



Monterey Bay Sanctuary Citizen Watershed Monitoring Network

99 Pacific Street BLDG 455A Monterey, CA 93940 (831) 647-4227

2019 MRSWMP Dry Run & First Flush Monitoring Report

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Prepared by:

Lisa Emanuelson, Volunteer Monitoring Coordinator
California Marine Sanctuary Foundation

Bridget Hoover, Water Quality Protection Program Director
Monterey Bay National Marine Sanctuary

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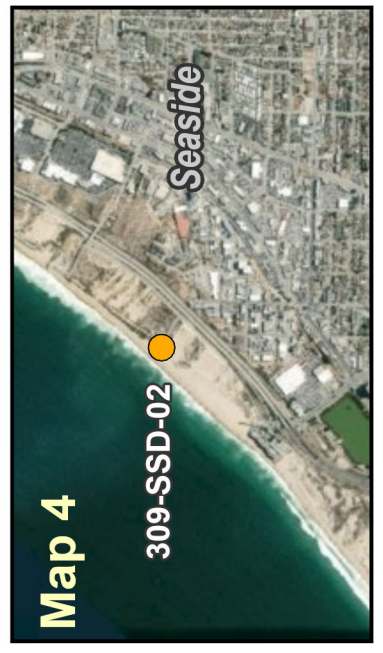
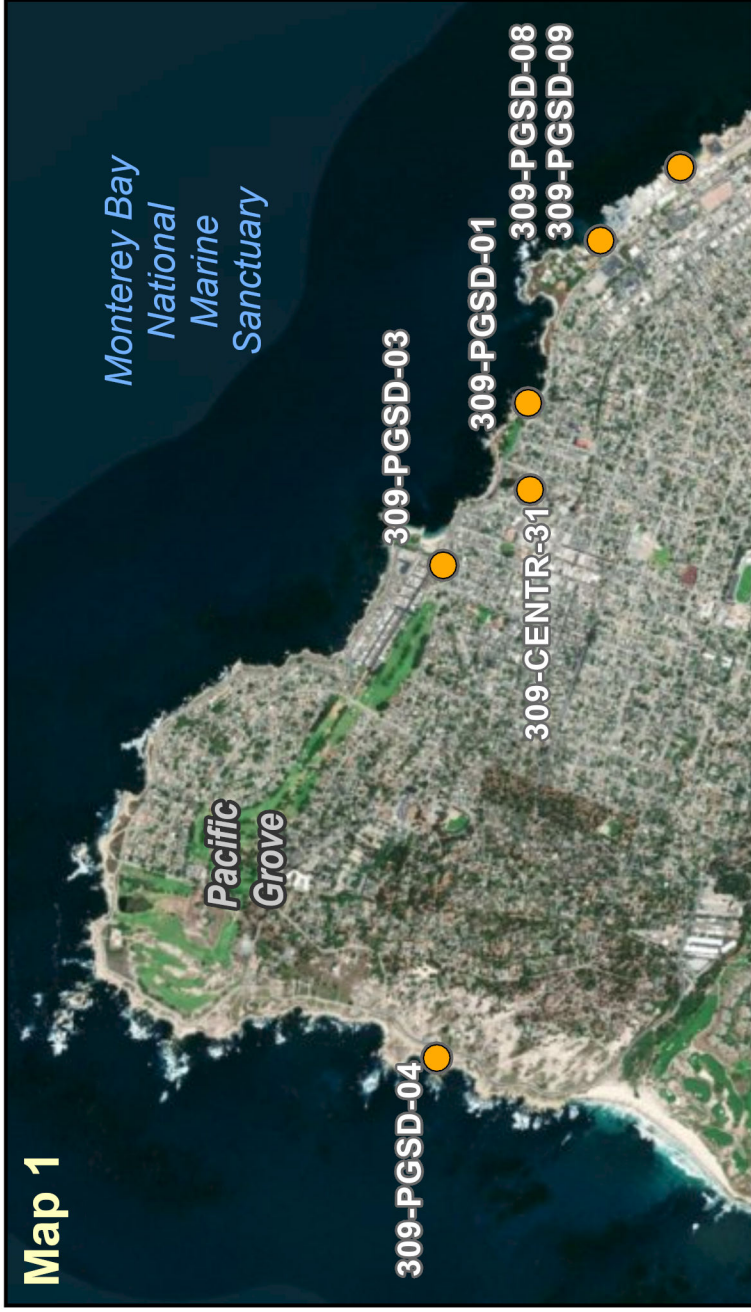
Monterey Regional Storm Water Management Program

MRSWMP Monitoring 2019

- MRSWMP Sites

Monterey Bay National Marine Sanctuary

Map 1 Pacific Grove
Map 2 Monterey
Map 3 Salinas
Map 4 Seaside
Map 5 Carmel



Introduction

The Monterey Regional Storm Water Management Program's (MRSWMP) water quality monitoring program is modeled after Monterey Bay National Marine Sanctuary's (MBNMS) Dry Run-First Flush monitoring program. Dry Run and First Flush volunteers collect water samples from storm drain outfalls prior to the first major rainstorm of the year (Dry Run) and during the first major rainstorm of the winter season (First Flush). Samples are analyzed for common urban pollutants such as detergents, bacteria, metals, sediments and nutrients.

Samples collected during dry weather prior to the first major rainstorm provide information about dry weather flows such as pollutant concentrations, amount of groundwater base flow, or contributions from urban sources such as car washing, pressure washing, irrigation or illicit discharges. Dry weather flows are an important component of water quality monitoring since contaminants can be less diluted and therefore more concentrated than those of wet weather flows. Water samples collected during the first major rainstorm of the winter season provide information on the concentration of contaminants in storm water after months of dry weather accumulation of pollutants on land in urban areas. All runoff from the Monterey region eventually flows into MBNMS except in areas where diversions have been installed that capture some dry and wet weather storm drain system flows and divert it to the sanitary sewer. Cities like Pacific Grove, Salinas and Carmel-by-the-Sea have constructed diversions which facilitate reuse of runoff while minimizing the amount of contaminants flowing to MBNMS. It is hoped that this data collected for the MRSWMP water quality monitoring program provides local cities with the information on where best to implement best management practices focused on improving water quality.

The MRSWMP water quality monitoring program promotes volunteer participation, stewardship and environmental education while providing important data regarding the quality of water flowing into MBNMS. This monitoring program is designed to meet E.8.ii requirements under the Phase II Storm Water Permit, satisfying public involvement and participation elements of the permit. This monitoring program does not fulfill the E.13 requirements pertaining to ASBS Monitoring, TMDL Monitoring, 303(d) Monitoring or Receiving Water Monitoring which are completed by permittees individually or through regional programs.

Methods

The same protocols and laboratory analyses are used for all of the MRSWMP water quality monitoring events. New Dry Run and First Flush volunteers attend a classroom training and participate in hands-on practice during the Dry Run: a half day event where volunteers demonstrate their skills, visit outfall sites, and collect water samples if flowing water is found. Volunteers are mobilized for the First Flush when at least 0.10 inches of rain has fallen, there is sheeting water on roadways and conductivity is at or below 1000 μS . During the Dry Run and First Flush, volunteers take field measurements (water temperature, pH, electrical conductivity and transparency) and collect water samples for lab analysis of nutrients (nitrate, orthophosphate, ammonia and urea), bacteria (*Eschericia coli* and enterococcus), metals (copper, lead and zinc), total suspended solids, color, Methylene Blue Active Substances (MBAS) detergents, hardness (as CaCO_3), potassium and

turbidity. Samples and field equipment are delivered immediately to the monitoring coordinator once sample collection is complete.

Dry Run monitoring entails collecting a single grab sample from each site with flowing water. During the First Flush, two sets of grab samples are collected 30 minutes apart for two time series. In this report, First Flush results reported by *analyte* are averaged between the two time series, and First Flush results reported by *jurisdiction* have individual time series results listed. Samples for urea are only collected during the first time series and are therefore not an average but a single sample result for each event.

During the First Flush, samples are collected from two receiving water sites to better understand dilution in the ocean compared to end of pipe results. Receiving water sample collection consists of collecting water at the point at which outfall flows reach the receiving water, in this case the ocean, where some mixing has occurred. This location is termed point zero. Samples for this receiving water sampling are collected at point zero as soon as feasible after the outfall samples are collected, in a separate bucket similar to what is used for outfall monitoring. Receiving water samples are tested for the same analytes as outfall samples.

The Cities of Carmel and Pacific Grove operate dry weather storm drain diversion systems for dry and some wet weather flows in the storm drain system. Water quality data from sites monitored above any dry weather diversions are still valuable as contaminants identified in the runoff did *not* flow to the ocean. Two sites in Carmel, 4th Avenue and Ocean Avenue, are within the city's diversion area where dry weather storm drain flows are retained and diverted into infiltration trenches; the City of Carmel's diversion is never on during the First Flush. Pacific Grove's diversion collects dry and wet weather storm drain flows and pumps them into the sanitary sewer. Sites within the City of Pacific Grove's diversion system boundaries are: HopkinsMon (Pacific Grove), HopkinsPG (Pacific Grove), 8th Street (Pacific Grove), Greenwood Park (Pacific Grove) and Lovers(Pacific Grove). When the City of Pacific Grove's diversion remains on during the First Flush, as it was this year, sites are still monitored as long as water is flowing from the outfall. This flow is overflow from within the system which could be a combination of flows from a number of adjacent watersheds. However, due to the severity of the storm and the large amount of precipitation for First Flush 2019, the diversion was not able to keep up with flow and all outfalls within the Pacific Grove diversion area had flow to the ocean. While most diverted sites are monitored at the outfall, 4th Avenue (Carmel) and Greenwood Park (Pacific Grove) are monitored above the connection point with the diversion system for the Dry Run and First Flush due to access issues at the outfalls. Lovers (Pacific Grove) is monitored above the connection point only for the First Flush due to safety issues at the outfall. Ocean Avenue is sampled at the outfall for both the Dry Run and First flush events due to inaccessibility upstream of the outfall.

Most results (lab and field) in this study are compared to receiving water standards established for beneficial uses in a stream, lake, or the ocean (see Table 1). These receiving water quality standards are not meant for end of pipe monitoring, such as for this MRSWMP water quality monitoring program, except for the analytes that refer to the MS4 General Permit. However, lacking standards for most end-of-pipe monitoring, receiving water standards are used for comparison. MBAS detergents and metal results are compared to the Water Quality Control Plan for the Central Coast Basin (Basin Plan) Water Quality Objectives (WQO) set by the Regional Water Quality Control Board

(RWQCB) for the protection of marine or aquatic life. Because there are no numerical water quality objectives in the Basin Plan for *E. coli*, enterococcus, nitrate, orthophosphate, and total suspended solids (TSS), those results are compared with the U.S. Environmental Protection Agency (U.S. EPA) WQOs or Central Coast Ambient Monitoring Program's (CCAMP) Action Levels. The U.S. EPA objectives are for the protection of human health while CCAMP's Action Levels are benchmarks that are set for receiving water concentrations at which pollutants may impact cold-water fish. Action Levels typically represent existing regulatory standards; levels derived from the literature or other agency references; or from data that shows levels are elevated relative to the data distribution for that parameter on the Central Coast. It is important to reiterate that both RWQCB Basin Plan Water Quality Objectives and CCAMP Action Levels are established for receiving waters and not for end of pipe discharges such as is collected for the MRSWMP monitoring. There are no end-of-pipe objectives for most of the monitored analytes of the MRSWMP monitoring program, however, the State Water Resources Control Board's (SWRCD) National Pollution Discharge and Elimination System (NPDES) MS4 General Permit does provide end-of-pipe water quality Action Levels for: ammonia, color, hardness, potassium, and turbidity. For turbidity, the SWRCB NPDES MS4 Action Levels have been supplanted by CCAMP Action Levels that are more protective of water quality.

Grab sample results are reported as concentration, consistent with how the water quality objectives are defined. However, this does not give an indication of the load of pollutants being discharged. To facilitate calculation of instantaneous load, instantaneous flow was measured by filling a container of known volume (a bucket), timing how fast the container filled, and estimating how much of the flow was captured while filling the container. Dry Run instantaneous flow calculations are from a single sample, while the First Flush instantaneous flow calculations are an average of two time series samples.



Figure 1. Volunteers at 4th Avenue (Carmel) for First Flush on November 26, 2019. Photo: A. Phillips.



Figure 2. Sudsy flow at 4th Avenue (Carmel) during the First Flush 2019. Photo: A. Phillips.



Figure 3. Colorful but shadowy figures collect outfall samples at HopkinsPG (top pipe) and HopkinsMon (lower pipe) during the First Flush 2019. Photo: C. Reed.

Table 1: Receiving Water Quality Objectives

| <u>Parameter (reporting units)</u> | <u>Water Quality Objectives</u> | <u>Source of Objective</u> |
|---|---|--|
| Ammonia (mg/L) | Not to exceed 50 | SWRCB NPDES MS4 General Permit |
| Color (color units) | Not to exceed 500 | SWRCB NPDES MS4 General Permit |
| Copper (µg/L) | Not to exceed 30 ¹ | Water Quality Control Plan for the Central Coast- RWQCB |
| <i>E. coli</i> (MPN/100ml) | Not to exceed 235 ² | U.S. EPA Ambient Water Quality Criteria |
| Enterococcus (MPN/100ml) | Not to exceed 104 | U.S. EPA Ambient Water Quality Criteria |
| Hardness as CaCO ₃ (mg/L) | Not less than or = to 10 or greater than or = to 2,000 | SWRCB NPDES MS4 General Permit |
| Lead (µg/L) | Not to exceed 30 ¹ | Water Quality Control Plan for the Central Coast- RWQCB |
| MBAS Detergents (mg/L) | Not to exceed 0.2 | Water Quality Control Plan for the Central Coast- RWQCB |
| Nitrate as N (mg/L) | Not to exceed 2.25 ³ | Central Coast Ambient Monitoring Program (CCAMP) |
| Orthophosphate as P (mg/L) | Not to exceed 0.12 ⁴ | Central Coast Ambient Monitoring Program (CCAMP) |
| pH (pH units) | Not < 6.5 or > 8.5 | Water Quality Control Plan for the Central Coast- RWQCB |
| Potassium (mg/L) | Not to exceed 20 | SWRCB NPDES MS4 General Permit |
| Total Suspended Solids (TSS) (mg/L) | Not to exceed 500 ⁵ | Central Coast Ambient Monitoring Program (CCAMP) |
| Transparency (cm) | Not less than 25 ⁶ | Central Coast Ambient Monitoring Program (CCAMP) |
| Turbidity (NTU) | Not to exceed 25 | Central Coast Ambient Monitoring Program (CCAMP) |
| Zinc (µg/L) | Not to exceed 200 ¹ | Water Quality Control Plan for the Central Coast- RWQCB |

Note: Urea is not listed because it does not have a Water Quality Objective or Action Level.

¹ Water Quality Control Plan for Central Coast Cold Water objective for hard water

² Environmental Protection Agency, Updated WQO.

³ Central Coast Ambient Monitoring Program, Pajaro River Watershed Characterization Report 1998, rev 2003.

⁴ Williamson, The Establishment of Nutrient Objectives, Sources, Impacts and Best Management Practices for the Pajaro River and Llagas Creek, 1994.

⁵ Central Coast Ambient Monitoring Program, Salinas River Watershed Characterization Report 1999, rev. 2000.

⁶ Based upon equivalent guideline value used for 303(d) Listing Guideline Value (Sigler et al., 1985)

Results

Two monitoring events took place during the 2019 MRSWMP permit year:

- The Dry Run was conducted on Saturday, September 21st, 2019 at 13 sites with the help of 30 volunteers. Lovers (Pacific Grove) was checked for flowing water on Saturday, September 21st but was sampled on Tuesday September 24th due to difficulties in accessing the end of the pipe at this site. Only 5 of the 14 sites had enough flowing water to be sampled for the Dry Run 2019.
- The First Flush was conducted on November 26th, 2019 at 13 sites with the help of 38 volunteers. Volunteers were mobilized at 9:30 pm when the front approached the Monterey Peninsula and dropped enough rain for sampling. On this evening 13 of the 14 outfall sites were sampled.

This year some peculiar events occurred during First Flush sampling:

- Due to safety issues from an exploded transformer at Boronda (Monterey County) on November 26th, this site was not sampled for the First Flush program. Monterey County staff sampled this site the following day and results from that sampling event were used for this report. However, not all of the First Flush analytes were analyzed by Monterey County. For those analytes that were not tested, a notation is included in the analyte descriptions.
- Receiving Water samples could not be collected on November 26th due to the time of night and severity of the storm. Receiving water samples were instead collected along with paired end of pipe samples during another storm on January 9th, 2020 starting at 9 am. Receiving water data in the following analyte graphs are accompanied by paired end of pipe results taken at the same time and labeled "Site ID-FF#2". All receiving water results are presented in Appendix 4.
- Two sites had only one set of samples collected: San Carlos (Monterey) and HopkinsMon (Monterey). At HopkinsMon (Monterey) the flow stopped prior to the collection of a second set of samples and at San Carlos (Monterey) the team forgot to collect a second set of samples and field measurements.

Flow was measured by volunteers at the time of sampling except at sites where low flow during the Dry Run prohibited accurate flow measurements or during the First Flush when an ISCO pump was used to pull sample water from a collection area. At two sites during the Dry Run, Lovers (Pacific Grove) and Pico (Pacific Grove), flow could not be accurately measured due to low flow. During the First Flush at Las Palmas (Monterey County), Bay Street (Seaside and Sand City) and Lovers (Pacific Grove), ISCOs were used to collect sample water. All other instantaneous flow estimates are listed in Table 2.

Table 2: Instantaneous flow estimates in gallons per minute (gpm) per site. NA= data not available due to accessibility to end of pipe because of safety concerns or low flow; NR= Not recorded; NF= No flow.

| | | Site Description | Site ID | Dry Run | First Flush |
|-----------------------|-----------------------|------------------------|--------------|---------|-------------|
| Sites by jurisdiction | Carmel | 4 th Avenue | 307-CASD-01 | NF | 525 |
| | | Ocean Avenue | 307-CASD-02 | NF | 89 |
| | Monterey | Twins | 309-MSD-03 | 8 | 1200* |
| | | San Carlos Beach | 309-MSD-04 | NF | 24* |
| | | Steinbeck | 309-MSD-05 | 1 | 3013 |
| | Monterey County | Boronda | 309-SASD-01 | NF | NA |
| | | Las Palmas | 309-SASD-02 | NF | NA |
| | Pacific Grove | HopkinsMon | 309-PGSD-09 | NF | 100* |
| | | HopkinsPG | 309-PGSD-08 | NF | 97 |
| | | 8 th Street | 309-PGSD-01 | NF | 600* |
| | | Greenwood Park | 309-CENTR-31 | 3.5 | 185 |
| | | Lover's | 309-PGSD-03 | NA | NA |
| | | Pico | 309-PGSD-04 | NA | 300* |
| | Seaside/ Sand City | Bay Street | 309-SSD-02 | NF | NA |

*Flow estimates are based upon one measurement instead of two

Analyte descriptions below are listed alphabetically and include box and whisker graphs that show the data divided into dry weather (DR) and wet weather (FF) results by site. Dry weather monitoring events include Dry Runs and any historical Spring Run and Summer Run events. Wet weather monitoring is inclusive of First Flush and historical Second Flush events, however this year's paired end of pipe and receiving water sampling conducted on January 9, 2020 is listed as a separate sampling event. Box and whisker graphs show a distribution of the dataset in a convenient format for making comparisons between sites and the range of concentrations over the years. The box represents the range of 50% of the data above and below the median. The lines above and below the boxes are upper and lower whiskers and represent the remaining upper and lower 25% of the data. The end point of each whisker represents the maximum and minimum average result for that analyte at that location and provides an indication of the best- and worst-case results. Each graph includes a marker for the most recent year's average results for comparison to historical data as well as a marker for receiving water results which are discussed in Appendix 4. A few analytes have graphs that are split along the y-axis to encompass the entire dataset.

Each analyte description includes a reporting of the Minimum Detection Limit (MDL), the smallest concentration that lab equipment can reliably detect an analyte. MDL is a statistical analysis of the confidence of results. Results below the MDL are reported as non-detect since lab equipment cannot reliably determine where the results lay between zero and the MDL.

Ammonia as N

Ammonia, in conjunction with other analytes can assist in identifying a discharge of sewage as well as industrial or commercial liquid wastes. The SWRCB NPDES MS4 General Permit Action Level for ammonia as N is 50 mg/L; the MDL was 0.1 mg/L for the Dry Run and First Flush. Figure 4 represents all MRSWMP ammonia as N data since 2013. All outfall results are listed in Appendix 2.

- Dry Run and First Flush results:** None of the outfall sites exceeded the Action Level in 2019. End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) collected in January 2020 also did not exceed the Action Level.

