2016- A small but mighty group of volunteers!



April 16, 2016- A camp in Willoughby Preserve “before”.



April 16, 2016- “After” of camp in Willoughby Preserve.



May 21, 2016- Removing a BBQ from Willoughby Preserve.



May 21, 2016- A large haul from Willoughby Preserve.



May 21, 2016- State Park employees picking up the haul to kindly transport to their dumpsters.



June 18, 2016- A “before” camp under a large elderberry.



June 18, 2016- “After” cleaning up the camp.



June 18, 2016- Scattered trash in between 101 and RV Park property.



June 18, 2016- "Before" camp in Willoughby Preserve.



June 18, 2016- "During" camp removal in Willoughby Preserve.



August 20, 2016- "Before" camp on City property near the bike path.



August 20, 2016- “After” camp on City property near the bike path.



August 20, 2016- Another large haul, this time from City property and part of State Park.



August 20, 2016- “Before” camp on City property near the river.



August 20, 2016- “After” camp near the river.



August 20, 2016- Another “before” camp on City property near the river.



August 20, 2016- “After” camp near the river.



September 17, 2016- Clearing out a large “trash pit” on State Park property. This pit required a few more visits until it was completely free of trash.



September 17, 2016- United Way volunteers at it again, this time on County property.

Appendix 3. Happy Valley Bioswale in Meiners Oaks, CA

Happy Valley Bioswale

Urban Low Impact Development (LID) Retrofit South Lomita Ave, Meiners Oaks, CA



Facing East From Lomita Avenue
At OVLC Property's Existing
Walking Path Near Northern Tip of
OVLC Property



Facing South From on Lomita Avenue
From Northern Tip Of OVLC Property



Facing East From Lomita Avenue Looking At Existing Catch Basin At Southern Rip Of OVLC Property



Facing South From On Lomita Avenue Approaching Southern Tip Of OVLC Property



Contractor mobilization and start of grading



Graded swale and OVLC
maintenance crossing



OVLC maintenance crossing



OVLC maintenance crossing





Concrete and forms for diversion catch basin and transition structure



Diversion catch basin and inlet local depression concrete work



Excavation for treatment vault



Treatment vault placement



Constructing concrete headwall
for swale discharge piping



Concrete headwall for
swale discharge piping



Baffle box vault
placement





Constructing concrete headwall for swale inlet piping from baffle box



Constructing concrete headwall for swale inlet piping from baffle box



Excavated area for maintenance vehicle parking (out of traffic)



Maintenance vehicle parking area (out of traffic)

Installed Irrigation System

7



Completed Outlet



Completed Swale

8



Completed Swale

9





Drone picture before construction



Drone picture after construction

Happy Valley Bioswale – Educational Signs

August 2016

11



Appendix 4. County's Watershed Friendly Garden Program in Meiners Oaks, CA

WATERSHED FRIENDLY GARDEN PROGRAM AT MEINERS OAKS ELEMENTARY SCHOOL

September 10, 2016 through October 22, 2016

Ventura County Public Works Agency's Watershed Protection District
Ojai Unified School District & Meiners Oaks Elementary School

Surfrider Foundation & Green Gardens Group (G3)

G3 Instructors: Kathy Nolan, ASLA; John Tikotsky, ASLA;
Laura Bauer, Natasha Elliott, and Jan Bird

Dufau Landscaping, Inc.



**Surfrider
Foundation®**



Funding has been provided in full or in part through an agreement with the State Water Resources Control Board.



Watershed Friendly Garden Program

1st Seminar: **Get the Basics**
September 10, 2016

Instructor:
Kathy Nolan, Green Gardens Group

32 Participants at Meiners Oaks
Elementary School



Watershed Friendly Garden Program

2nd Seminar: **Evaluate the Site**
September 24, 2016

Instructor:
John Tikotsky, Green Gardens Group

30 Participants at Meiners Oaks Elementary School



Watershed Friendly Garden Program

3rd Seminar: Landscape Design
October 1, 2016

Instructor:
Kathy Nolan, Green Gardens Group

32 Participants at Meiners Oaks
Elementary School



Watershed Friendly Garden Program

4th Seminar: Lawn Be Gone
– Build Soil and Capture Rain
October 15, 2016

Instructor:

Laura Bauer, Green Garden Group

18 Participants at Meiners Oaks Elementary School



Watershed Friendly Garden Program

5th Seminar: Planting and Irrigation
October 22, 2016

Instructor:
John Tikotsky, Green Garden Group

23 Participants at Meiners Oaks Elementary School



**Meiners Oak Elementary School
Watershed Friendly Garden
Completion
October 24, 2016**



Watershed Friendly Garden at Meiners Oak Elementary School

September - October 2016

BEFORE



BEFORE



AFTER



AFTER



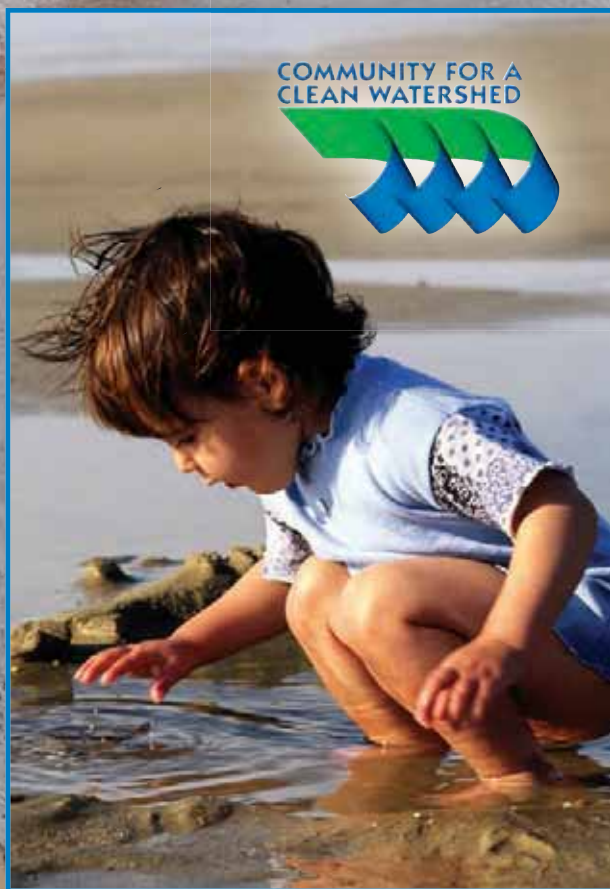
Appendix 5. Countywide Outreach Materials

GARBAGE IN GARBAGE OUT

Storm drains empty straight into
our rivers, lakes and beaches.

Unfiltered. Untreated.

Act responsibly with
your household trash,
pesticides, fertilizers,
grass clippings,
pet waste and
driveway fluids.



The watershed should
only shed water.
cleanwatershed.org

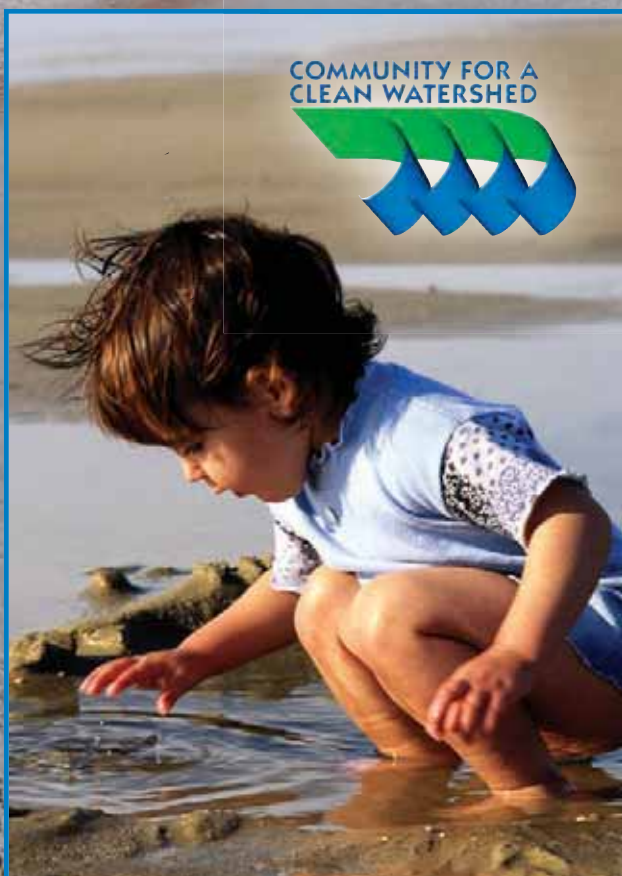
SI HECHAS BASURA SALE BASURA

Los sistemas de drenaje se vacían directamente a nuestros ríos, lagos y playas.

Sin filtración. Sin tratamiento.

Actúe responsablemente

con los desechos de su hogar, como pesticidas, fertilizantes, recortes de pasto, residuos de mascota y flúidos de carro.



La cuenca hidrográfica sólo debería transportar agua.

cleanwatershed.org

**THE WATERSHED
SHOULD ONLY
SHED WATER...**

NOT TRASH.

COMMUNITY FOR A
CLEAN WATERSHED



cleanwatershed.org

La Cuenca Hidrográfica Solamente Debería Transportar Agua...

No Basura.



COMMUNITY FOR A
CLEAN WATERSHED



cleanwatershed.org

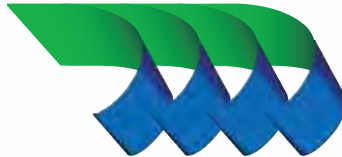


PICK IT UP

BEFORE IT MAKES THE TRIP.

THE WATERSHED SHOULD ONLY SHED WATER

COMMUNITY FOR A
CLEAN WATERSHED



www.cleanwatershed.org



RECOGELO ANTES DE QUE HAGA
EL VIAJE HACIA EL OCEANO.

**Nuestra Cuenca Hidrográfica Solo
Debe Transportar Agua**

COMMUNITY FOR A
CLEAN WATERSHED



www.cleanwatershed.org

Ventura River Watershed Boundary Signs



Ventura River Watershed “Keep It Clean” Signs