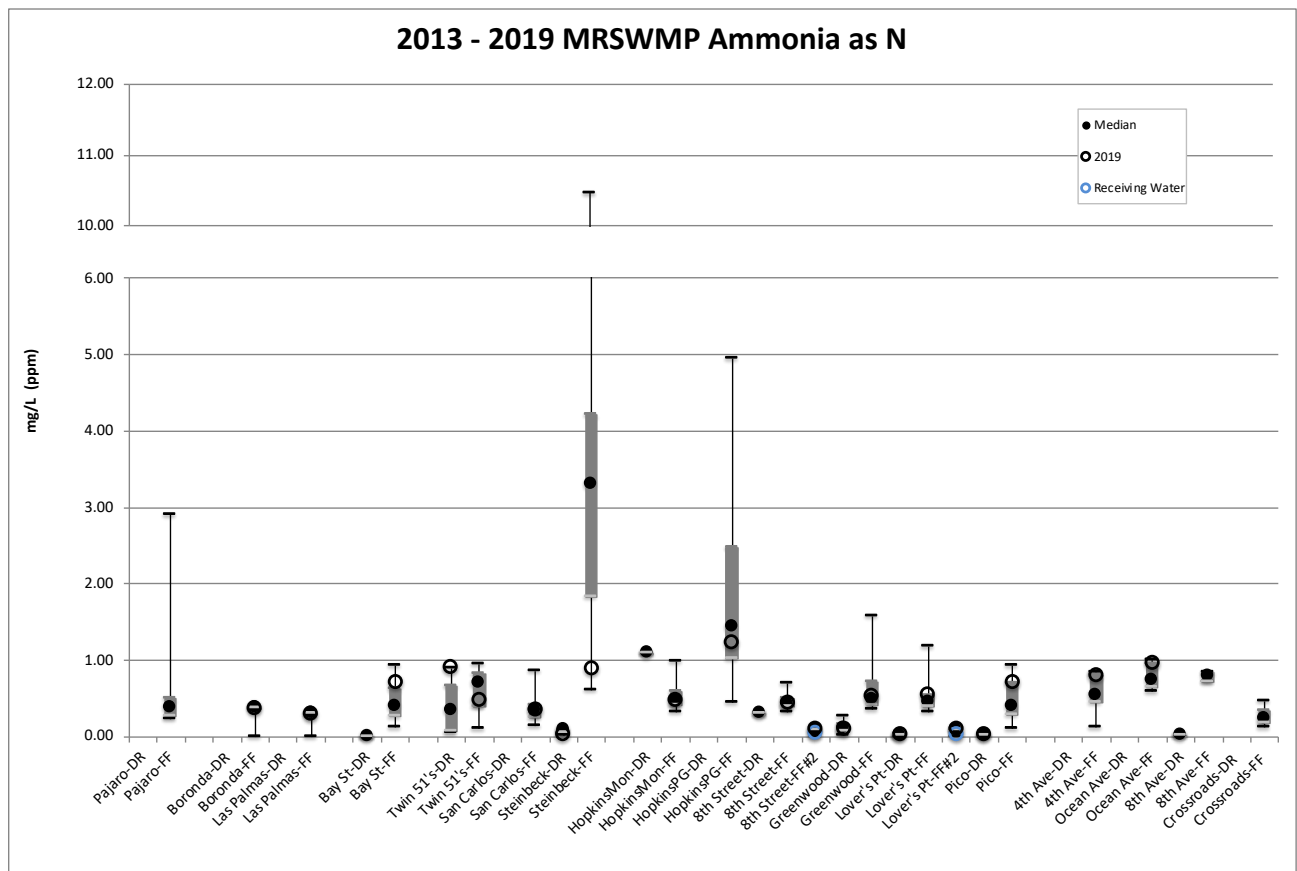


Figure 4. 2013- 2019 MRSWMP ammonia as N results. To better illustrate results, the scale on the graph is split between 6 and 10 mg/L. As a result, First Flush 2014 results from Steinbeck (Monterey) of 10.46 mg/L are in the upper portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Color

Color, in conjunction with other analytes, can assist in identifying a discharge of sewage, wash water, as well as industrial or commercial liquid wastes. The SWRCB NPDES MS4 General Permit Action Level for color is 500 units; the MDL for color was between 3 and 75 color units for the Dry Run and between 3 and 150 color units for the First Flush. Figure 5 represents all MRSWMP color data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** results: None of the outfall sites exceeded the Action Level in 2019.
- **First Flush** results: Only one site exceeded the Action level in 2019: 4th Avenue (Carmel) with an average result of 550 color units. End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) collected in January 2020 did not exceed the Action Level. Monterey County staff did not collect samples for analysis of color at Boronda (Monterey County).

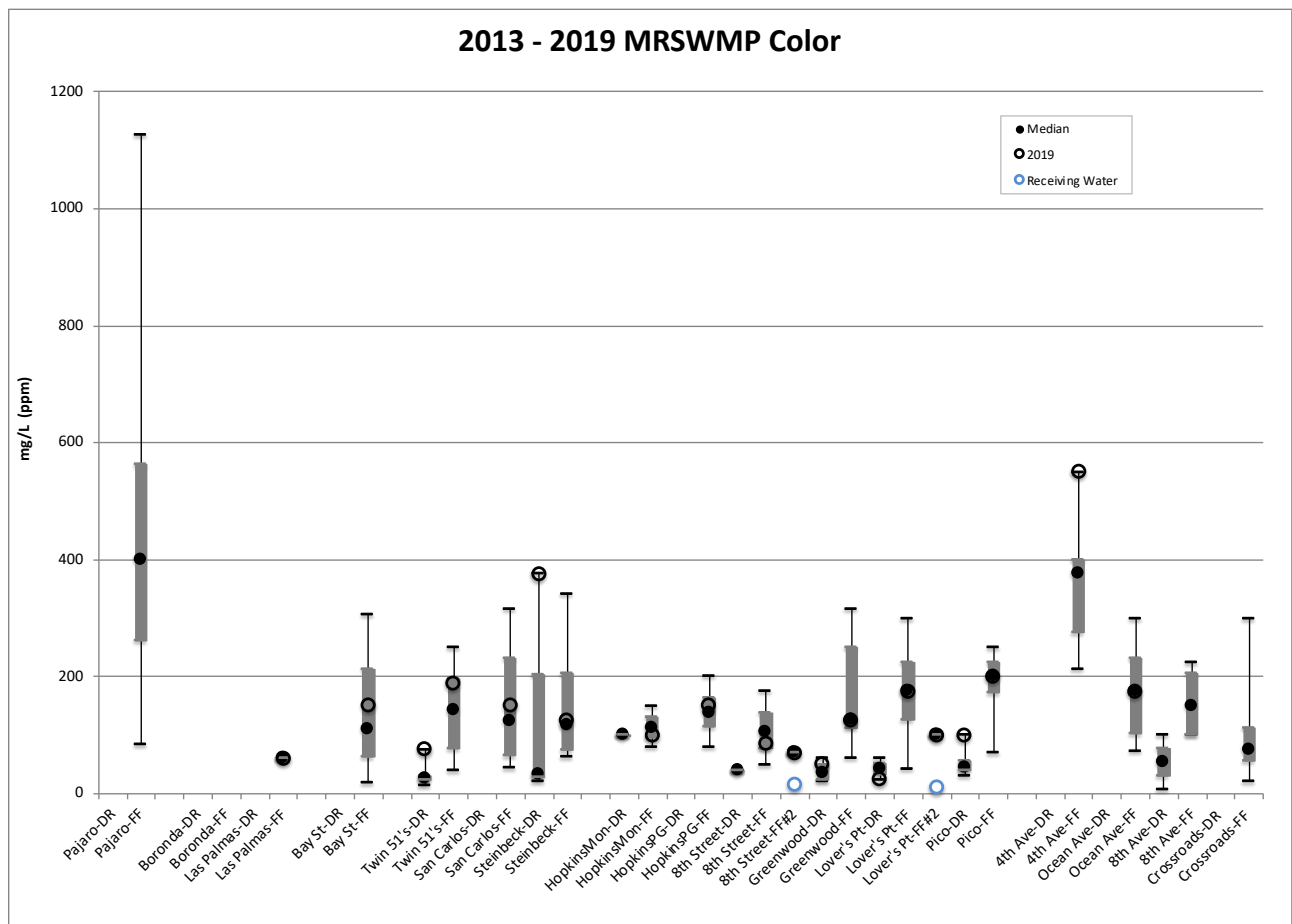


Figure 5. 2013 - 2019 MRSWMP color results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Copper

Copper is toxic to marine organisms and can cause reduced reproduction, developmental deformities, reduced photosynthesis and mortality. Copper and other heavy metal toxicity can be mitigated by the presence of sediment, hardness or other binding compounds that may reduce the metal’s bioavailability. Copper is present in some brake pads, pesticides, wood preservatives, roofing materials, and architectural structures such as gutters and downspouts.

The Basin Plan WQO established for total copper is 30 µg/L; the MDL for copper was 2 and 10 µg/L for the Dry Run and 5 µg/L for the First Flush. Figure 6 represents all MRSWMP copper data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: For 2019 only one site, Steinbeck (Monterey) exceeded the WQO with a result of 193 µg/L.
- **First Flush** results: Four of the fourteen outfall sites monitored (29%) exceeded the WQO in 2019. The highest average result of 84 µg/L was from Ocean Avenue (Carmel). End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) in January 2020 did not exceed the WQO.

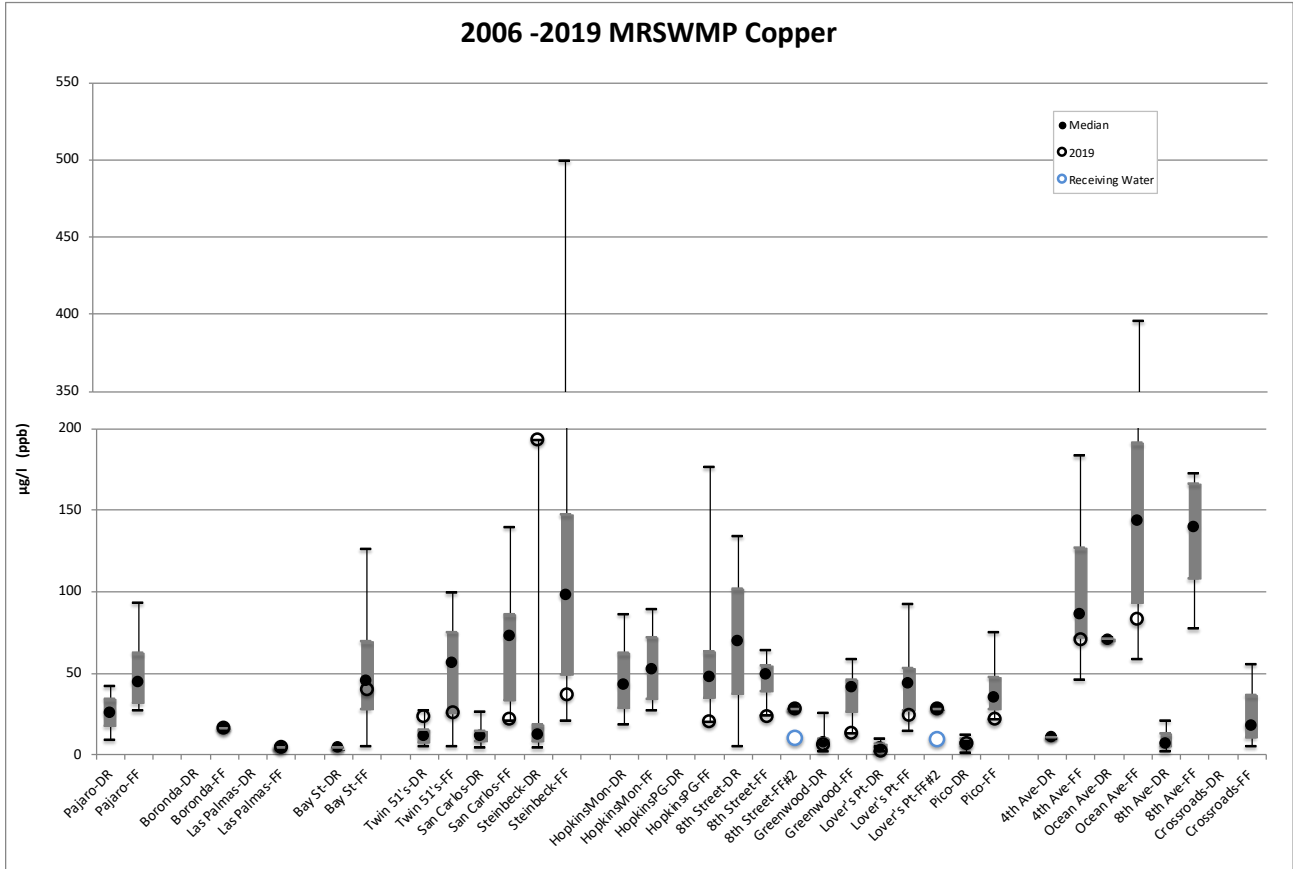


Figure 6. 2006-2019 MRSWMP total copper results. To better illustrate results, the scale on the graph is split between 200 and 350 µg/L. As a result, First Flush 2017 results from Steinbeck (Monterey) of 499 µg/L, and First Flush 2010 results from Ocean Avenue (Carmel) of 395 µg/L are in the upper portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between zero and the MDL. Sites are listed north to south.

Escherichia coli (E. coli)

Escherichia coli (*E. coli*) is a type of indicator bacteria found in warm-blooded animals. While *E. coli* does not cause disease in humans, it is a pollutant of concern because its presence indicates the potential presence of pathogens that do cause disease in humans and wildlife.

The U.S. EPA Ambient Water Quality Criteria for *E. coli* is 235 MPN/100 ml. The MDL for *E. coli* was 10 and 20 MPN/100 ml for the Dry Run and 100 MPN/100 ml for the First Flush. Figure 7 represents all MRSWMP *E. coli* data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: All outfall sites exceeded the WQO for *E. coli* in 2019. The highest *E. coli* result of 17,407 MPN/100 ml was from Lovers (Pacific Grove).
- **First Flush** results: All of the outfall sites including January 2020 end of pipe samples collected at 8th Street (Pacific Grove) and Lovers (Pacific Grove) exceeded the WQO in 2019. The highest average result of 59,850 MPN/100 ml was from Twins (Monterey).

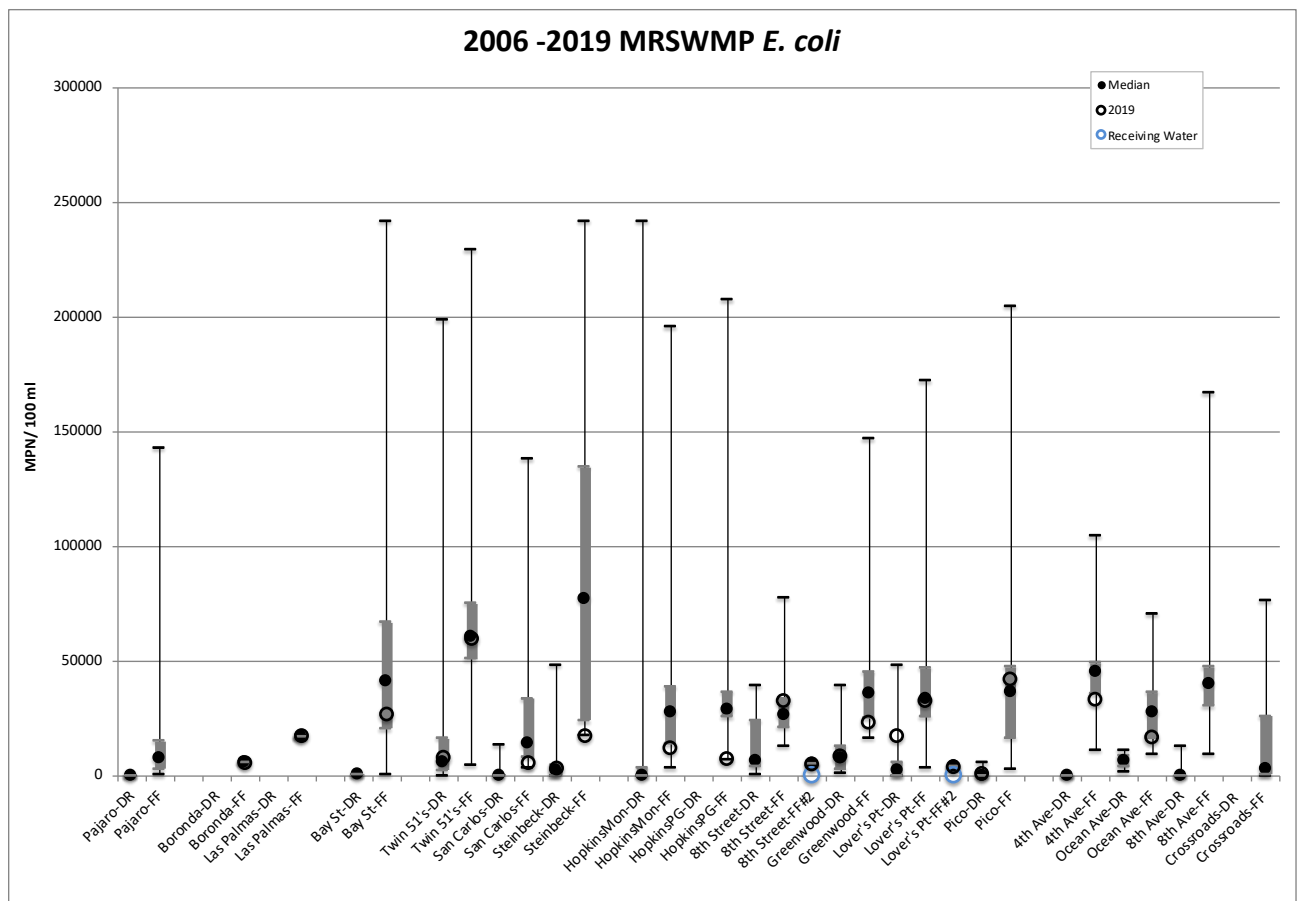


Figure 7. 2006-2019 MRSWMP *E. coli* results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Enterococcus

Enterococcus is another type of indicator bacteria found in warm blooded animals. As described above, it does not cause disease in humans but it is a pollutant of concern because its presence indicates the potential presence of pathogens that do cause disease in humans and wildlife.

The U.S. EPA Ambient Water Quality Criteria for enterococcus is 104 MPN/100 ml. The MDL for enterococcus was 10 and 20 MPN/ 100ml for the Dry Run and 100 MPN/100ml for the First Flush. Figure 8 represents all MRSWMP enterococcus data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: All outfall sites monitored exceeded the WQO for enterococcus in 2019. The highest enterococcus result of 20,925 MPN/ 100 ml was from Lovers (Pacific Grove).
- **First Flush** results: All outfall sites monitored, including January 2020 samples collected at 8th Street (Pacific Grove) and Lovers (Pacific Grove), exceeded the WQO in 2019. The highest average result of 56,880 MPN/100 ml was from Twins (Monterey). Monterey County staff did not collect samples for enterococcus analysis at Boronda (Monterey County).

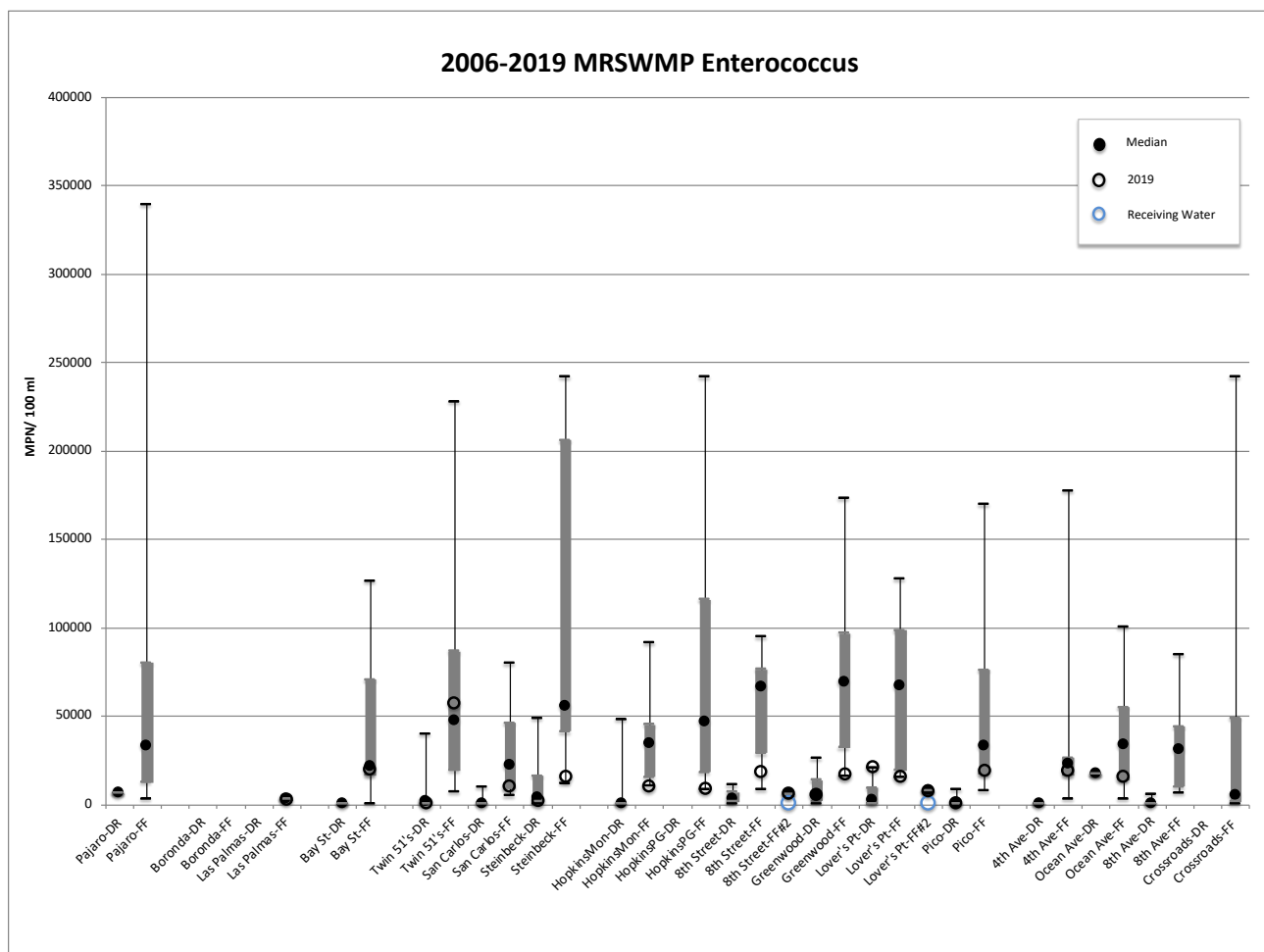


Figure 8. 2006-2019 MRSWMP enterococcus results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Hardness (as CaCO₃)

Hardness (as CaCO₃) in conjunction with other analytes, can assist in identifying a discharge of sewage, wash water, tap water as well as industrial or commercial liquid wastes. Additionally, when hardness increases, the amount of dissolved metals biologically available to aquatic and marine life decreases resulting in a decrease in the toxicity of the metal.

The SWRCB NPDES MS4 General Permit Action Level for hardness is not less than or equal to 10 mg/L or greater than or equal to 2,000 mg/L; the MDL for hardness (as CaCO₃) was 10 mg/L for both the Dry Run and First Flush. Figure 9 represents all MRSWMP hardness data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run and First Flush** results: None of the outfall results exceeded the acceptable range in 2019. End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) collected in January 2020 were also within the acceptable range.

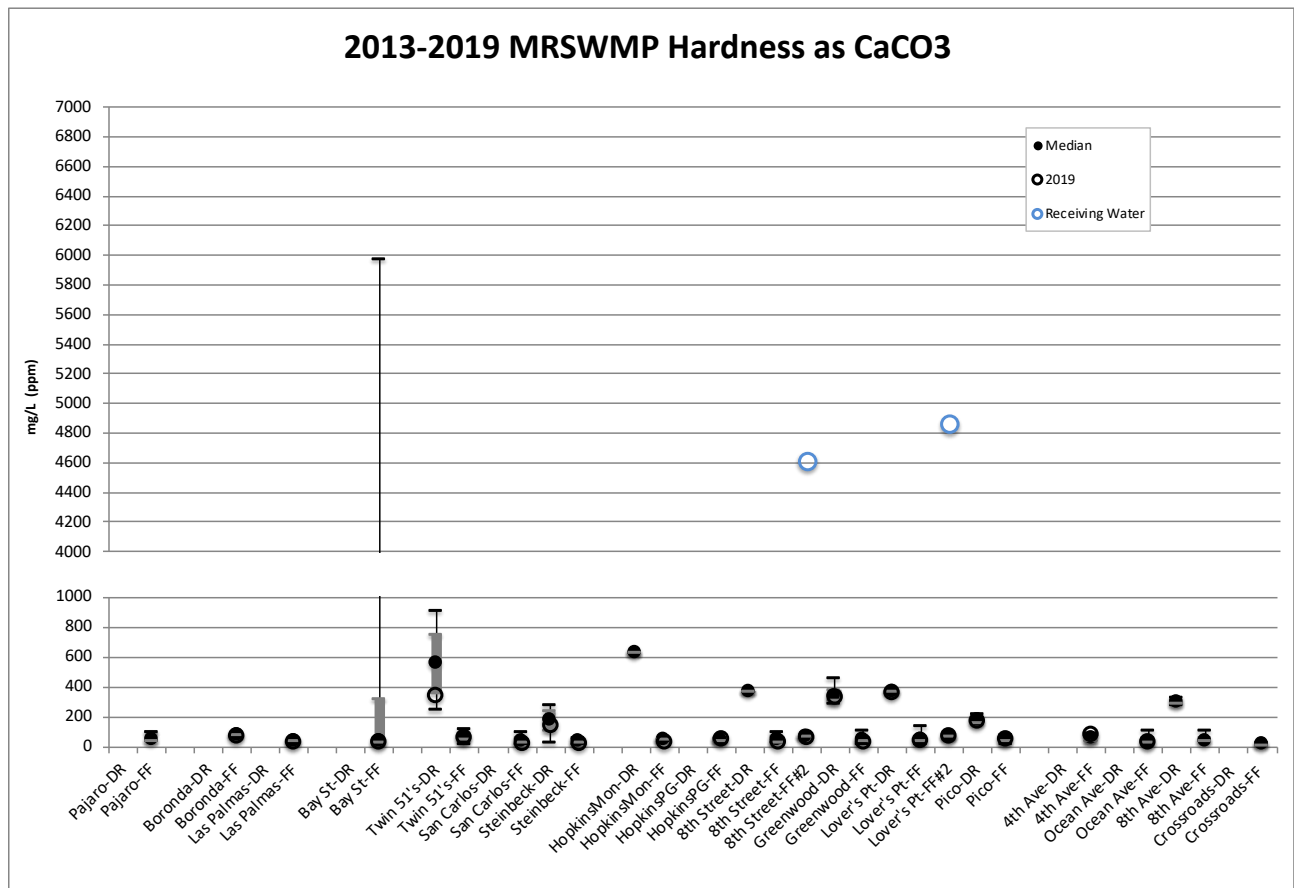


Figure 9. 2013 - 2019 MRSWMP hardness (as CaCO₃) results. To better illustrate results, the scale on the graph is split between 1000 and 4000 mg/L. As a result, First Flush 2018 results from Bay Street (Seaside and Sand City) of 5970 mg/L, 8th Street (Pacific Grove) Receiving Water of 3630 mg/L, and Lovers (Pacific Grove) Receiving Water of 5310 mg/L, are in the top portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Lead

Lead is toxic to marine organisms causing reduced reproduction, developmental deformities, reduced photosynthesis and mortality. Lead and other heavy metal toxicity can be mitigated by the presence of sediment, hardness or other binding compounds that may reduce the metal's bioavailability. Lead is present in some types of paint, water distribution systems, auto emissions and can be passed through the food web via uptake by plants that are grown in lead contaminated soils.

The Basin Plan WQO established for total lead is 30 µg/L; the MDL for lead was 1 µg/L for both the Dry Run and First Flush. Figure 10 represents all MRSWMP lead data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: None of the outfall sites exceeded the WQO in 2019. A single non-detect was reported at the Lovers (Pacific Grove) outfall site.
- **First Flush** results: None of the outfall sites exceeded the WQO in 2019 including those from end of pipe sampling at 8th Street (Pacific Grove) and Lovers (Pacific Grove) in January 2020. Monterey County staff did not collect samples for analysis of lead at Boronda (Monterey County).

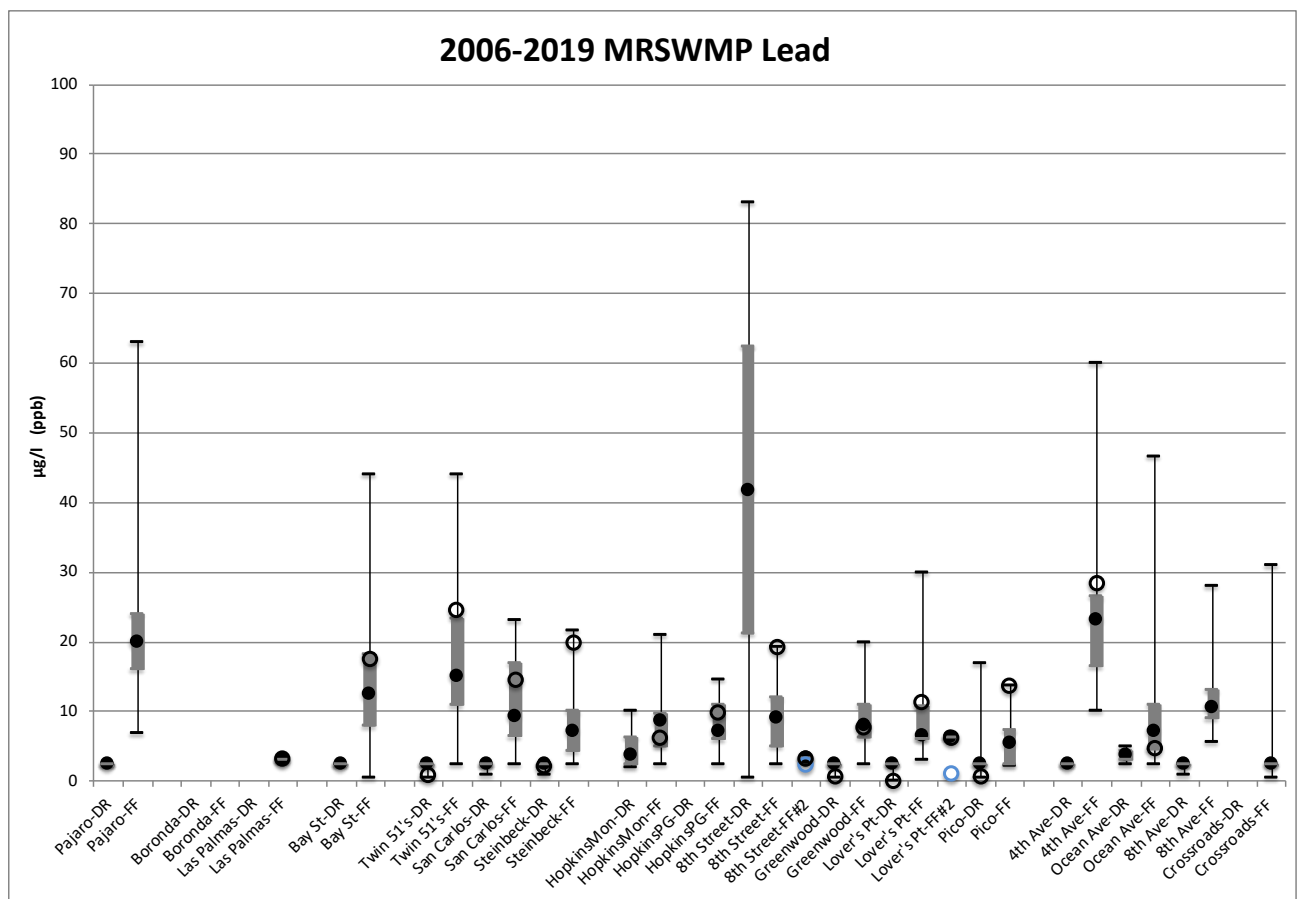


Figure 10. 2006-2019 MRSWMP lead results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

MBAS Detergents

MBAS detergents in sample water can indicate a discharge from sewage or wash water, and in conjunction with other analytes, can assist in identifying a discharge of industrial or commercial liquid wastes.

The Basin Plan’s WQO established for MBAS detergents is 0.2 mg/L; the MDL for MBAS detergents was 0.05 and 0.1 mg/L for the Dry Run and 0.2 mg/L for the First Flush. Figure 11 represents all MRSWMP MBAS detergent data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** results: Two of the five sites (40%) were above the WQO for MBAS concentrations in 2019. The highest result of 0.26 mg/L was from Steinbeck (Monterey).
- **First Flush** results: All results (100%) were above the WQO in 2019. The highest average result of 0.58 mg/L was from Ocean Avenue (Carmel). End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) collected in January 2020 also exceeded the WQO. Monterey County staff did not collect samples for MBAS analysis at Boronda (Monterey County).

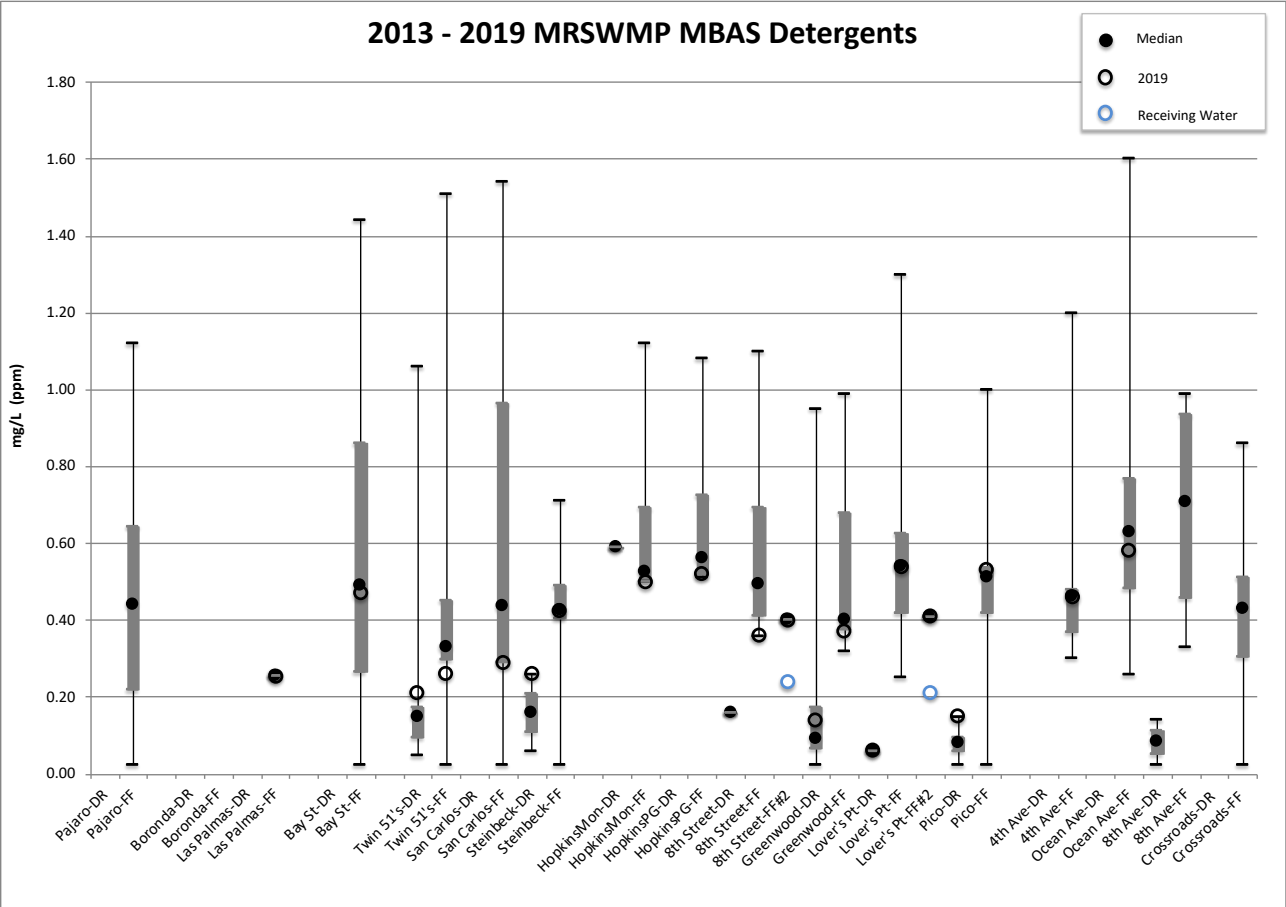


Figure 11. 2013 - 2019 MRSWMP MBAS detergent results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Nitrate as N

Nitrogen is an element needed for plant growth. Primary sources of nitrate in runoff include overwatering of fertilized lawns, agricultural and pasture lands, construction sites, and septic or sewer system leachate. Nitrate in runoff can lead to excessive nitrate in groundwater or increased growth of algal blooms that degrade water quality as algae die off and consume oxygen in their decomposition.

The CCAMP Action Level for nitrate as N ($\text{NO}_3\text{-N}$) is 2.25 mg-N/L. The MDL was 0.01 mg-N/L for the Dry Run and 0.1 to 0.4 mg-N/L for the First Flush. Figure 12 represents all MRSWMP nitrate as N data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: Just one site had results that exceeded the Action Level in 2019: Steinbeck (Monterey) with a result of 6.4 mg/L.
- **First Flush** results: No results exceeded the Action Level in 2019. End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) collected in January 2020 also did not exceed the Action Level.

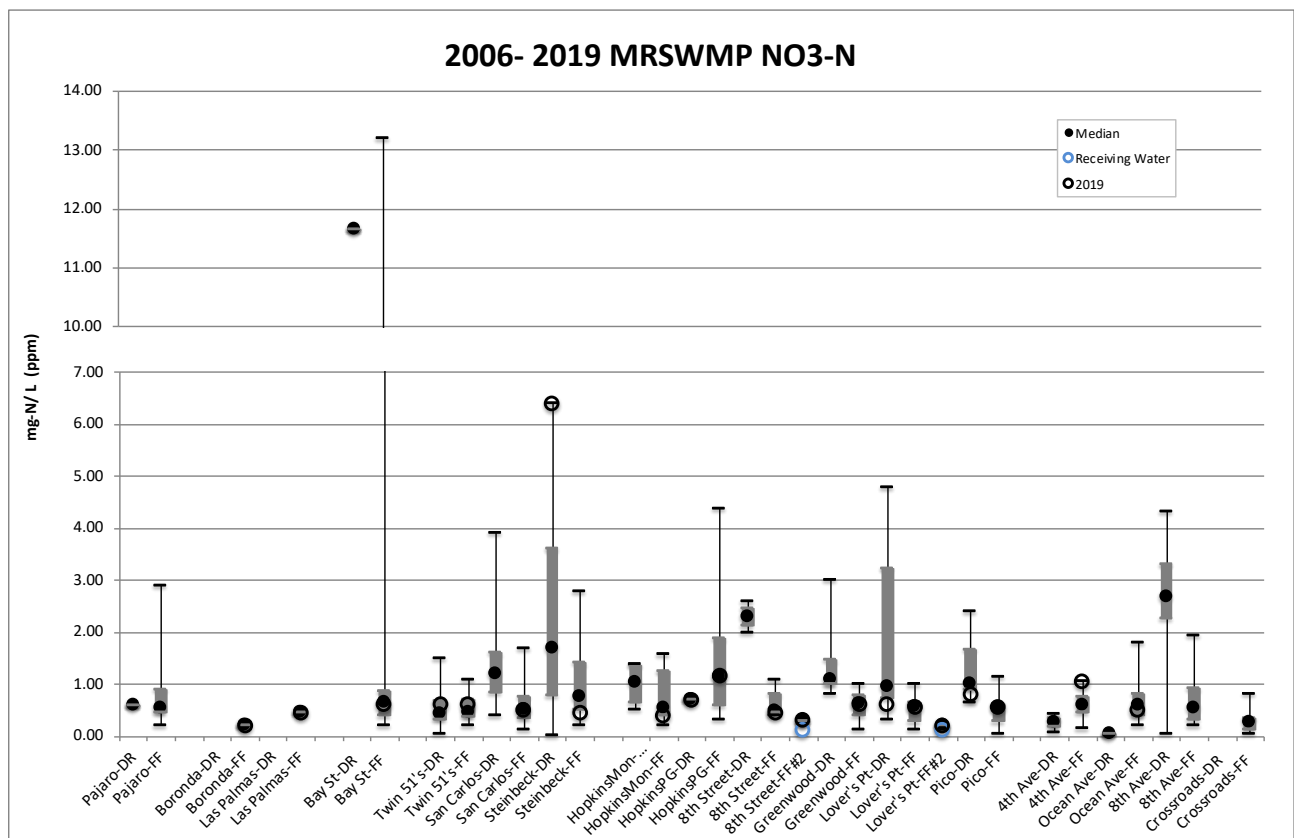


Figure 12. 2006-2018 MRSWMP nitrate as N ($\text{NO}_3\text{-N}$) results. To better illustrate results, the scale on the graph is split between 7.00 and 10.00 mg-N/L. As a result, two results from Bay Street (Seaside and Sand City), one from First Flush 2006 of 13.2 mg/L, and Spring Run 2011 of 11.64 mg/L, are in the upper portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Orthophosphate as P

Phosphorus is an essential element for plant growth. Orthophosphate is a form of phosphorus commonly found bound to soil particles, in sewage, fertilizers, and in detergents that contain phosphates. In aquatic systems, orthophosphate is rapidly taken up by algae and aquatic plants. When excessive amounts are present, large algal blooms can occur which can lead to degraded water quality conditions toxic to marine or aquatic life.

The CCAMP Action Level for orthophosphate as P ($\text{PO}_4\text{-P}$) is 0.12 mg-P/L. The MDL was 0.1 and 0.01 mg-P/L for the Dry Run and between 0.1 mg-P/L First Flush. Figure 13 represents all MRSWMP orthophosphate as P data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: In 2019 three of the outfall sites (21%) had results that exceeded the Action Level. The highest result of 0.71 was from Twins (Monterey).
- **First Flush** results: All results exceeded the Action Level in 2019. The highest average result of 1.00 mg-P/L was from 4th Avenue (Carmel). End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) collected in January 2020 also exceeded the Action Level.

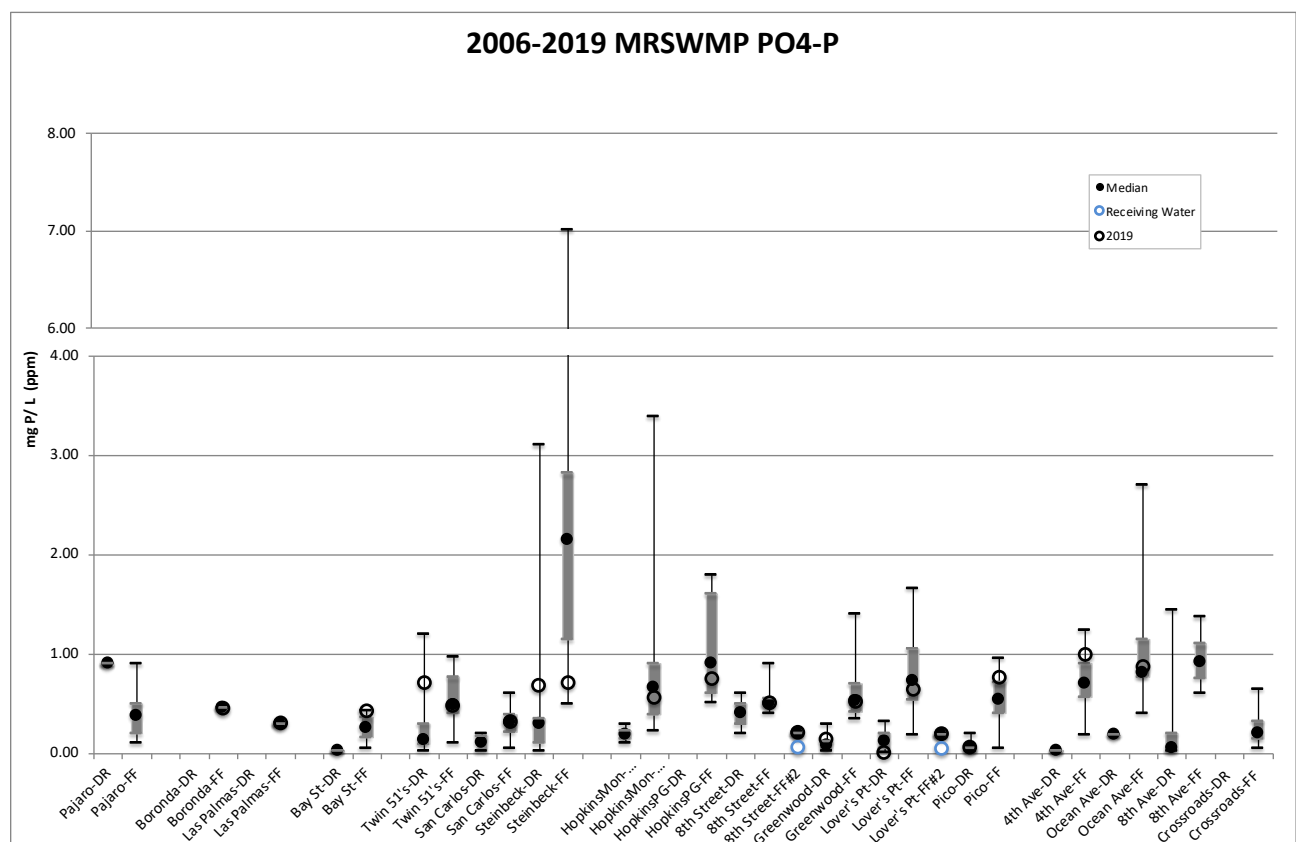


Figure 13. 2006-2019 MRSWMP orthophosphate as P ($\text{PO}_4\text{-P}$) results. To better illustrate results, the scale on the graph is split between 4.00 and 6.00 mg-P/L. As a result, the First Flush 2010 result of 7.01 mg/L from Steinbeck (Monterey) is in the upper portion of the chart. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Potassium

Potassium, in conjunction with other analytes, can assist in identifying a discharge of sewage, industrial, or commercial liquid wastes.

The SWRCB NPDES MS4 General Permit Action Level for potassium is 20 mg/L; the MDL was 0.5 mg/L for the Dry Run and First Flush. Figure 14 represents all MRSWMP potassium data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** results: No sites exceeded the Action Level in 2019.
- **First Flush** results: In 2019 none of the outfall sites exceeded the Action Level. End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) collected in January 2020 also did not exceed the Action Level. Monterey County staff did not collect samples for analysis of potassium at Boronda (Monterey County).

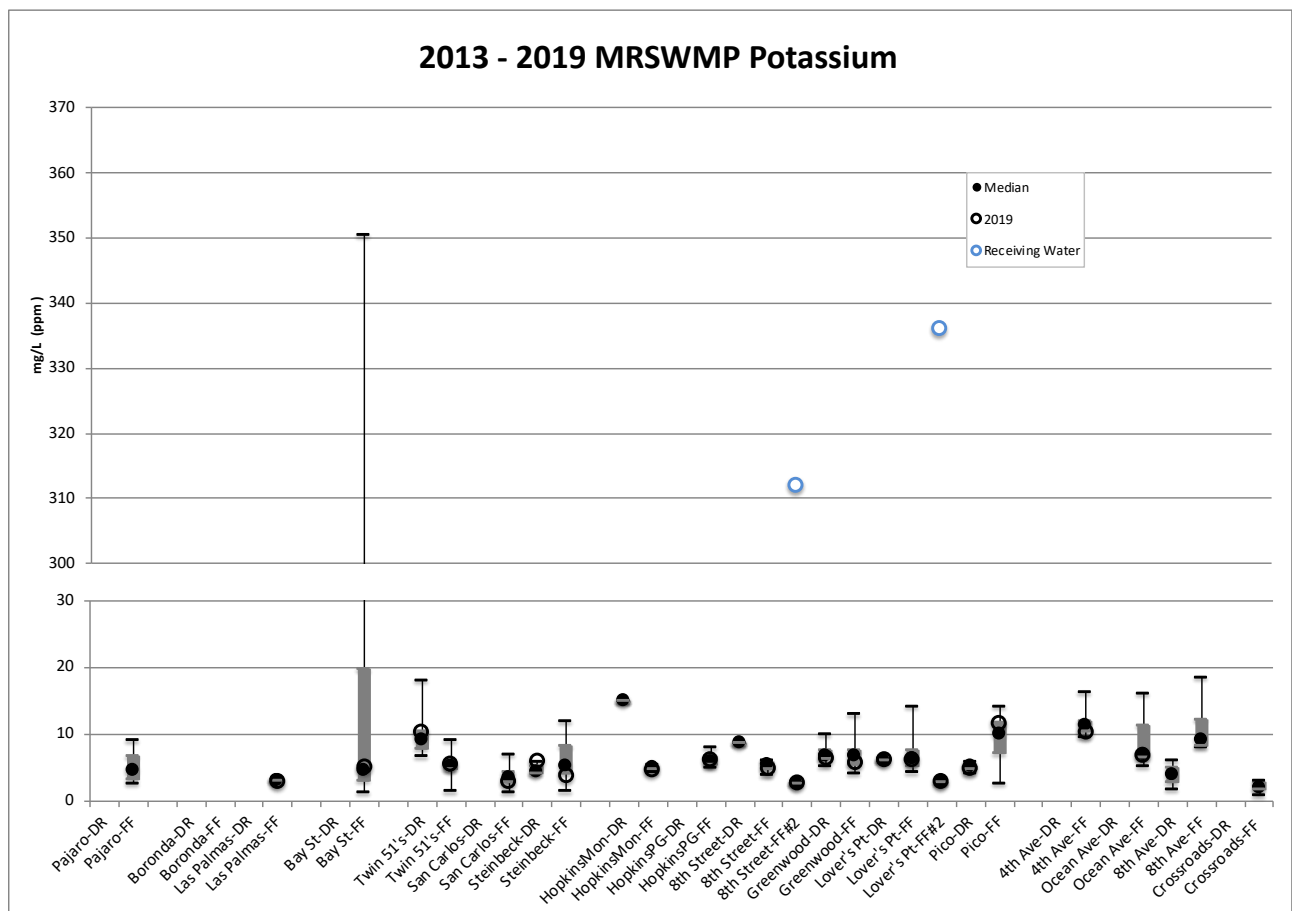


Figure 14. 2013 - 2019 MRSWMP potassium results. To better illustrate results, the scale on the graph is split between 30 and 300 mg/L. As a result, First Flush 2018 result from Bay Street (Seaside and Sand City) of 351 mg/L, 8th Street (Pacific Grove) Receiving Water of 312 mg/L, and Lovers (Pacific Grove) Receiving Water of 336 mg/L are all in the top portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Total Suspended Solids

Total suspended solids (TSS) are measured because high amounts of sediment can destroy habitat, suffocate eggs in fresh water systems, limit the food supply, clog gills or impair an organism's vision when feeding.

The CCAMP Action Level for TSS is 500 mg/L; the MDL was 2 mg/L for both the Dry Run and First Flush. Figure 15 represents all MRSWMP TSS data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: No sites exceeded the Action Level in 2019. Two sites, Lovers (Pacific Grove) and Pico (Pacific Grove), had non-detects.
- **First Flush** results: Only one site exceeded the Action Level in 2019: Boronda (Monterey County) had a single sample result of 724 mg/L when it was monitored one day after First Flush by county staff. End of pipe samples from 8th Street (Pacific Grove) and Lovers (Pacific Grove) collected in January 2020 did not exceed the Action Level.

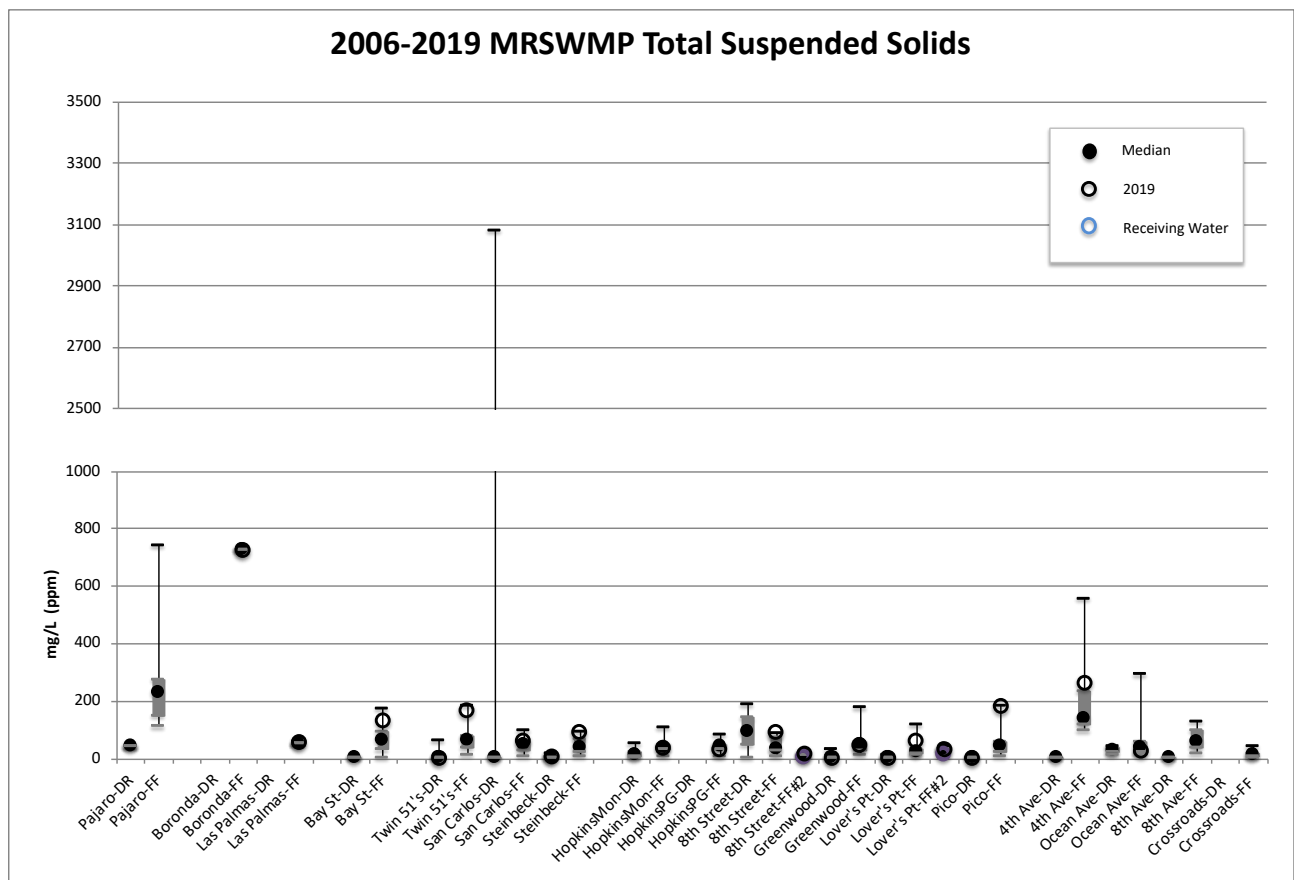


Figure 15. 2006-2019 MRSWMP TSS results. To better illustrate results, the scale on the graph is split between 1000 and 2500 mg/L. As a result, the Dry Run 2007 result of 3080 mg/L from San Carlos (Monterey) is in the top portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Turbidity

Turbidity measures the transparency of water while TSS measures the weight of the solids in the water that contribute to less transparency. Both are useful measurements for water clarity but have different methodologies for analysis.

The Action Level for turbidity provided by the State Board in the General Permit is not greater than 1000 NTU. As a comparison CCAMP lists turbidity to be not greater than 25 NTU; the CCAMP Action Level will be used for this set of data as it is more protective of water quality. The MDL for the Dry Run was 0.05 NTU and between 0.5 and 2.5 NTU for the First Flush. Figure 16 represents all MRSWMP turbidity data since 2013. All outfall results are listed in Appendix 2.

- **Dry Run** results: No sites exceeded the Action Level in 2019.
- **First Flush** results: Ten of the monitored sites (71%) exceeded the Action Level in 2019. The highest result of 900 NTU was from Boronda (Monterey County) where one sample was collected the day after First Flush. End of pipe samples collected in January 2020 from 8th Street (Pacific Grove) and Lovers (Pacific Grove) did not exceed the Action Level.

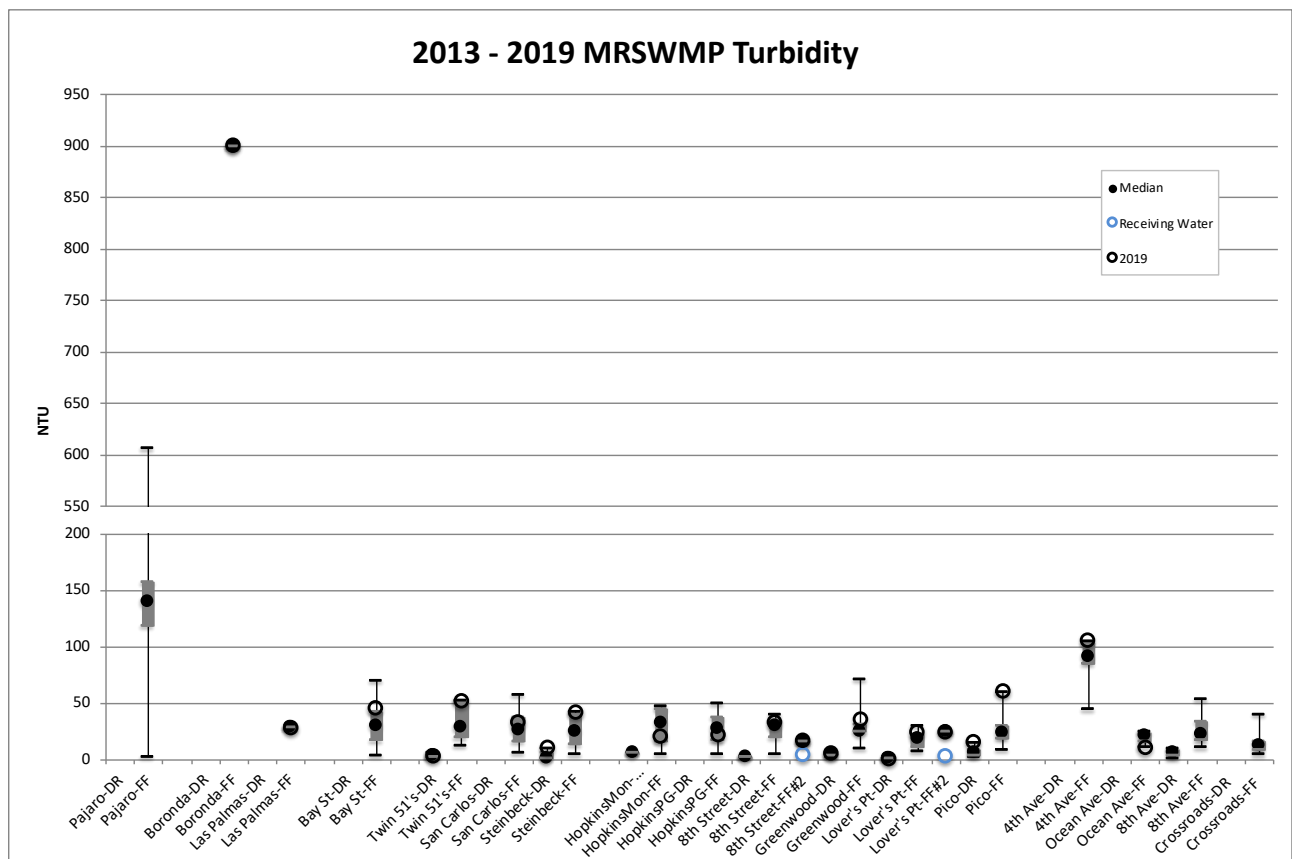


Figure 16. 2013- 2019 MRSWMP turbidity results. To better illustrate results, the scale on the graph is split between 200 and 550 NTU. As a result, the First Flush 2017 result of 606 NTU from Pajaro (Monterey County) is in the top portion of the graph. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Urea

Urea is an organic compound that is often used in agricultural and urban fertilizers. While there is not an established Action Level or WQO, urea concentrations are compared between sites. The MDL for urea was 10 µg/L for the Dry Run and 10 and 20 µg/L for the First Flush. Figure 17 represents all MRSWMP urea data since 2006. During the First Flush urea was collected during the first time series only; results shown in Figure 17 are not averaged. All outfall results are listed in Appendix 2.

- **Dry Run** results: In 2019 the highest urea result of 197 µg/L was from Twins (Monterey).
- **First Flush** results: In 2019 the highest result of 481 µg/L was from Ocean Avenue (Carmel). End of pipe samples collected in January 2020 from 8th Street (Pacific Grove) had a concentration of 57 µg/L and 122 µg/L at Lovers (Pacific Grove). Monterey County staff did not collect samples for analysis of urea at Boronda (Monterey County).

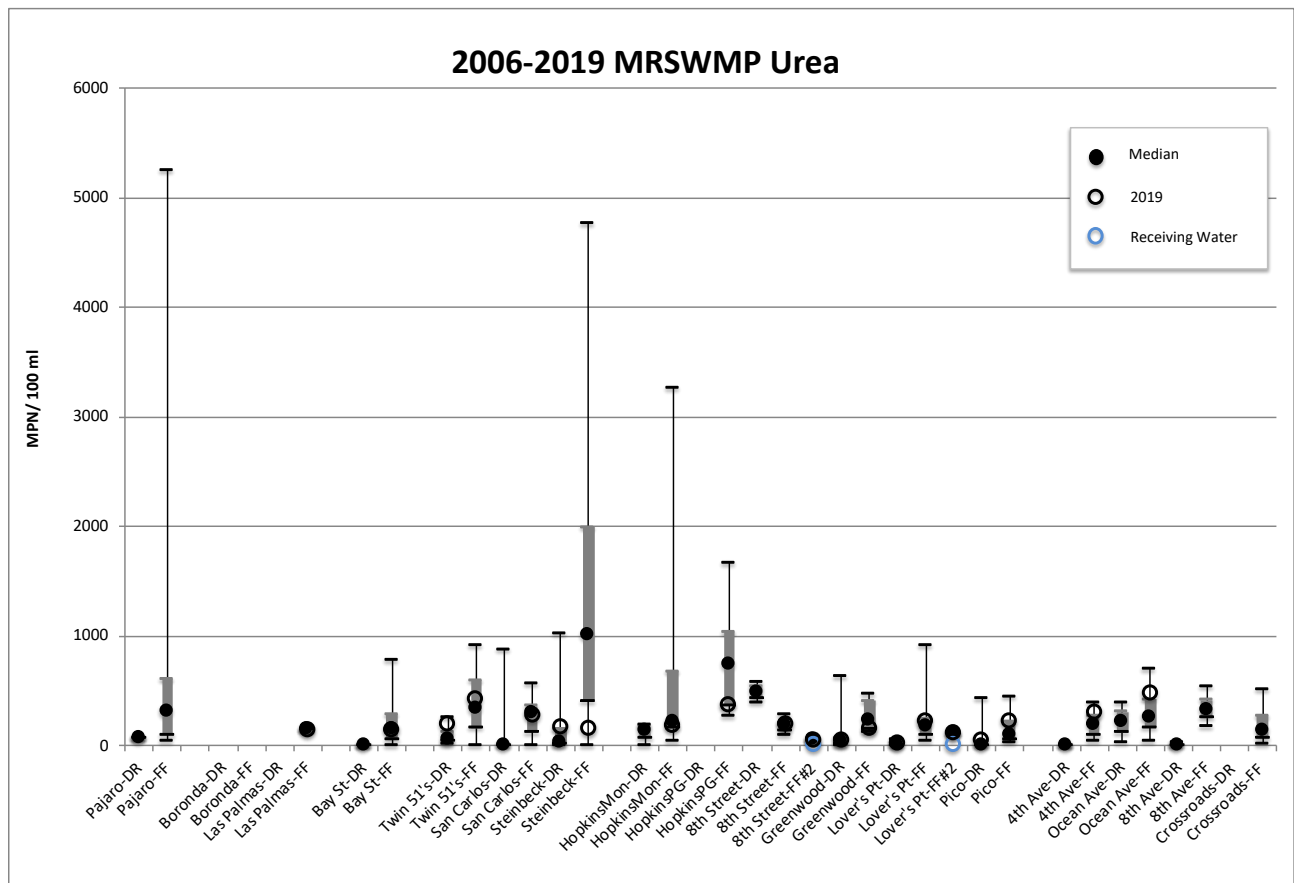


Figure 17. 2006–2019 MRSWMP urea results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Zinc

Zinc is toxic to marine organisms causing reduced reproduction, developmental deformities and mortality. Zinc and other heavy metal toxicity can be mitigated by the presence of sediment or other binding compounds that may reduce the metal's bioavailability. Zinc sources in urban runoff include tires, paint, and outdoor zinc surfaces such as galvanized surfaces.

The Basin Plan WQO for total zinc is 200 µg/L. The zinc MDL was 10 µg/L for the Dry Run and First Flush. Figure 18 represents all MRSWMP zinc data since 2006. All outfall results are listed in Appendix 2.

- **Dry Run** results: No sites exceeded the WQO in 2019. One outfall site had a non-detect: Lovers (Pacific Grove).
- **First Flush** results: Three sites (23%) were above the WQO in 2019. The highest average result of 286 µg/L was from HopkinsPG (Pacific Grove). End of pipe samples collected in January 2020 did not exceed the WQO. Monterey County staff did not collect samples for zinc analysis at Boronda (Monterey County).

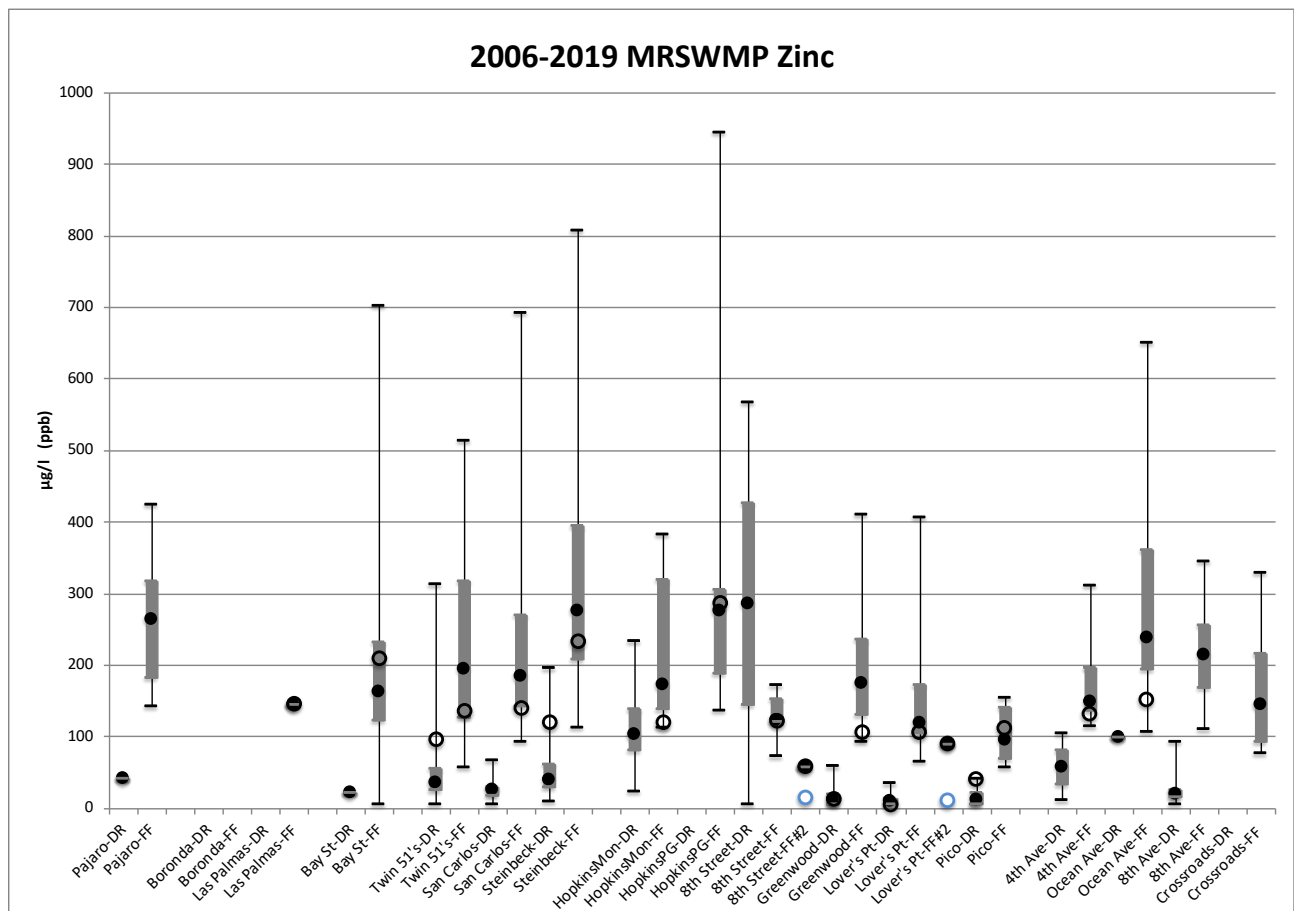


Figure 18. 2006-2019 MRSWMP zinc results. Non-detects were given the value of half the Minimum Detection Limit (MDL) but their true value lies between the zero and the MDL. Sites are listed north to south.

Results by Jurisdiction

The following section is broken out by city or county for this permit year.

Carmel

For the 2019-2020 permit year, two sites were monitored in Carmel: 4th Avenue and Ocean Avenue. There was no flow at either of the sites for the Dry Run.

For the First Flush:

- Color results exceeded the WQO in the first sample at 4th Avenue with a result of 750 color units, and in the overall average for the site at 550 color units.
- Copper exceeded the Basin Plan WQO in all samples at all sites. The highest single sample copper result and the highest average copper result was from Ocean Avenue with results of 81 µg/L and 86 µg/L respectively and an average of 84 µg/L.
- *E. coli* and enterococcus results exceeded the U.S. EPA WQO in all samples at all sites.
- Lead results exceeded the WQO in the first sample at 4th Avenue.
- MBAS surfactant results exceeded the Basin Plan WQO in all samples at all sites. Ocean Avenue had the highest overall average for the 2019 MRSWMP monitoring with a result of 0.58 mg/L for both time series.
- Orthophosphate as P results exceeded the CCAMP Action Level in all samples at all sites. The 4th Avenue site had the highest average result of 1.0 mg-P/L of all 2019 MRSWMP sites.
- Turbidity results exceeded the CCAMP Action Level for both samples at 4th Avenue.
- Ammonia, hardness, nitrate as N, potassium, total suspended solids and zinc results were all below WQOs and Action Levels for both time series samples at all sites.

All 2019 outfall results can be found in Appendix 2 and by jurisdiction in Appendix 3.

Monterey

For the 2019-2020 permit year, three sites were monitored: Twins, San Carlos, and Steinbeck. Twins and Steinbeck were the only Monterey sites that had flowing water during the Dry Run.

For the Dry Run (Twins and Steinbeck only):

- Copper results exceeded the WQO and were the highest of all Dry Run sites at Steinbeck with a result of 193 µg/L.
- *E. coli* and enterococcus results exceeded the U.S. EPA WQOs at both sites.
- MBAS Surfactant results exceeded the WQO and were the highest of all Dry Run sites at Steinbeck with a result of 0.26 mg/L.
- Nitrate as N results exceeded the CCAMP Action Level and were the highest of all Dry Run sites at Steinbeck with a result of 6.4 mg-N/L.
- Orthophosphate as P results exceeded the CCAMP Action Level and were the highest of all Dry Run sites at Twins with a result of 0.71 mg-P/L
- No other Action Levels or WQOs were exceeded during the Dry Run for any other analytes.

During the First Flush:

- Copper exceeded the Basin Plan WQO in all samples from Steinbeck. There were no exceedances at Twins or San Carlos.
- *E. coli* and enterococcus exceeded the U.S. EPA WQO in all samples at all Monterey sites. Twins had the highest average *E. coli* and enterococcus results of all First Flush sites with results of 59,850 MPN/100ml for *E. coli* and 56,880 MPN/ 100 ml for enterococcus.
- Lead results exceeded the RWQCB Basin Plan WQO in the first sample at Steinbeck with a result of 37.4 µg/L. While no other sites exceeded the WQO in any samples, Twins came very close to exceeding the WQO in the first sample with a result of 29.6 µg/L
- MBAS detergents exceeded the Basin Plan WQO in all samples at all Monterey sites.
- Orthophosphate exceeded the CCAMP Action Level in all samples at all Monterey sites.
- Turbidity exceeded the CCAMP Action Level in all samples from San Carlos and Twins, and one sample from Steinbeck.
- Zinc exceeded the RWQCB Basin Plan WQO for both samples at Steinbeck. There were no exceedances at Twins or San Carlos.
- Ammonia, color, hardness, nitrate as N, potassium, and total suspended solids were all below WQOs and Action Levels for both time series samples at all sites.

All 2019 outfall results can be found in Appendix 2 and by jurisdiction in Appendix 3.

Monterey County

For the 2019-2020 permit year, two sites were monitored: Boronda and Las Palmas. There was no flow at either site during the Dry Run.

During the First Flush:

- *E. coli* results exceeded the U.S. EPA WQO in all samples at both Monterey County sites.
- Enterococcus was only measured at Las Palmas and results exceeded the U.S. EPA WQO in both samples.
- MBAS surfactants were only measured at Las Palmas. Results exceeded the RWQCB Basin Plan WQO in both samples.
- Orthophosphate results exceeded the CCAMP Action Level in the single sample at Boronda and both samples from Las Palmas.
- Total suspended solids exceeded the CCAMP Action Level for the single sample at Boronda and was the highest of all samples with a result of 724 mg/L (collected one day after First Flush).
- Turbidity results exceeded the CCAMP Action Level at both sites. Boronda had the highest single sample result of all First Flush samples with a result of 900 mg/L.
- Ammonia, color, copper, hardness, lead, nitrate as N, potassium and zinc results did not exceed WQOs or Action Levels for any samples during the First Flush.

All 2019 outfall results can be found in Appendix 2 and by jurisdiction in Appendix 3.

Pacific Grove

For the 2019-2020 permit year, six sites were monitored: HopkinsMon, HopkinsPG, 8th Street, Greenwood Park, Lovers and Pico. Hopkins Mon, Hopkins PG, 8th Street, Greenwood Park, and Lovers are included in a dry weather diversion that diverts dry weather urban runoff typically from April to October to Monterey One Water for treatment. In recent years, the diversion has been left on throughout the winter season and can impact whether water flows to the ocean from storm drains located within the diversion area. For the 2019 Dry Run and First Flush the diversion remained in operation. Dry Run samples were collected at the following sites: Greenwood Park (upstream of the diversion), Pico (outside of the diversion area) and Lovers. All sites were sampled during the First Flush despite the operation of the diversion.

For the Dry Run (Greenwood Park, Lovers and Pico):

- *E. coli* was above the U.S. EPA WQO at all sites. The highest *E. coli* result for all MRSWMP 2019 sites of 17,407 MPN/100 ml was from Lovers.
- Enterococcus was above the U.S. EPA WQO at all sites. The highest result for all MRSWMP 2019 sites of 20,925 MPN/100 ml was from Lovers.
- Orthophosphate as P exceeded the Action Level at only one site, Greenwood Park, with a result of 0.14 mg/L.
- Ammonia, color, copper, hardness, lead, MBAS surfactants, nitrate as N, potassium, total suspended solids, turbidity and zinc were all below WQOs and Action Levels at all sites.

During the First Flush:

- *E. coli* results exceeded the U.S. EPA WQO in all samples at all sites.
- Enterococcus results exceeded the U.S. EPA WQO in all samples at all sites.
- MBAS surfactants results exceeded the RWQCB Basin Plan WQO for all samples at all sites.
- Orthophosphate results exceeded the CCAMP Action Level in all samples at all sites.
- Turbidity results exceeded the CCAMP Action Level for all samples at 8th Street and Pico, and the first sample at Greenwood Park.
- Zinc results exceeded the RWQCB Basin Plan WQO at HopkinsPG and was the highest of all 2019 MRSWMP sites with sample results of 263 µg/L and 309 µg/L. This was the same in 2018.
- Ammonia, color, copper, hardness, lead, nitrate as N, potassium, and total suspended solids were all below WQOs and Action Levels for both time series samples at all sites.

All 2019 outfall results can be found in Appendix 2 and by jurisdiction in Appendix 3.

Seaside and Sand City

For the 2019-2020 permit year, Bay Street was the only site monitored, and as in past years, this site had no flow for the Dry Run monitoring event.

During the First Flush:

- Copper results exceeded the Basin Plan WQO in both samples.
- *E. coli* and enterococcus exceeded the U.S. EPA WQO for both samples.
- MBAS surfactant results exceeded the RWQCB Basin Plan WQO in both samples.
- Orthophosphate exceeded the CCAMP Action Level in both samples.
- Turbidity results exceeded the CCAMP Action Level in both samples.
- Zinc results exceeded the RWQCB Basin Plan WQO in the first sample.
- Ammonia, color, hardness, lead, nitrate as N, potassium and total suspended solids results did not exceed any WQOs or Action Levels for any samples.

All 2019 outfall results can be found in Appendix 2 and by jurisdiction in Appendix 3.

Conclusion

Since 2006, the MRSWMP program has utilized MBNMS' Dry Run and First Flush programs to ascertain what concentrations of pollutants are found in both dry and wet weather flows through storm drains that discharge into surface waters or the ocean. The outfall sites monitored as part of the MRSWMP program are sites that provide a good representation of water quality throughout a jurisdiction and in some cases have been monitored for many years. For the 2019- 2020 permit year, fourteen outfall sites were monitored for the Dry Run and First Flush in six jurisdictions: Monterey County, Seaside-Sand City, Monterey, Pacific Grove and Carmel-by-the-Sea.

In past years, approximately half of the MRSWMP outfall sites did not flow during the dry weather months. This year, five (36%) of the fourteen storm drain outfalls had flow for the Dry Run: Twins (Monterey), Steinbeck (Monterey), Greenwood Park (Pacific Grove), Lovers (Pacific Grove) and Pico (Pacific Grove). Dry weather data can be an indicator of the effectiveness of storm water programs. More dry sites during the Dry Run and reduction of concentrations of pollutants in the runoff are indicators of a successful program. Dry weather monitoring also allows for tracking potential sources of contamination in discharges.

Receiving water samples provide information on the fate and dilution of urban watershed pollutants in the ocean. By pairing receiving water with end of pipe samples, initial concentrations can provide insight into the level of pollutants coming off urban areas. This year's receiving water samples, collected on January 9, 2020 at two sites (8th Street and Lovers in Pacific Grove), showed levels above the Water Quality Objectives of *E. coli*, enterococcus and MBAS Detergents in both end of pipe and receiving water samples. Only end of pipe samples had results that exceeded the Water Quality Objectives for orthophosphate, while only receiving water sample results exceeded the Water Quality Objectives for potassium and hardness.

The First Flush event provides an understanding of the types of pollutants flowing into Monterey Bay National Marine Sanctuary after months of dry weather during which contaminants accumulate on streets, roofs, and parking lots. While wet weather samples do indicate the worst-case scenario of high pollutant concentrations discharging into the ocean after months of accumulating on the land, it is important to identify how sub-watersheds compare to each other and if they should be prioritized for follow up investigation during dry weather months. By coupling First Flush with the Dry Run and source tracking within each watershed, a better understanding of each watershed's specific characteristics and problem areas can be achieved, providing needed information for decision making and effective storm water programs.

Appendix 1: MRSWMP Monitoring sites

MRSWMP Monitoring sites- listed from north to south

| Jurisdiction | Site ID | Site Name | Drainage Area (acres) | Primary Land Use | MRSWMP Outfall # | Pipe ID (Inches) |
|---------------------|----------|------------------------|-----------------------|---|------------------|------------------------|
| Monterey County | SASD-01 | Boronda | 86 | 39% Residential 23% Cultivated 19% Industrial | MC-013 | 24" |
| Monterey County | SASD-02 | Las Palmas | 158 | 3% Commercial 31% Residential 60% Open space | MSP-025 | Box culvert |
| Seaside & Sand City | SSD-02 | Bay Street | 1200 | 80% Residential 10% Commercial 10% Public/Other | SC-1 | 90 |
| Monterey | MSD-03 | Twin 51's | 291 | 63% Residential 15% Commercial 22% Public/Other | M-15 | 51" (x2) |
| Monterey | MSD-04 | San Carlos | 22 | 12% Commercial 38% Residential 50% Public/Other | M-7 | 24" |
| Monterey | MSD-05 | Steinbeck | 37 | 66% Commercial 12% Residential 22% Public/Other | M-3 | 36" |
| Pacific Grove | PGSD-09 | HopkinsMon | 40.7 | 45% Residential 30% Commercial 25% Public Other | PG-41 | 30" |
| Pacific Grove | PGSD-08 | HopkinsPG | | | PG-40 | 24" |
| Pacific Grove | PGSD-01 | 8 th Street | 35 | 100% Residential | PG-32 | 24" |
| Pacific Grove | CENTR-31 | Greenwood Park | 238.3 | 71% Residential 5% Commercial 25% Public/Other | PG-28 | 36" |
| Pacific Grove | PGSD-03 | Lover's Point | 240 | 54% Residential 1% Commercial 20% Other | PG-22 | 54" |
| Pacific Grove | PGSD-04 | Pico | 17.56 | 60% Residential 40% Public | PG-03 | 40" |
| Carmel | CASD-01 | 4 th Avenue | 128.0 | 86% residential 7% Comm/Res 7% Public/Other | C-1 | 36"x60" Box culvert |
| Carmel | CASD-02 | Ocean Avenue | 115.2 | 22% Commercial 71% Residential 7% Comm/Res | C-2 | 24" |

Appendix 2: Results by Analyte (listed alphabetically)

Ammonia as N

Comparison of ammonia results for MRSWMP monitoring and reported in mg/L. Shaded boxes indicate that the General Permit Action Level of 50 mg/L was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring for this analyte. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|-----------------------|-----------------------|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|------------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 0.80 | NF | 0.45 | NF | 0.13 | NF | 0.84 | NF | 0.53 | NF | -- | -- | NF | NS | NS | NF | |
| | | Ocean | 0.95 | NF | 1.00 | NF | 0.65 | NF | 0.73 | NF | 0.59 | NF | -- | -- | NF | NS | NA | NF | |
| | | 8 th Avenue | NS | NS | 0.85 | NF | 0.71 | ND | 0.84 | NF | 0.73 | NF | -- | -- | NF | NS | NS | NA | |
| | Monterey | Twin 51's | 0.48 | 0.90 | 0.95 | ND | 0.92 | 0.9 | 0.32 | 0.44 | 0.69 | 0.34 | 0.72 | 0.07 | 0.06 | 0.10 | NA | NA | |
| | | San Carlos | 0.34 | NF | 0.25 | NF | 0.47 | NF | 0.26 | NF | 0.35 | NF | 0.86 | NF | NF | 0.14 | NA | NF | |
| | | Steinbeck | 0.89 | ND | 3.30 | NF | 4.63 | NF | 2.76 | NF | 3.79 | NF | 10.46 | 0.09 | 0.08 | 0.61 | NA | NF | |
| | Monterey County | Boronda | 0.37* | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 0.30 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 0.25 | NF | 0.51 | NF | 2.90 | NF | 0.31 | NF | 0.44 | NF | NF | 0.23 | NA | NF | |
| | | Crossroads | NS | NS | 0.35 | NF | 0.29 | NF | 0.18 | NF | 0.18 | NF | 0.46 | NF | NF | 0.12 | NA | NF | |
| | Pacific Grove | HopkinsMon | 0.47 | NF | 0.45 | NF | 0.98 | 1.1 | 0.33 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 1.22 | NF | 4.95 | NF | 0.45 | NF | 1.66 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8 th Street | 0.44 | NF | 0.70 | 0.30 | 0.41 | NF | 0.32 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 0.52 | 0.10 | 0.45 | 0.10 | 0.41 | ND | 0.36 | 0.26 | 0.78 | ND | 1.57 | 0.21 | 0.11 | NS | NA | NA | |
| | | Lover's | 0.55 | ND | 0.40 | NF | 0.39 | NF | 0.33 | NF | 0.49 | NF | 1.18 | NF | NF | NS | NA | NF | |
| | Pico | 0.70 | ND | 0.40 | ND | 0.29 | ND | 0.29 | ND | 0.68 | ND | 0.94 | ND | ND | 0.11 | NA | NA | | |
| | Seaside/ Sand City | Bay St | 0.71 | NF | 0.15 | NF | 0.93 | NF | 0.39 | NF | 0.53 | NF | 0.37 | NF | NF | 0.13 | NA | NF | |

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Color

Comparison of color results for MRSWMP monitoring, reported in Color Units. Shaded boxes indicate that the General Permit action level of 500 color units was exceeded. NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring of this analyte. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|-----------------------|-----------------------|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|------------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 550 | NF | 275 | NF | 375 | NF | 213 | NF | 400 | NF | -- | NF | NS | NS | NF | |
| | | Ocean | 175 | NF | 175 | NF | 250 | NF | 80 | NF | 73 | NF | -- | NF | NS | 300 | NF | |
| | | 8 th Avenue | NS | NS | 200 | NF | 225 | 14 | 100 | NF | 100 | NF | -- | NF | NS | NS | 7 | |
| | Monterey | Twin 51's | 188 | 75 | 100 | 20 | 250 | 19 | 40 | 24 | 85 | 30 | 185 | 30 | 50 | 225 | 24 | |
| | | San Carlos | 150 | NF | 98 | NF | 250 | NF | 44 | NF | 50 | NF | 315 | NF | 70 | 225 | NF | |
| | | Steinbeck | 125 | 375 | 110 | NF | 200 | NF | 75 | NF | 63 | NF | 340 | 33 | 70 | 225 | NF | |
| | Monterey County | Boronda | NA | NA | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 60 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 85 | NF | 1125 | NF | 255 | NF | 400 | NF | 300 | NF | 500 | 625 | NF | |
| | | Crossroads | NS | NS | 125 | NF | 300 | NF | 40 | NF | 20 | NF | 100 | NF | 70 | 75 | NF | |
| | Pacific Grove | HopkinsMon | 100 | NF | 125 | NF | 150 | 32 | 80 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 150 | NF | 125 | NF | 200 | NF | 80 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8 th Street | 85 | NF | 125 | 40 | 175 | NF | 50 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 125 | 50 | 125 | 50 | 250 | 10 | 60 | 30 | 100 | 25 | 315 | 20 | NS | 250 | 60 | |
| | | Lover's | 175 | 24 | 200 | NF | 175 | NF | 42 | NF | 75 | NF | 250 | NF | NS | 300 | NF | |
| | | Pico | 200 | 100 | 200 | 40 | 225 | 8 | 70 | 60 | 175 | 50 | 225 | 40 | 167 | 250 | 44 | |
| | Seaside/ Sand City | Bay St | 150 | NF | 18 | NF | 200 | NF | 60 | NF | 65 | NF | 305 | NF | 70 | 250 | NF | |

Copper

Comparison of total copper results for MRSWMP monitoring reported in µg/L. Shaded boxes indicate that the Basin Plan Objective of 30 µg/L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring.

Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 |
|-----------------------|-------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 71 | NF | 163 | NF | 46 | NF | 86 | NF | 73 | NF | -- | -- | NF | NS |
| | | Ocean | 84 | NF | 138 | NF | 111 | NF | 95 | NF | 58 | NF | -- | -- | NF | NS |
| | | 8 th Avenue | NS | NS | 139 | NF | 77 | 14 | 108 | NF | 86 | NF | -- | -- | NF | NS |
| | Monterey | Twin 51's | 26 | 23 | 24 | ND | 65 | 19 | 22 | 13 | 27 | 27 | 76 | 11 | ND | ND |
| | | San Carlos | 22 | NF | 58 | NF | 72 | NF | 21 | NF | 25 | NF | 121 | NF | NF | 24 |
| | | Steinbeck | 37 | 193 | 59 | NF | 499 | NF | 52 | NF | 39 | NF | 248 | 4 | ND | 21 |
| | Monterey County | Boronda | 16* | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 4 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 30 | NF | 79 | NF | 62 | NF | 27 | NF | 32 | NF | NF | 42 |
| | | Crossroads | NS | NS | 30 | NF | 15 | NF | 17 | NF | 10 | NF | 35 | NF | NF | ND |
| | Pacific Grove | HopkinsMon | 16 | NF | 34 | NF | 52 | 32 | 27 | NF | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 20 | NF | 40 | NF | 52 | NF | 32 | NF | -- | -- | -- | -- | -- | -- |
| | | 8 th Street | 24 | NF | 39 | ND | 43 | NF | 26 | NF | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 13 | 6 | 32 | ND | 41 | 10 | 16 | 4 | 22 | 8 | 58 | ND | ND | NS |
| | | Lover's | 24 | ND | 36 | NF | 47 | NF | 19 | NF | 24 | NF | 68 | NF | NF | NS |
| | | Pico | 22 | 7 | 55 | ND | 27 | 8 | 29 | 5 | 30 | ND | 61 | ND | ND | 28 |
| | Seaside/Sand City | Bay St | 40 | NF | ND | NF | 81 | NF | 28 | NF | 26 | NF | 106 | NF | NF | 21 |

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Copper continued

| | | Site Name | FF 2013 | DR 2013 | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 |
|-----------------------|-----------------------|------------------------|------------|------------|-------------|------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | NS | NF | NF | NS | 86 | NF | NF | NF | 96 | 11 | NF | 10 | 101 | NF |
| | | Ocean | 248 | NF | NF | NS | 87 | NF | 72 | NF | 165 | NF | NF | NF | 395 | NF |
| | | 8 th Avenue | NS | 6 | 14 | NS | NS | NF | 7 | 21 | 114 | 6 | 4 | 8 | 172 | 5 |
| | Monterey | Twin 51's | 75 | 16 | 13 | 16 | 46 | 10 | 16 | 8 | 52 | 9 | 5 | 11 | 99 | 12 |
| | | San Carlos | 86 | NF | 12 | -- | -- | NF | 14 | 13 | 65 | 8 | 4 | 8 | 124 | 26 |
| | | Steinbeck | 113 | NF | 12 | 37 | 147 | 6 | 31 | 20 | 77 | 9 | 8 | 18 | 352 | 15 |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | 51 | NF | NF | 32 | 44 | NF | NF | NF | 28 | NF | NF | NF | 73 | NF |
| | | Crossroads | 18 | NF | NF | 7 | 40 | NF | NF | NF | 11 | NF | NF | NF | 55 | NF |
| | Pacific Grove | HopkinsMon | -- | -- | 25 | NS | NS | NS | 22 | NS | 27 | NF | 9 | 16 | 72 | 18 |
| | | HopkinsPG | -- | -- | NF | NS | NS | NS | NF | NS | 35 | NF | NF | NF | 176 | NF |
| | | 8 th Street | -- | -- | NF | NS | NS | NF | NF | 11 | NF | NF | 17 | 13 | 64 | 134 |
| | | Greenwood | 52 | 6 | ND | NS | 24 | ND | 8 | 12 | 38 | 10 | 17 | 13 | 56 | 5 |
| | | Lover's | 92 | NF | NF | NS | 36 | NF | NF | 9 | 40 | NF | 4 | 10 | 14 | 5 |
| | | Pico | 75 | 6 | 7 | 26 | 28 | ND | 10 | 11 | 43 | 6 | ND | 10 | 62 | 7 |
| | Seaside/ Sand City | Bay St | 88 | NF | NF | 48 | 28 | NF | NF | NF | 52 | NF | NF | 4 | 65 | NF |

Copper continued

| | | Site Name | SuR 2010 | SpR 2010 | FF 2009 | DR 2009 | FF 2008 | DR 2008 | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|-----------------------|-----------------------|------------------------|-------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | Ocean | 69 | NF | 184 | NF | 148 | NF | 212 | NF | -- | -- |
| | | 8 th Avenue | 7 | 5 | 166 | ND | 170 | 6 | 148 | 14 | -- | -- |
| | | 4 th Avenue | NF | NF | 183 | NF | 53 | NF | 152 | NF | -- | -- |
| | Monterey | Twin 51's | 20 | 6 | 78 | 11 | 69 | 7 | 60 | 5 | 92 | ND |
| | | San Carlos | 10 | 7 | 77 | 16 | 84 | 18 | 73 | 11 | 139 | ND |
| | | Steinbeck | 12 | 10 | 148 | 6 | 126 | 185 | 83 | 17 | 125 | ND |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | NF | 44 | 9 | 93 | NF | -- | -- | -- | -- |
| | | Crossroads | NF | NF | 44 | NF | -- | -- | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 24 | 25 | 79 | 86 | 49 | 54 | 57 | NF | 89 | NF |
| | | HopkinsPG | NF | NF | 77 | NF | 63 | NF | 47 | NF | -- | -- |
| | | 8 th Street | NF | NF | 59 | NF | 49 | NF | 55 | NF | 49 | NF |
| | | Greenwood | 9 | 25 | 44 | 6 | 44 | 17 | 46 | 3 | 41 | ND |
| | | Lover's | 5 | 7 | 54 | ND | 51 | 4 | 48 | ND | 57 | NF |
| | | Pico | 11 | 9 | 45 | 5 | 37 | 12 | 44 | ND | 33 | ND |
| | Seaside/ Sand City | Bay St | NF | NF | 126 | NF | 42 | NF | 50 | NF | ND | NF |

E. coli

Comparison of *E. coli* results for MRSWMP monitoring reported in MPN/ 100 ml. Shaded boxes indicate that the EPA Water Quality Objective of 235 MPN/ 100 ml was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|------------------------------|-----------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 33200 | NF | 40029 | NF | 49134 | NF | 38799 | NF | 46181 | NF | -- | -- | NF | NS | NS | NF | |
| | | Ocean | 16700 | NF | 70778 | NF | 27508 | NF | 23084 | NF | 32817 | NF | -- | -- | NF | NS | 16250 | NF | |
| | | 8 th Avenue | NS | NS | 41370 | NF | 9462 | 13200 | 15252 | NF | 43788 | NF | -- | -- | NF | NS | NS | <20 | |
| | Monterey | Twin 51's | 59850 | 8164 | 56879 | 1223 | 9267 | 1610 | 42755 | 141361 | 53713 | 198629 | 60200 | 6152 | 3106 | 9208 | 67265 | 4978 | |
| | | San Carlos | 5630 | NF | 39043 | NF | 10148 | NF | 8044 | NF | 13973 | NF | 138000 | NF | NF | 4106 | 3475 | NF | |
| | | Steinbeck | 17700 | 3578 | 17915 | NF | 20999 | NF | 27860 | NF | 25024 | NF | 65300 | 3836 | 196 | 21870 | 88662 | NF | |
| | Monterey County | Boronda | 5730 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 17300 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 142739 | NF | 15112 | NF | 20660 | NF | 4693 | NF | 7617 | NF | NF | 860 | 3163 | NF | |
| | | Crossroads | NS | NS | 26180 | NF | 743 | NF | 2020 | NF | 14265 | NF | 94500 | NF | NF | 703 | 1095 | NF | |
| | Pacific Grove | HopkinsMon | 12300 | NF | 36806 | NF | 25589 | 242000 | 12246 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 7305 | NF | 24422 | NF | 29093 | NF | 36606 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8 th Street | 32600 | NF | 26491 | >24196 | 33673 | NF | 12885 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 23400 | 8664 | 45590 | 24196 | 146841 | 2920 | 19105 | 1153 | 41922 | 28272 | 36590 | 6152 | 5510 | NS | 19585 | 39726 | |
| | | Lover's | 32750 | 17407 | 42692 | NF | 8712 | NF | 14634 | NF | 28761 | NF | 60200 | NF | NF | NS | 30745 | NF | |
| | | Pico | 42400 | 900 | 191660 | 52 | 7121 | 880 | 35076 | 30 | 25572 | <20 | 42603 | 402 | 2092 | 4884 | 58030 | 244 | |
| | Seaside/ Sand City | Bay St | 26950 | NF | 20679 | NF | 72839 | NF | 21026 | NF | 38969 | NF | 94500 | NF | NF | 6488 | 148335 | NF | |

*Data provided by Monterey County from sampling that occurred one day after First Flush.

E. coli continued

| | | Site Name | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 | SuR 2010 | SpR 2010 |
|------------------------------|-----------------------|------------------------|----------|---------|---------|---------|----------|----------|---------|---------|----------|----------|---------|---------|----------|----------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | NF | NS | 45645 | NF | NF | NF | 105013 | <20 | NF | 126 | 22400 | NF | NF | NF |
| | | Ocean | NF | NS | 28322 | NF | 1918 | NF | 41525 | NF | NF | NF | 9950 | NF | 10950 | NF |
| | | 8 th Avenue | 82 | NS | NS | NF | <20 | 20 | 167021 | 12263 | 104 | 20 | 38450 | 520 | 20 | 20 |
| | Monterey | Twin 51's | 2878 | 4962 | 72294 | 296 | 2289 | 17329 | 65081 | 7746 | 6152 | 19608 | 61300 | 13340 | 48384 | 12263 |
| | | San Carlos | 5206 | NS | NS | NF | 20 | 20 | 41525 | 20 | 40 | 20 | 40400 | 13734 | 244 | 149 |
| | | Steinbeck | 34658 | 241960 | 130847 | 2500 | 653 | 218 | 241960 | 6511 | 194 | 126 | 145400 | 1974 | 398 | 220 |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | 618 | 8766 | NF | NF | NF | 16075 | NF | NF | NF | 2050 | NF | NF | NF |
| | | Crossroads | NF | 296 | 76395 | NF | NF | NF | 44059 | NF | NF | NF | 25950 | NF | NF | NF |
| | Pacific Grove | HopkinsMon | 3316 | NS | NS | NS | 169 | NS | 39726 | NF | 20 | 3912 | 29650 | 104 | 20 | 3912 |
| | | HopkinsPG | NF | NS | NS | NS | NF | NS | 207625 | NF | NF | NF | 40300 | NF | NF | NF |
| | | 8 th Street | NF | NS | NS | NF | NF | 456 | NF | NF | NF | 456 | 20976 | 39726 | 4283 | 6511 |
| | | Greenwood | 1980 | NS | 35076 | 31062 | 6511 | 1253 | 116644 | 6896 | 12976 | 10950 | 32700 | 1814 | 8212 | 2966 |
| | | Lover's | NF | NS | 42288 | NF | NF | 5510 | 48391 | NF | 6152 | 220 | 3807 | 82 | 82 | 3870 |
| | | Pico | 40 | 3214 | 37769 | 1720 | 20 | 40 | 32860 | 2802 | 80 | 61 | 15050 | 410 | 40 | 148 |
| | Seaside/ Sand City | Bay St | NF | 241960 | 43518 | NF | NF | NF | 44059 | NF | NF | 672 | 64900 | NF | NF | NF |

E. coli continued

| | | Site Name | FF 2009 | DR 2009 | FF 2008 | DR 2008 | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|------------------------------|-----------------------|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 73916 | NF | 11413 | NF | 49590 | NF | -- | -- |
| | | Ocean | 34658 | NF | 9214 | NF | 43374 | NF | -- | -- |
| | | 8 th Avenue | NA | 80 | 36119 | 126 | 59067 | 82 | -- | -- |
| | Monterey | Twin 51's | 229170 | 296 | 83819 | 6150 | 165301 | 25993 | 185536 | 50 |
| | | San Carlos | 8770 | 8212 | 17484 | 40 | 16304 | 218 | 14749 | 798 |
| | | Steinbeck | 90824 | 4494 | 112738 | 48400 | 40925 | 9768 | 158848 | 2602 |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | 4681 | 40 | 15186 | NF | -- | -- | -- | -- |
| | | Crossroads | NA | NF | -- | -- | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 19735 | 48392 | 3741 | 312 | 82782 | NF | 196179 | NF |
| | | HopkinsPG | 25994 | NF | 27742 | NF | 27742 | NF | -- | -- |
| | | 8 th Street | 77979 | NF | 26485 | NF | 14636 | NF | 50978 | -- |
| | | Greenwood | 44059 | 1976 | 31528 | 13000 | 16767 | 11588 | 73322 | 20529 |
| | | Lover's | 34659 | 170 | 24916 | 1390 | 60214 | 48384 | 172534 | NF |
| | | Pico | 17063 | 104 | 204626 | 3840 | 155639 | 5818 | 43926 | 606 |
| | Seaside/ Sand City | Bay St | 34162 | NF | 20277 | NF | 46464 | NF | 856 | NF |

Enterococcus

Comparison of enterococcus results for MRSWMP monitoring reported in MPN/ 100 ml. Shaded boxes indicate that the EPA Water Quality Objective of 104 MPN/ 100 ml was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|-----------------------|-----------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 18745 | NF | 27521 | NF | 24825 | NF | 7039 | NF | 22801 | NF | -- | -- | NF | NS | NS | NF | |
| | | Ocean | 15895 | NF | 55079 | NF | 13744 | NF | 11051 | NF | 14901 | NF | -- | -- | NF | NS | 9665 | NF | |
| | | 8 th Avenue | NS | NS | 44622 | NF | 11072 | 5480 | 7607 | NF | 25451 | NF | -- | -- | NF | NS | NS | 104 | |
| | Monterey | Twin 51's | 56880 | 723 | 20948 | 697 | 13590 | 74 | 14298 | 1470 | 25867 | 7746 | 37150 | 1417 | 1760 | 8164 | 21000 | 22398 | |
| | | San Carlos | 10120 | NF | 8786 | NF | 10884 | NF | 7921 | NF | 18471 | NF | 79650 | NF | NF | 8164 | 4825 | NF | |
| | | Steinbeck | 15655 | 2320 | 54175 | NF | 43561 | NF | 13667 | NF | 56518 | NF | 54200 | 4962 | 270 | 34480 | 88662 | NF | |
| | Monterey County | Boronda | NS | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 2845 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 33127 | NF | 55711 | NF | 25545 | NF | 12311 | NF | 20013 | NF | NF | 7541 | 3163 | NF | |
| | | Crossroads | NS | NS | 37762 | NF | 4892 | NF | 2607 | NF | 8083 | NF | 1530 | NF | NF | 1434 | 1095 | NF | |
| | Pacific Grove | HopkinsMon | 10460 | NF | 37138 | NF | 14088 | 300 | 19241 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 8560 | NF | 46308 | NF | 21426 | NF | 18168 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8 th St | 18215 | NF | 54750 | 2755 | 76523 | NF | 8704 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 17035 | 5172 | 109490 | 15531 | 102024 | 11200 | 16001 | 40 | 40794 | 20925 | 41950 | 4374 | 2290 | NS | 20880 | 8704 | |
| | | Lover's | 15340 | 20925 | 46662 | NF | 17090 | NF | 18572 | NF | 119844 | NF | 20768 | NF | NF | NS | 127750 | NF | |
| | | Pico | 19245 | 928 | 169995 | 31 | 7980 | 328 | 13415 | 416 | 29926 | <20 | 23118 | 83 | 3978 | 15650 | 9005 | 322 | |
| | Seaside/ Sand City | Bay St | 20050 | NF | 39564 | NF | 70697 | NF | 18458 | NF | 17265 | NF | 126500 | NF | NF | 17329 | 23415 | NF | |

Enterococcus continued

| | | Site Name | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 | SuR 2010 | SpR 2010 | FF 2009 | DR 2009 | |
|-----------------------|-------------------|------------------------|----------|---------|---------|---------|----------|----------|---------|---------|----------|----------|---------|---------|----------|----------|---------|---------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | NF | NS | 14554 | NF | NF | NF | 176971 | 20 | NF | 20 | 21650 | NF | NF | NF | 40438 | NF | |
| | | Ocean | NF | NS | 55607 | NF | 17329 | NF | 41125 | NF | NF | NF | 33900 | NF | 81640 | NF | 48392 | NF | |
| | | 8 th Avenue | 974 | NS | NS | NF | 20 | 20 | 84547 | 4564 | 82 | 187 | 43700 | 100 | 40 | 40 | NA | 220 | |
| | Monterey | Twin 51's | 942 | 6896 | 79326 | 492 | 431 | 1587 | 67477 | 346 | 5819 | 2306 | 108150 | 970 | 498 | 2669 | 111501 | 125 | |
| | | San Carlos | 374 | NS | NS | NF | 20 | 313 | 48391 | 346 | 40 | 146 | 34450 | 4196 | 9768 | 1918 | 38751 | 531 | |
| | | Steinbeck | 48392 | 43517 | 241957 | 1587 | 16328 | 4494 | 241957 | 16328 | 2184 | 393 | 12100 | 3232 | 976 | 1249 | 241960 | 16328 | |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | 6260 | 92342 | NF | NF | NF | 80189 | NF | NF | NF | 339000 | NF | NF | NF | 51797 | 6339 | |
| | | Crossroads | NF | 559 | 241960 | NF | NF | NF | 116723 | NF | NF | NF | 60200 | NF | NF | NF | NA | NF | |
| | Pacific Grove | HopkinsMon | 12976 | NS | NS | NS | 242 | NS | 63725 | NF | 747 | 700 | 38000 | 148 | 172 | 917 | 47619 | 48291 | |
| | | HopkinsPG | NF | NS | NS | NS | NF | NS | 241957 | NF | NF | NF | 116000 | NF | NF | NF | 157330 | NF | |
| | | 8th St | NF | NS | NS | NF | NF | 218 | NF | NF | 12976 | 242 | 85350 | 10950 | NF | NF | 95062 | NF | |
| | | Greenwood | 1226 | NS | 81461 | 14540 | 25993 | 1024 | 173291 | 8703 | 13733 | 1625 | 75150 | 1918 | 2792 | 1188 | 111501 | 3571 | |
| | | Lover's | NF | NS | 95634 | NF | NF | 1352 | 116644 | NF | 3571 | 521 | 15372 | 82 | 104 | 10950 | 88435 | 104 | |
| | | Pico | 746 | 7308 | 70697 | 583 | 40 | 61 | 101332 | 126 | 20 | 20 | 33550 | 1210 | 512 | 220 | 33310 | 583 | |
| | Seaside/Sand City | Bay St | NF | 12229 | 82392 | NF | NF | NF | 47396 | NF | NF | 20 | 70700 | NF | NF | NF | 90327 | NF | |

Enterococcus continued

| | | Site Name | FF 2008 | DR 2008 | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|------------------------------|--------------------|------------------------|------------|------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 25567 | NF | 3328 | NF | -- | -- |
| | | Ocean | 100120 | NF | 3381 | NF | -- | -- |
| | | 8 th Avenue | 36000 | 942 | 6168 | 436 | -- | -- |
| | Monterey | Twin 51's | 139002 | 8700 | 57609 | 39726 | 227516 | -- |
| | | San Carlos | 67560 | 62 | 25993 | 20 | 63487 | -- |
| | | Steinbeck | 193983 | 48400 | 112902 | 14540 | 241960 | -- |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- |
| | | Pajaro | 100612 | NF | -- | -- | -- | -- |
| | | Crossroads | -- | -- | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 31828 | 292 | 91787 | NF | -- | -- |
| | | HopkinsPG | 84778 | NF | 16523 | NF | -- | -- |
| | | 8th St | 75211 | NF | 29202 | NF | 66298 | -- |
| | | Greenwood | 76803 | 5820 | 29372 | 17382 | 62567 | -- |
| | | Lover's | 87231 | 4130 | 39739 | 18416 | 99442 | -- |
| | | Pico | 155638 | 8210 | 81652 | 1760 | 43965 | -- |
| Seaside/ Sand City | Bay St | 13650 | NF | 13435 | NF | 341 | -- | |

Hardness

Comparison of hardness results for MRSWMP monitoring reported in mg/L. Shaded boxes indicate that the General Permit Action Level of less than or equal to 10 mg/L or greater than or equal to 2000 mg/L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 |
|-----------------------|-----------------------|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 83 | NF | 90 | NF | 36 | NF | 58 | NF | 44 | NF | -- | -- | NF | NS | NS | NF |
| | | Ocean | 32 | NF | 68 | NF | 36 | NF | 25 | NF | 25 | NF | -- | -- | NF | NS | 105 | NF |
| | | 8 th Avenue | NS | NS | 106 | NF | 38 | 326 | 40 | NF | 40 | NF | -- | -- | NF | NS | NS | 277 |
| | Monterey | Twin 51's | 63 | 347 | 57 | 699 | 55 | 429 | 39 | 905 | 53 | 248 | 93 | 910 | 682 | 19 | 119 | 360 |
| | | San Carlos | 27 | NF | 53 | NF | 64 | NF | 32 | NF | 34 | NF | 57 | NF | NF | 23 | 100 | NF |
| | | Steinbeck | 29 | 142 | 39 | NF | 64 | NF | 33 | NF | 29 | NF | 47 | 224 | 281 | 17 | 52 | NF |
| | Monterey County | Boronda | 76* | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 40 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 40 | NF | 103 | NF | 101 | NF | 41 | NF | 45 | NF | NF | 50 | 102 | NF |
| | | Crossroads | NS | NS | 29 | NF | 14 | NF | 20 | NF | 9 | NF | 18 | NF | NF | 9 | 28 | NF |
| | Pacific Grove | HopkinsMon | 35 | NF | 53 | NF | 54 | 626 | 51 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 51 | NF | 63 | NF | 43 | NF | 42 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8 th Street | 36 | NF | 57 | 373 | 102 | NF | 31 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 36 | 330 | 55 | 400 | 46 | 456 | 23 | 376 | 35 | 298 | 45 | 314 | 289 | NS | 114 | 341 |
| | | Lover's | 49 | 365 | 66 | NF | 57 | NF | 31 | NF | 20 | NF | 48 | NF | NF | NS | 135 | NF |
| | | Pico | 54 | 172 | 51 | 179 | 39 | 223 | 36 | 179 | 62 | 161 | 60 | 161 | 192 | 18 | 75 | 163 |
| | Seaside/ Sand City | Bay St | 35 | NF | 5970 | NF | 922 | NF | 23 | NF | 28 | NF | 48 | NF | NF | 21 | 120 | NF |

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Lead

Comparison of total lead results for MRSWMP monitoring reported in µg/L. Shaded boxes indicate that the Basin Plan Objective of 30 µg/L was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 |
|-----------------------|-------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 28 | NF | 15 | NF | 10 | NF | 24 | NF | 32 | NF | -- | -- | NF | NS | NS | NF |
| | | Ocean | 5 | NF | 5 | NF | 6 | NF | ND | NF | 11 | NF | -- | -- | NF | NS | 9 | NF |
| | | 8 th Avenue | NS | NS | 11 | NF | 9 | 1 | 9 | NF | 28 | NF | -- | -- | NF | NS | NS | ND |
| | Monterey | Twin 51's | 24 | 1 | 12 | 0.3 | 15 | ND | 15 | ND | 15 | ND | 12 | ND | ND | ND | 31 | ND |
| | | San Carlos | 14 | NF | 8 | NF | 8 | NF | ND | NF | 5 | NF | 23 | NF | NF | 10 | 8 | NF |
| | | Steinbeck | 20 | 2 | 9 | NF | 5 | NF | ND | NF | ND | NF | 15 | ND | ND | 8 | ND | NF |
| | Monterey County | Boronda | NS | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 3 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 7 | NF | 32 | NF | 14 | NF | 16 | NF | 14 | NF | NF | 24 | 16 | NF |
| | | Crossroads | NS | NS | ND | NF | 1 | NF | ND | NF | ND | NF | ND | NF | NF | 31 | ND | NF |
| | Pacific Grove | HopkinsMon | 6 | NF | 5 | NF | 8 | 2 | ND | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 10 | NF | 3 | NF | 6 | NF | ND | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8th St | 19 | NF | 5 | 0.5 | 9 | NF | ND | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 8 | 1 | 7 | ND | 15 | ND | ND | ND | 9 | ND | 11 | ND | ND | NS | 8 | ND |
| | | Lover's | 11 | ND | 4 | NF | 6 | NF | 4 | NF | 6 | NF | 11 | NF | NF | NS | 6 | NF |
| | | Pico | 14 | 1 | 2 | 0.2 | 6 | ND | ND | ND | 5 | ND | ND | ND | 17 | 8 | 6 | ND |
| | Seaside/Sand City | Bay St | 18 | NF | ND | NF | 11 | NF | 8 | NF | 7 | NF | 44 | NF | NF | 10 | 20 | NF |

Lead Continued

| | | Site Name | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 | SuR 2010 | SpR 2010 | FF 2009 | DR 2009 | FF 2008 | DR 2008 | |
|-----------------------|-----------------------|------------------------|-------------|------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|------------|------------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | NF | NS | 23 | NF | NF | NF | 60 | ND | NF | ND | 22 | NF | NF | NF | 25 | NF | 15 | NF | |
| | | Ocean | NF | NS | 11 | NF | ND | NF | 26 | NF | NF | NF | 8 | NF | 5 | NF | ND | NF | 6 | NF | |
| | | 8 th Avenue | ND | NS | NS | NF | ND | ND | 19 | ND | ND | ND | 11 | ND | ND | ND | 9 | ND | 6 | 5 | |
| | Monterey | Twin 51's | ND | ND | 23 | ND | ND | ND | ND | ND | ND | ND | 44 | ND | ND | ND | 8 | ND | 17 | 5 | |
| | | San Carlos | ND | NS | NS | NF | ND | ND | 22 | ND | ND | ND | 22 | 1 | ND | ND | 6 | ND | 6 | 5 | |
| | | Steinbeck | ND | ND | 7 | ND | ND | ND | 13 | ND | ND | ND | 9 | 1 | ND | ND | 7 | ND | 6 | 5 | |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | 22 | 20 | NF | NF | NF | 17 | NF | NF | NF | 34 | NF | NF | NF | 24 | ND | 63 | NF | |
| | | Crossroads | NF | ND | ND | NF | NF | NF | ND | NF | NF | NF | ND | NF | NF | NF | ND | -- | -- | -- | |
| | Pacific Grove | HopkinsMon | ND | NS | NS | NA | ND | NS | 14 | NF | ND | ND | 9 | ND | ND | ND | 21 | 10 | 7 | 5 | |
| | | HopkinsPG | NF | NS | NS | NF | NF | NS | 13 | NF | NF | NF | 11 | NF | NF | NF | 7 | NF | ND | NF | |
| | | 8th St | NF | NS | NS | NF | NF | ND | NF | NF | 6 | ND | 8 | 83 | NF | NF | 14 | NF | ND | NF | |
| | | Greenwood | ND | NS | 4 | ND | ND | ND | 20 | ND | ND | ND | 11 | ND | ND | ND | 6 | ND | 6 | 5 | |
| | | Lover's | NF | NS | 6 | NF | NF | ND | 30 | NF | ND | ND | 3 | ND | ND | ND | 10 | ND | 7 | 5 | |
| | | Pico | ND | ND | ND | ND | ND | ND | 7 | ND | ND | ND | 6 | ND | ND | ND | ND | ND | 8 | 5 | |
| | Seaside/ Sand City | Bay St | NF | 9 | 8 | NF | NF | NF | 16 | NF | NF | ND | 28 | NF | NF | NF | 33 | NF | 14 | NF | |

Lead Continued

| | | Site Name | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|-----------------------|-----------------------|------------------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 18 | NF | -- | -- |
| | | Ocean | 47 | NF | -- | -- |
| | | 8 th Avenue | 13 | 5 | -- | -- |
| | Monterey | Twin 51's | 36 | 5 | 13 | ND |
| | | San Carlos | 18 | 5 | 11 | ND |
| | | Steinbeck | 22 | 5 | 7 | ND |
| | Monterey County | Boronda | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- |
| | | Pajaro | -- | -- | -- | -- |
| | | Crossroads | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 9 | NF | 10 | NF |
| | | HopkinsPG | 15 | NF | -- | -- |
| | | 8th St | 12 | NF | 12 | NF |
| | | Greenwood | 18 | 5 | 8 | ND |
| | | Lover's | 16 | 5 | 9 | NF |
| | | Pico | 12 | 5 | 5 | ND |
| | Seaside/ Sand City | Bay St | 15 | NF | ND | NF |

MBAS Detergents

Comparison of MBAS surfactant results for MRSWMP monitoring reported in mg/L. Shaded boxes indicate that the Basin Plan Water Quality Objective of 0.2 mg/L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|-----------------------|-------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 0.46 | NF | 0.48 | NF | 1.20 | NF | 0.37 | NF | 0.30 | NF | -- | -- | NF | NS | NS | NF | |
| | | Ocean | 0.58 | NF | 0.68 | NF | 0.80 | NF | 0.45 | NF | 0.26 | NF | -- | -- | NF | NS | 1.6 | NF | |
| | | 8 th Avenue | NS | NS | 0.92 | NF | 0.99 | 0.14 | 0.50 | NF | 0.33 | NF | -- | -- | NF | NS | NS | ND | |
| | Monterey | Twin 51's | 0.26 | 0.21 | 0.42 | 0.16 | 1.51 | 0.16 | 0.33 | 0.14 | 0.33 | 1.06 | 0.55 | 0.08 | 0.1 | ND | 0.31 | 0.05 | |
| | | San Carlos | 0.29 | NF | 0.55 | NF | 1.54 | NF | 0.33 | NF | 0.29 | NF | 0.94 | NF | NF | ND | 1.04 | NF | |
| | | Steinbeck | 0.43 | 0.26 | 0.48 | NF | 0.71 | NF | 0.43 | NF | 0.36 | NF | 0.53 | 0.16 | 0.06 | ND | 0.42 | NF | |
| | Monterey County | Boronda | NS | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 0.26 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 0.23 | NF | 0.44 | NF | 0.77 | NF | 0.21 | NF | 0.52 | NF | NF | ND | 1.12 | NF | |
| | | Crossroads | NS | NS | 0.86 | NF | 0.47 | NF | 0.55 | NF | 0.22 | NF | 0.39 | NF | NF | ND | 0.43 | NF | |
| | Pacific Grove | HopkinsMon | 0.50 | NF | 0.55 | NF | 1.12 | 0.59 | 0.50 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 0.52 | NF | 0.61 | NF | 1.08 | NF | 0.51 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8 th Street | 0.36 | NF | 0.56 | 0.16 | 1.10 | NF | 0.43 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 0.37 | 0.14 | 0.40 | 0.09 | 0.99 | 0.09 | 0.38 | 0.08 | 0.32 | 0.95 | 0.84 | 0.27 | ND | NS | 0.52 | ND | |
| | | Lover's | 0.54 | 0.06 | 0.46 | NF | 0.60 | NF | 0.38 | NF | 0.25 | NF | 1.30 | NF | NF | NS | 0.65 | NF | |
| | | Pico | 0.53 | 0.15 | 0.39 | 0.08 | 0.51 | 0.08 | 0.43 | 0.08 | 0.51 | 0.14 | 1.00 | ND | 0.06 | ND | 0.55 | 0.06 | |
| | Seaside/Sand City | Bay St | 0.47 | NF | 0.17 | NF | 1.13 | NF | 0.51 | NF | 0.30 | NF | 0.77 | NF | NF | ND | 1.44 | NF | |

Nitrate as N

Comparison of nitrate as N (NO₃-N) results for 2006-2014 MRSWMP monitoring reported in mg-N/ L. Shaded boxes indicate that the Basin Plan Objective of 2.25 mg-N/ L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 |
|-----------------------|-------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 1.05 | NF | 0.55 | NF | 0.15 | NF | 0.5 | NF | 0.60 | NF | -- | -- | NF | NS | NS | NF |
| | | Ocean | 0.50 | NF | 0.65 | NF | 0.66 | NF | 0.3 | NF | 0.45 | NF | -- | -- | NF | NS | 1.8 | NF |
| | | 8 th Avenue | NS | NS | 0.55 | NF | 0.72 | ND | 0.3 | NF | 0.55 | NF | -- | -- | NF | NS | NS | 2.2 |
| | Monterey | Twin 51's | 0.60 | 0.60 | 0.30 | 0.5 | 0.66 | 0.5 | 0.3 | 0.40 | 0.45 | 1.5 | 0.7 | 0.3 | 0.3 | 0.2 | 0.7 | 0.8 |
| | | San Carlos | 0.50 | NF | 0.50 | NF | 0.53 | NF | 0.3 | NF | 0.30 | NF | 0.6 | NF | NF | 0.2 | 0.9 | NF |
| | | Steinbeck | 0.45 | 6.40 | 0.50 | NF | 2.78 | NF | 0.5 | 1.10 | 0.55 | NF | 1.1 | 0.4 | 1.7 | 0.2 | 1.3 | NF |
| | Monterey County | Boronda | 0.2* | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 0.45 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 0.45 | NF | 0.53 | NF | 0.9 | NF | 0.35 | NF | 0.5 | NF | NF | 0.2 | 1.2 | NF |
| | | Crossroads | NS | NS | 0.15 | NF | 0.30 | NF | 0.2 | NF | 0.20 | NF | 0.3 | NF | NF | ND | 0.5 | NF |
| | Pacific Grove | HopkinsMon | 0.40 | NF | 0.35 | NF | 0.59 | 0.5 | 0.4 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 1.15 | NF | 1.45 | NF | 0.53 | NF | 0.9 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8th St | 0.45 | NF | 0.45 | 2.6 | 0.41 | NF | 0.4 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 0.60 | 0.70 | 0.35 | 1.0 | 0.37 | 1.1 | 0.2 | NF | 0.45 | 1.4 | 0.7 | 0.9 | 0.8 | NS | 1.0 | 1.0 |
| | | Lover's | 0.55 | 0.60 | 0.40 | NF | 0.47 | NF | 0.2 | NF | 0.25 | NF | 0.7 | NF | NF | NS | 1.0 | NF |
| | | Pico | 0.55 | 0.80 | 0.25 | 1.0 | 0.39 | 0.9 | 0.2 | 0.90 | 0.35 | 0.9 | 0.7 | 2.4 | 1.9 | ND | 0.6 | 2.2 |
| | Seaside/Sand City | Bay St | 0.60 | NF | 1.15 | NF | 0.83 | NF | 0.3 | NF | 0.45 | NF | 0.4 | NF | NF | 0.2 | 1.4 | NF |

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Nitrate as N continued

| | | Site Name | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 | SuR 2010 | SpR 2010 | FF 2009 | DR 2009 | |
|------------------------------|-----------------------|------------------------|----------|---------|---------|---------|----------|----------|---------|---------|----------|----------|---------|---------|----------|----------|---------|---------|------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | NF | NS | 0.43 | NF | NF | NF | 0.33 | 0.08 | NF | 0.43 | 1.07 | NF | NF | NF | 0.60 | NF | |
| | | Ocean | NF | NS | 0.51 | NF | ND | NF | 0.20 | NF | NF | NF | 1.58 | NF | 0.03 | NF | 0.20 | NF | |
| | | 8 th Avenue | 2.5 | NS | NS | NF | 4.31 | 3.36 | 0.31 | 3.19 | 2.73 | 2.64 | 1.94 | 2.92 | 3.60 | 3.63 | 0.20 | 2.60 | |
| | Monterey | Twin 51's | ND | 0.2 | 0.44 | 0.73 | 0.39 | 0.1 | 0.46 | 0.7 | 0.47 | 0.39 | 1.1 | 0.98 | 1.30 | 0.20 | 0.40 | 0.40 | |
| | | San Carlos | 1.6 | NS | NS | NF | 0.8 | 1.43 | 0.12 | 0.83 | 0.41 | 1.18 | 0.81 | 2.84 | 1.20 | 0.64 | 0.50 | 1.20 | |
| | | Steinbeck | 3.6 | 0.6 | 2.67 | 0.78 | 2.45 | 2.97 | 0.28 | ND | 2.92 | 4.81 | 1.96 | 1.39 | 1.20 | 5.15 | 0.70 | ND | |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | 0.6 | 0.47 | NF | NF | NF | 0.39 | NF | NF | NF | 1.12 | NF | NF | NF | NF | 0.60 | 0.60 |
| | | Crossroads | NF | 0.05 | 0.59 | NF | NF | NF | 0.11 | NF | NF | NF | 0.81 | NF | NF | NF | NF | 0.30 | NF |
| | Pacific Grove | HopkinsMon | 1.2 | NS | NS | NS | 1.29 | NS | 0.20 | NF | 1.25 | 1.76 | 1.5 | 1.35 | 1.30 | 1.80 | 0.50 | 1.40 | |
| | | HopkinsPG | NF | NS | NS | NF | NF | NS | 0.31 | NF | NF | NF | 4.38 | NF | NF | NF | 2.70 | NF | |
| | | 8th St | NF | NS | NS | NF | NF | 0.95 | NF | NF | 1.83 | 1.05 | 0.87 | 1.99 | NF | NF | 0.80 | NF | |
| | | Greenwood | 1.4 | NS | 0.79 | 2.09 | 1.01 | 1.07 | 0.13 | 1.54 | 1.05 | 0.93 | 0.9 | 1.47 | 1.30 | 1.35 | 0.60 | 1.10 | |
| | | Lover's | NF | NS | 0.59 | NF | NF | 1.06 | 0.12 | NF | 0.31 | 0.73 | 0.12 | 3.54 | 2.30 | 0.74 | 0.60 | 4.80 | |
| | | Pico | 1.7 | 0.3 | 1.13 | 1.91 | 1.55 | 1.09 | 0.1 | 1.12 | 0.65 | 0.92 | 0.81 | 0.82 | 0.90 | 0.76 | 0.60 | 1.00 | |
| | Seaside/ Sand City | Bay St | NF | 1.0 | 0.74 | NF | NF | NF | 0.22 | NF | NF | 11.64 | 0.7 | NF | NF | NF | 0.40 | NF | |

Nitrate as N continued

| | | Site Name | FF 2008 | DR 2008 | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|------------------------------|--------------------|------------------------|------------|------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 0.77 | NF | 0.73 | NF | -- | -- |
| | | Ocean | 1.07 | NF | 0.71 | NF | -- | -- |
| | | 8 th Avenue | 1.40 | 0.10 | 0.91 | 2.17 | -- | -- |
| | Monterey | Twin 51's | 0.90 | 0.60 | 0.99 | 0.32 | 0.45 | 0.16 |
| | | San Carlos | 0.87 | 1.20 | 0.64 | 2.17 | 1.69 | 3.92 |
| | | Steinbeck | 1.10 | 0.10 | 0.79 | 1.07 | 1.72 | 4.71 |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- |
| | | Pajaro | 2.90 | NF | -- | -- | -- | -- |
| | | Crossroads | -- | -- | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 0.87 | 0.70 | 1.59 | NF | 1.39 | NF |
| | | HopkinsPG | 1.87 | NF | 0.60 | NF | -- | -- |
| | | 8th St | 1.10 | NF | 0.48 | NF | 0.79 | NF |
| | | Greenwood | 0.97 | 1.90 | 0.66 | 3.00 | 0.78 | 2.17 |
| | | Lover's | 0.87 | 4.80 | 0.56 | 0.86 | 0.68 | NF |
| | | Pico | 0.83 | 1.50 | 0.54 | 2.04 | 0.61 | 1.03 |
| Seaside/ Sand City | Bay St | 0.60 | NF | 0.69 | NF | 13.20 | NF | |

Orthophosphate as P

Comparison of orthophosphate as P results for MRSWMP monitoring reported as mg-P/ L. Shaded boxes indicate that the Basin Plan Objective of 0.12 mg-P/ L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|-----------------------|-----------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 1.00 | NF | 0.80 | NF | 0.60 | NF | 1.0 | NF | 0.6 | NF | -- | -- | NF | NS | NS | NF | |
| | | Ocean | 0.87 | NF | 0.80 | NF | 1.15 | NF | 0.7 | NF | 0.4 | NF | -- | -- | NF | NS | 2.00 | NF | |
| | | 8 th Avenue | NS | NS | 0.90 | NF | 1.23 | 0.20 | 1.1 | NF | 0.6 | NF | -- | -- | NF | NS | NS | ND | |
| | Monterey | Twin 51's | 0.48 | 0.71 | 0.40 | 0.10 | 0.90 | 0.32 | 0.4 | 0.3 | 0.4 | 1.2 | 0.5 | ND | ND | 0.20 | 0.40 | ND | |
| | | San Carlos | 0.32 | NF | 0.30 | NF | 0.49 | NF | 0.3 | NF | 0.2 | NF | 0.3 | NF | NF | ND | 0.40 | NF | |
| | | Steinbeck | 0.71 | 0.68 | 1.50 | NF | 2.54 | NF | 1.2 | NF | 1.4 | NF | 2.8 | 0.2 | 0.10 | 0.50 | 4.20 | NF | |
| | Monterey County | Boronda | 0.45* | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 0.30 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 0.15 | NF | 0.62 | NF | 0.9 | NF | 0.2 | NF | 0.4 | NF | NF | 0.20 | 0.70 | NF | |
| | | Crossroads | NS | NS | 0.20 | NF | 0.38 | NF | 0.2 | NF | 0.1 | NF | 0.3 | NF | NF | ND | 0.20 | NF | |
| | Pacific Grove | HopkinsMon | 0.56 | NF | 0.95 | NF | 0.74 | 0.16 | 0.3 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 0.75 | NF | 1.15 | NF | 0.61 | NF | 0.9 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8th St | 0.50 | NF | 0.50 | 0.20 | 0.55 | NF | 0.4 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 0.52 | 0.14 | 0.40 | 0.10 | 0.48 | ND | 0.4 | ND | 0.7 | ND | 0.8 | ND | ND | NS | 0.70 | ND | |
| | | Lover's | 0.64 | ND | 0.75 | NF | 1.66 | NF | 0.5 | NF | 0.3 | NF | 0.8 | NF | NF | NS | 1.10 | NF | |
| | | Pico | 0.77 | 0.06 | 0.40 | ND | 0.64 | ND | 0.5 | ND | 0.7 | ND | 1.0 | ND | ND | 0.10 | 0.90 | ND | |
| | Seaside/ Sand City | Bay St | 0.43 | NF | 0.15 | NF | 0.27 | NF | 0.4 | NF | 0.2 | NF | 0.2 | NF | NF | 0.10 | 0.40 | NF | |

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Orthophosphate as P continued

| | | Site Name | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 | SuR 2010 | SpR 2010 | FF 2009 | DR 2009 | |
|-----------------------|-----------------------|------------------------|-------------|------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | NF | NS | 0.19 | NF | NF | NF | 0.32 | ND | NF | ND | 0.54 | NF | NF | NF | 0.78 | NF | |
| | | Ocean | NF | NS | 0.67 | NF | 0.19 | NF | 0.77 | NF | NF | NF | 1.18 | NF | 2.70 | NF | 0.81 | NF | |
| | | 8 th Avenue | ND | NS | NS | NF | ND | 0.10 | 0.65 | ND | 1.44 | ND | 0.92 | ND | ND | 0.24 | 0.75 | 0.20 | |
| | Monterey | Twin 51's | 0.20 | 0.10 | 0.31 | 0.11 | 0.13 | 0.11 | 0.52 | 0.09 | NF | 0.11 | 0.94 | ND | 0.20 | 0.25 | 0.92 | 0.30 | |
| | | San Carlos | ND | NS | NS | NF | ND | 0.10 | 0.19 | ND | ND | 0.15 | 0.33 | 0.17 | 0.10 | 0.19 | 0.18 | 0.20 | |
| | | Steinbeck | 0.40 | 0.50 | 1.82 | 0.14 | 0.31 | 0.15 | 0.98 | ND | ND | 0.10 | 7.01 | 0.32 | 0.30 | 0.35 | 2.48 | 0.30 | |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | 0.10 | 0.46 | NF | NF | NF | 0.17 | NF | NF | NF | 0.38 | NF | NF | NF | NF | 0.31 | 0.90 |
| | | Crossroads | NF | ND | 0.37 | NF | NF | NF | 0.16 | NF | NF | NF | 0.64 | NF | NF | NF | NF | 0.31 | NF |
| | Pacific Grove | HopkinsMon | ND | NS | NS | NS | ND | NS | 0.22 | NF | ND | ND | 0.60 | 0.11 | 0.10 | 0.18 | 0.34 | 0.30 | |
| | | HopkinsPG | NF | NS | NS | NS | NF | NS | 0.54 | NF | NF | NF | 1.79 | NF | NF | NF | 1.60 | NF | |
| | | 8th St | NF | NS | NS | NF | NF | 0.21 | NF | NF | ND | 0.12 | 0.46 | 0.60 | NF | NF | 0.56 | NF | |
| | | Greenwood | 0.30 | NS | 0.37 | 0.13 | ND | 0.10 | 0.35 | ND | ND | 0.10 | 0.68 | 0.08 | 0.20 | 0.18 | 0.51 | 0.10 | |
| | | Lover's | NF | NS | 0.63 | NF | NF | 0.13 | 0.41 | NF | ND | 0.18 | 0.18 | 0.12 | 0.20 | 0.32 | 0.70 | 0.10 | |
| | | Pico | ND | ND | 0.41 | ND | ND | 0.10 | 0.37 | ND | ND | ND | 0.58 | ND | 0.05 | 0.13 | 0.40 | 0.10 | |
| | Seaside/ Sand City | Bay St | NF | ND | 0.23 | NF | NF | NF | 0.17 | NF | NF | ND | 0.34 | NF | NF | NF | 0.31 | NF | |

Orthophosphate as P continued

| | | Site Name | FF 2008 | DR 2008 | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|-----------------------|-----------------------|------------------------|------------|------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 0.70 | NF | 1.24 | NF | -- | -- |
| | | Ocean | 0.93 | NF | 0.77 | NF | -- | -- |
| | | 8 th Avenue | 1.37 | 0.20 | 0.99 | ND | -- | -- |
| | Monterey | Twin 51's | 0.97 | 0.20 | 0.72 | ND | 0.56 | 0.35 |
| | | San Carlos | 0.60 | 0.20 | 0.38 | ND | 0.46 | ND |
| | | Steinbeck | 3.77 | 3.10 | 2.69 | 0.09 | 3.01 | 0.38 |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- |
| | | Pajaro | 0.50 | NF | -- | -- | -- | -- |
| | | Crossroads | -- | -- | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 0.73 | 0.20 | 3.38 | NF | 2.37 | NF |
| | | HopkinsPG | 1.80 | NF | 0.51 | NF | -- | -- |
| | | 8th St | 0.90 | NF | 0.52 | NF | 0.49 | NF |
| | | Greenwood | 1.40 | 0.20 | 0.65 | 0.07 | 0.53 | ND |
| | | Lover's | 1.30 | 0.20 | 0.93 | ND | 1.38 | NF |
| | | Pico | 0.70 | 0.20 | 0.73 | ND | 0.44 | ND |
| | Seaside/ Sand City | Bay St | 0.40 | NF | 0.09 | NF | 0.32 | NF |

Potassium

Comparison of potassium results for MRSWMP monitoring reported as mg/L. Shaded boxes indicate that the General Permit Action Level of 20 mg/L was exceeded; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|-----------------------|-----------------------|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|------------|----|
| Sites by Jurisdiction | Carmel | 4th Ave. | 10.4 | NF | 16.35 | NF | 12.0 | NF | 11.3 | NF | 9.5 | NF | -- | -- | NF | NS | NS | NF | |
| | | Ocean Ave. | 6.8 | NF | 12.55 | NF | 7.0 | NF | 6.3 | NF | 5.1 | NF | -- | -- | NF | NS | 16 | NF | |
| | | 8th Ave | NS | NS | 18.55 | NF | 8.0 | 6 | 10.0 | NF | 8.2 | NF | -- | -- | NF | NS | NS | 1.6 | |
| | Monterey | Twin 51's | 5.5 | 10.2 | 5.30 | 6.7 | 5.0 | 10 | 3.5 | 8.3 | 5.2 | 8 | 5.4 | 18.0 | 11 | 1.5 | 9 | 6.9 | |
| | | San Carlos | 2.9 | NF | 4.05 | NF | 4.0 | NF | 2.5 | NF | 3.0 | NF | 5.2 | NF | NF | 1.3 | 7 | NF | |
| | | Steinbeck | 3.7 | 5.9 | 5.05 | NF | 8.0 | NF | 4.1 | NF | 5.5 | NF | 8.9 | 4.2 | 4.1 | 1.4 | 12 | NF | |
| | Monterey County | Boronda | NS | NS | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 2.9 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 2.60 | NF | 5.0 | NF | 8.5 | NF | 3.8 | NF | 4.6 | NF | NF | 2.5 | 9 | NF | |
| | | Crossroads | NS | NS | 3.00 | NF | 2.0 | NF | 1.9 | NF | 1.5 | NF | 2.5 | NF | NF | 0.8 | 3 | NF | |
| | Pacific Grove | HopkinsMon | 4.7 | NF | 5.40 | NF | 5.0 | 15 | 4.4 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 6.2 | NF | 8.10 | NF | 5.0 | NF | 5.4 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8 th Street | 5.0 | NF | 5.90 | 8.6 | 6.0 | NF | 3.8 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 5.7 | 6.5 | 7.75 | 8.4 | 5.0 | 10 | 4.0 | 7.3 | 7.5 | 5.1 | 6.6 | 6.7 | 5.6 | NS | 13 | 6.4 | |
| | | Lover's | 6.2 | 6.1 | 8.75 | NF | 6.0 | NF | 4.5 | NF | 4.2 | NF | 6.2 | NF | NF | NS | 14 | NF | |
| | | Pico | 11.5 | 4.9 | 9.40 | 5.1 | 6.0 | 6 | 7.4 | 4.6 | 14.0 | 5.2 | 10.5 | 5.9 | 5.5 | 2.6 | 12 | 5.1 | |
| | Seaside/ Sand City | Bay St | 5.2 | NF | 350.5 | NF | 55.0 | NF | 2.8 | NF | 4.0 | NF | 3.0 | NF | NF | 1.3 | 8 | NF | |

Total Suspended Solids (TSS)

Comparison of Total Suspended Solids (TSS) results for MRSWMP monitoring reported in mg/L. Shaded boxes indicate that the CCAMP Action Level of 500 mg/L was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|-----------------------|-----------------------|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|----|
| Sites by Jurisdiction | Carmel | 4th Ave. | 260 | NF | 162 | NF | 129 | NF | 96 | NF | 312 | NF | -- | -- | NF | NS | NS | NF | |
| | | Ocean Ave. | 24 | NF | 45 | NF | 22 | NF | 18 | NF | 62 | NF | -- | -- | NF | NS | 20 | NF | |
| | | 8th Ave | NS | NS | 127 | NF | 26 | 4 | 36 | NF | 101 | NF | -- | -- | NF | NS | NS | ND | |
| | Monterey | Twin 51's | 168 | 2 | 47 | 2 | 96 | 4 | 28 | 2 | 59 | 3 | 73 | ND | ND | 14 | 69 | 3 | |
| | | San Carlos | 62 | NF | 48 | NF | 54 | NF | 6 | NF | 25 | NF | 91 | NF | NF | 44 | 13 | NF | |
| | | Steinbeck | 92 | 6 | 42 | NF | 38 | NF | 7 | NF | 24 | NF | 84 | ND | ND | 34 | 21 | NF | |
| | Monterey County | Boronda | 724* | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 55 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 150 | NF | 652 | NF | 111 | NF | 191 | NF | 152 | NF | NF | 244 | 132 | NF | |
| | | Crossroads | NS | NS | 41 | NF | 6 | NF | 6 | NF | 20 | NF | 12 | NF | NF | 20 | 7 | NF | |
| | Pacific Grove | HopkinsMon | 36 | NF | 48 | NF | 46 | 10 | 7 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 33 | NF | 37 | NF | 48 | NF | 9 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8th St | 89 | NF | 29 | 3 | 71 | NF | 7 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 47 | 2 | 37 | 7 | 178 | 2 | 12 | 2 | 50 | 6 | 59 | 3 | 8 | NS | 36 | 4 | |
| | | Lover's | 63 | ND | 24 | NF | 29 | NF | 20 | NF | 20 | NF | 33 | NF | NF | NS | 11 | NF | |
| | | Pico | 183 | ND | 47 | ND | 41 | ND | 14 | ND | 61 | ND | 27 | ND | ND | 68 | 32 | ND | |
| | Seaside/ Sand City | Bay St | 129 | NF | 23 | NF | 82 | NF | 32 | NF | 35 | NF | 173 | NF | NF | 33 | 66 | NF | |

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Total Suspended Solids (TSS) continued

| | | Site Name | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 | SuR 2010 | SpR 2010 | FF 2009 | DR 2009 | FF 2008 | DR 2008 | |
|------------------------------|-----------------------|------------|-------------|------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|------------|------------|----|
| Sites by Jurisdiction | Carmel | 4th Ave. | NF | NS | 139 | NF | NF | NF | 557 | ND | NF | ND | 212 | NF | NF | NF | 121 | NF | 116 | NF | |
| | | Ocean Ave. | NF | NS | 57 | NF | 14 | NF | 292 | NF | NF | NF | 42 | NF | 45 | NF | 28 | NF | 34 | NF | |
| | | 8th Ave | ND | NS | NS | NF | ND | ND | 99 | ND | ND | ND | 36 | 3 | ND | ND | 57 | ND | 20 | 5 | |
| | Monterey | Twin 51's | 6 | 19 | 74 | ND | ND | ND | 15 | ND | ND | ND | 183 | 61 | 5 | ND | 44 | 6 | 74 | 5 | |
| | | San Carlos | 3 | NS | NS | NF | ND | ND | 100 | ND | ND | ND | 69 | 3 | ND | ND | 22 | ND | 32 | 5 | |
| | | Steinbeck | 4 | 8 | 30 | 7 | 18 | 2 | 88 | ND | ND | ND | 56 | 6 | ND | ND | 68 | 8 | 49 | 8 | |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | 276 | 140 | NF | NF | NF | 230 | NF | NF | NF | 348 | NF | NF | NF | 270 | 42 | 743 | NF | |
| | | Crossroads | NF | 5 | 11 | NF | NF | NF | 11 | NF | NF | NF | 15 | NF | NF | NF | 21 | NF | -- | -- | |
| | Pacific Grove | HopkinsMon | 35 | NS | NS | NS | ND | NS | 57 | NF | 8 | ND | 30 | ND | 8 | 7 | 106 | 51 | 34 | 12 | |
| | | HopkinsPG | NF | NS | NS | NS | NF | NS | 75 | NF | NF | NF | 82 | NF | NF | NF | 45 | NF | 25 | NF | |
| | | 8th St | NF | NS | NS | NF | NF | 2 | NF | NF | 20 | ND | 26 | 188 | NF | NF | 31 | NF | 15 | NF | |
| | | Greenwood | 3 | NS | 17 | 2 | ND | 4 | 174 | ND | ND | 7 | 50 | 5 | 6 | 0 | 60 | 0 | 19 | 14 | |
| | | Lover's | NF | NS | 21 | NF | NF | ND | 118 | NF | 9 | 12 | 20 | 3 | ND | ND | 52 | ND | 25 | 1.9 | |
| | | Pico | 2 | 12 | 10 | ND | ND | ND | 57 | ND | ND | ND | 36 | ND | 6 | ND | 20 | ND | 45 | ND | |
| | Seaside/ Sand City | Bay St | NF | 63 | 33 | NF | NF | NF | 59 | NF | NF | ND | 173 | NF | NF | NF | 123 | NF | 66 | NF | |

Total Suspended Solids (TSS) continued

| | | Site Name | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|------------------------------|-----------------------|------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4th Ave. | 103 | NF | -- | -- |
| | | Ocean Ave. | 59 | NF | -- | -- |
| | | 8th Ave | 89 | 4 | -- | -- |
| | Monterey | Twin 51's | 137 | 3 | 41 | 2 |
| | | San Carlos | 47 | 3080 | 46 | ND |
| | | Steinbeck | 66 | 4 | 14 | 12 |
| | Monterey County | Boronda | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- |
| | | Pajaro | -- | -- | -- | -- |
| | | Crossroads | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 36 | NF | 29 | NF |
| | | HopkinsPG | 43 | NF | -- | -- |
| | | 8th St | 75 | NF | 39 | |
| | | Greenwood | 71 | 3 | 23 | 33 |
| | | Lover's | 35 | 5 | 24 | NF |
| | | Pico | 86 | 5 | 40 | ND |
| | Seaside/ Sand City | Bay St | 38 | NF | 3 | NF |

Turbidity

Comparison of turbidity results for MRSWMP monitoring reported in NTU. Shaded boxes indicate that the CCRWQCB Action Level of 25 NTU was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2013, sampling has been conducted during dry weather for the Dry Run (DR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF).

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 | |
|-----------------------|-----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|------------|----|
| Sites by Jurisdiction | Carmel | 4th Ave. | 105.0 | NF | 85 | NF | 91 | NF | 44.5 | NF | 103.0 | NF | -- | -- | NF | NS | NS | NF | |
| | | Ocean Ave. | 10.5 | NF | 25 | NF | 20 | NF | 21.5 | NF | 14.0 | NF | -- | -- | NF | NS | 24.0 | NF | |
| | | 8th Ave | NS | NS | 54 | NF | 19 | 10.0 | 11.0 | NF | 26.0 | NF | -- | -- | NF | NS | NS | 1.1 | |
| | Monterey | Twin 51's | 51.5 | 2.9 | 23 | 1.4 | 52 | 3.8 | 16.5 | 6.1 | 33.0 | 3.4 | 21.0 | 2.0 | 1.6 | 12.0 | 50.0 | 3.8 | |
| | | San Carlos | 33.0 | NF | 38 | NF | 57 | NF | 5.2 | NF | 14.0 | NF | 37.0 | NF | NF | 16.0 | 17.3 | NF | |
| | | Steinbeck | 41.5 | 10.0 | 43 | NF | 39 | NF | 5.0 | NF | 14.0 | NF | 32.0 | 0.7 | 0.7 | 16.0 | 13.0 | NF | |
| | Monterey County | Boronda | 900* | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 28.0 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 118 | NF | 606 | NF | 2.3 | NF | 140.0 | NF | 140.0 | NF | NF | 120.0 | 175.0 | NF | |
| | | Crossroads | NS | NS | 40 | NF | 19 | NF | 4.7 | NF | 9.0 | NF | 12.0 | NF | NF | 13.0 | 7.0 | NF | |
| | Pacific Grove | HopkinsMon | 20.0 | NF | 48 | NF | 44 | 5.3 | 4.4 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 21.5 | NF | 32 | NF | 50 | NF | 3.9 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8th St | 33.0 | NF | 25 | 2.1 | 40 | NF | 4.6 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 35.5 | 5.1 | 27 | 6.3 | 71 | 4.7 | 10.1 | 4.5 | 25.0 | 5.0 | 25.0 | 4.0 | 2.1 | NS | 24.0 | 1.5 | |
| | | Lover's | 23.5 | 0.7 | 19 | NF | 30 | NF | 12.3 | NF | 10.0 | NF | 20.0 | NF | NF | NS | 7.1 | NF | |
| | | Pico | 60.0 | 15.0 | 25 | 4.2 | 28 | 6.7 | 7.9 | 10.0 | 32.0 | 3.3 | 21.0 | 7.2 | 2.1 | 18.0 | 18.0 | 3.0 | |
| | Seaside/ Sand City | Bay St | 45.5 | NF | 4 | NF | 69 | NF | 12.3 | NF | 19.0 | NF | 41.0 | NF | NF | 20.0 | 40.0 | NF | |

*Data provided by Monterey County from sampling that occurred one day after First Flush.

Urea

Comparison of urea results for MRSWMP monitoring reported in µg/L. There is no water quality objective and First Flush results are from a single sample during the first time series; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 |
|-----------------------|-----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4th Ave. | 307 | NF | 94 | NF | 109 | NF | 239 | NF | 122 | NF | -- | -- | NF | NS | NS | NF |
| | | Ocean Ave. | 481 | NF | 169 | NF | 436 | NF | 289 | NF | 187 | NF | -- | -- | NF | NS | 699 | NF |
| | | 8th Ave | NS | NS | 258 | NF | 269 | 32 | 212 | NF | 173 | NF | -- | -- | NF | NS | NS | ND |
| | Monterey | Twin 51's | 421 | 197 | 117 | 49 | ND | 139 | 186 | 102 | 266 | 254 | 598 | 45 | 22 | 45 | 595 | 131 |
| | | San Carlos | 277 | NF | 247 | NF | ND | NF | 145 | NF | 118 | NF | 434 | NF | NF | 68 | 572 | NF |
| | | Steinbeck | 156 | 172 | 1120 | NF | ND | NF | 1120 | NF | 914 | NF | 4490 | 24 | 27 | 228 | 2075 | NF |
| | Monterey County | Boronda | NS | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 149 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 140 | NF | 434 | NF | 5260 | NF | 827 | NF | 313 | NF | NF | 49 | 838 | NF |
| | | Crossroads | NS | NS | 149 | NF | 150 | NF | 129 | NF | 80 | NF | 271 | NF | NF | 56 | 114 | NF |
| | Pacific Grove | HopkinsMon | 186 | NF | 249 | NF | 754 | 95 | 168 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 372 | NF | 1040 | NF | 278 | NF | 740 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8th St | 197 | NF | 207 | 587 | 280 | NF | 102 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 155 | 47 | 154 | 37 | 177 | 124 | 143 | 92 | 180 | ND | 378 | 43 | 17 | NS | 446 | 11 |
| | | Lover's | 221 | 25 | 206 | NF | 249 | NF | 135 | NF | 150 | NF | 914 | NF | NF | NS | 450 | NF |
| | | Pico | 224 | 47 | 83 | ND | 140 | 15 | 89 | ND | 451 | ND | 292 | 10 | 435 | 34 | 225 | ND |
| | Seaside/ Sand City | Bay St | 144 | NF | 26 | NF | ND | NF | 205 | NF | 304 | NF | 298 | NF | NF | 57 | 787 | NF |

Urea continued

| | | Site Name | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 | SuR 2010 | SpR 2010 | FF 2009 | DR 2009 | |
|------------------------------|-----------------------|------------|-------------|------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|----|
| Sites by Jurisdiction | Carmel | 4th Ave. | NF | NS | 293 | NF | NF | NF | 46 | ND | NF | ND | 225 | NF | | NF | 393 | NF | |
| | | Ocean Ave. | NF | NS | 156 | NF | 31 | NF | 47 | NF | NF | NF | 417 | NF | 400 | NF | 105 | NF | |
| | | 8th Ave | ND | NS | NS | NF | ND | 5 | 547 | ND | 10 | ND | 426 | ND | ND | ND | 419 | ND | |
| | Monterey | Twin 51's | 93 | 55 | 193 | 32 | 87 | 61 | 179 | 35 | 53 | 16 | 520 | 21 | 16 | 258 | 920 | 250 | |
| | | San Carlos | ND | NS | NS | NF | ND | 5 | 73 | ND | 10 | ND | 326 | 878 | 15 | 10 | 331 | ND | |
| | | Steinbeck | 938 | 405 | 478 | 29 | 127 | 5 | 393 | 30 | 42 | ND | 2234 | 11 | 10 | 213 | 1547 | 11 | |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | 98 | 312 | NF | NF | NF | 44 | NF | NF | NF | 609 | NF | NF | NF | 241 | 74 | |
| | | Crossroads | NF | 20 | 289 | NF | NF | NF | 52 | NF | NF | NF | 519 | NF | NF | NF | 321 | NF | |
| | Pacific Grove | HopkinsMon | ND | NS | NS | NS | ND | NS | 55 | NF | 30 | ND | 160 | ND | ND | 36 | 456 | 193 | |
| | | HopkinsPG | NF | NS | NS | NS | NF | NS | 378 | NF | NF | NF | 1628 | NF | NF | NF | 1671 | NF | |
| | | 8th St | NF | NS | NS | NF | NF | 1861 | NF | NF | 83 | ND | 192 | 389 | NF | NF | 141 | NF | |
| | | Greenwood | 56 | NS | 423 | 11 | 11 | 5 | 168 | 12 | 44 | 70 | 280 | 5 | 636 | 31 | 120 | 14 | |
| | | Lover's | NF | NS | 98 | NF | NF | 57 | 97 | NF | 12 | ND | 54 | 5 | ND | 13 | 118 | 20 | |
| | | Pico | 42 | 63 | 63 | ND | ND | 5 | 25 | ND | 10 | 20 | 96 | 5 | 24 | 13 | 35 | 15 | |
| | Seaside/ Sand City | Bay St | NF | 349 | 158 | NF | NF | NF | 143 | NF | NF | ND | 284 | NF | NF | NF | 62 | NF | |

Urea continued

| | | Site Name | FF 2008 | DR 2008 | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|------------------------------|-----------------------|------------|------------|------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4th Ave. | 84 | NF | 195 | NF | -- | -- |
| | | Ocean Ave. | 250 | NF | 280 | NF | -- | -- |
| | | 8th Ave | 331 | 10 | 345 | 10 | -- | -- |
| | Monterey | Twin 51's | 753 | 45 | 560 | 116 | 724 | 53 |
| | | San Carlos | 336 | 15 | 440 | 35 | 370 | 13 |
| | | Steinbeck | 740 | 1 | 1965 | 1028 | 4777 | 152 |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- |
| | | Pajaro | 98 | NF | -- | -- | -- | -- |
| | | Crossroads | -- | -- | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 38 | 173 | 2495 | NF | 3263 | NF |
| | | HopkinsPG | 840 | NF | 275 | NF | -- | -- |
| | | 8th St | 267 | NF | 210 | NF | 139 | NF |
| | | Greenwood | 470 | 71 | 455 | 428 | 348 | 485 |
| | | Lover's | 41 | 57 | 320 | 23 | 217 | NF |
| | | Pico | 104 | 69 | 240 | 10 | 150 | ND |
| | Seaside/ Sand City | Bay St | 108 | NF | 205 | NF | 60 | NF |

Zinc

Comparison of total zinc results for MRSWMP monitoring reported in µg/L. Shaded boxes indicate that the Basin Plan Objective of 200 µg/L was exceeded; NA= Not Analyzed; ND= Non-detect; NF= No Flow; NS= Not Sampled; -- = Not included in MRSWMP monitoring. Since 2006, sampling has been conducted during dry weather for the Dry Run (DR), Spring Run (SpR) and Summer Run (SuR), and during wet weather for the First Flush (FF) and Second Flush (SF). The table below is broken into sections to facilitate printing.

| | | Site Name | FF 2019 | DR 2019 | FF 2018 | DR 2018 | FF 2017 | DR 2017 | FF 2016 | DR 2016 | FF 2015 | DR 2015 | FF 2014 | DR 2014 | SuR 2014 | SF 2014 | FF 2013 | DR 2013 |
|------------------------------|-----------------------|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 131 | NF | 141 | NF | 198 | NF | 133 | NF | 148 | NF | -- | -- | NF | NS | NS | NF |
| | | Ocean | 152 | NF | 238 | NF | 194 | NF | 144 | NF | 106 | NF | -- | -- | NF | NS | 395 | NF |
| | | 8 th Avenue | NS | NS | 201 | NF | 111 | 71 | 125 | NF | 169 | NF | -- | -- | NF | NS | NS | 24 |
| | Monterey | Twin 51's | 136 | 95 | 99 | 74 | 220 | 17 | 93 | 56 | 167 | 114 | 513 | 313 | 48 | 58 | 504 | 93 |
| | | San Carlos | 139 | NF | 150 | NF | 157 | NF | 92 | NF | 118 | NF | 692 | NF | NF | 96 | 269 | NF |
| | | Steinbeck | 233 | 119 | 222 | NF | 249 | NF | 149 | NF | 170 | NF | 764 | 53 | 25 | 112 | 293 | NF |
| | Monterey County | Boronda | NS | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | 146 | NF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NS | NS | 143 | NF | 424 | NF | 317 | NF | 167 | NF | 231 | NF | NF | 264 | 297 | NF |
| | | Crossroads | NS | NS | 156 | NF | 130 | NF | 134 | NF | 78 | NF | 229 | NF | NF | 81 | 185 | NF |
| | Pacific Grove | HopkinsMon | 119 | NF | 152 | NF | 142 | 106 | 112 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | HopkinsPG | 286 | NF | 275 | NF | 136 | NF | 189 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | 8th St | 122 | NF | 101 | ND | 121 | NF | 74 | NF | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Greenwood | 106 | 13 | 135 | ND | 180 | 13 | 93 | ND | 129 | ND | 410 | 60 | 48 | NS | 263 | 20 |
| | | Lover's Pt | 105 | ND | 112 | NF | 107 | NF | 80 | NF | 87 | NF | 406 | NF | NF | NS | 204 | NF |
| | | Pico | 113 | 41 | 68 | ND | 92 | ND | 68 | 23 | 150 | ND | 144 | 39 | ND | 63 | 129 | 37 |
| | Seaside/ Sand City | Bay St | 210 | NF | ND | NF | 136 | NF | 138 | NF | 141 | NF | 703 | NF | NF | 119 | 402 | NF |

Zinc continued

| | | Site Name | SuR 2013 | SF 2013 | FF 2012 | DR 2012 | SuR 2012 | SpR 2012 | FF 2011 | DR 2011 | SuR 2011 | SpR 2011 | FF 2010 | DR 2010 | SuR 2010 | SpR 2010 | FF 2009 | DR 2009 | |
|-----------------------|-----------------------|------------------------|-------------|------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|-------------|-------------|------------|------------|----|
| Sites by Jurisdiction | Carmel | 4 th Avenue | NF | NS | 145 | NF | NF | NF | 312 | 11 | NF | 104 | 195 | NF | NF | NF | 226 | NF | |
| | | Ocean | NF | NS | 203 | NF | 98 | NF | 354 | NF | NF | NF | 650 | NF | 439 | NF | 288 | NF | |
| | | 8 th Avenue | 92 | NS | NS | NF | ND | 26 | 214 | 20 | 19 | ND | 344 | 15 | 14 | 17 | 256 | 19 | |
| | Monterey | Twin 51's | 46 | 70 | 147 | 28 | ND | 40 | 142 | 20 | 25 | 25 | 385 | 46 | 52 | 20 | 313 | 29 | |
| | | San Carlos | 36 | NS | NS | NF | ND | 43 | 264 | 17 | 29 | 67 | 351 | 28 | 28 | 25 | 213 | 19 | |
| | | Steinbeck | 43 | 158 | 392 | 38 | 21 | 60 | 258 | 19 | 31 | 62 | 808 | 31 | 29 | 40 | 400 | 196 | |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Pajaro | NF | 182 | 198 | NF | NF | NF | 170 | NF | NF | NF | 351 | NF | NF | NF | 273 | 41 | |
| | | Crossroads | NF | 79 | 211 | NF | NF | NF | 97 | NF | NF | NF | 330 | NF | NF | NF | 303 | NF | |
| | Pacific Grove | HopkinsMon | 60 | NS | NS | NS | ND | NS | 138 | NF | 36 | 24 | 322 | 24 | 22 | 35 | 341 | 234 | |
| | | HopkinsPG | NF | NS | NS | NS | NF | NS | 166 | NF | NF | NF | 945 | NF | NF | NF | 477 | NF | |
| | | 8th St | NF | NS | NS | NF | NF | 22 | NF | NF | 88 | 15 | 156 | 567 | NF | NF | 147 | NF | |
| | | Greenwood | 14 | NS | 102 | ND | ND | 21 | 300 | ND | 16 | 12 | 232 | 5 | ND | 14 | 167 | ND | |
| | | Lover's Pt | NF | NS | 114 | NF | NF | 14 | 182 | NF | 16 | 36 | 65 | 5 | ND | 14 | 166 | ND | |
| | | Pico | ND | 70 | 58 | 21 | ND | 12 | 86 | ND | 11 | 34 | 139 | 17 | 16 | 11 | 87 | ND | |
| | Seaside/ Sand City | Bay St | NF | 187 | 94 | NF | NF | NF | 219 | NF | NF | 22 | 272 | NF | NF | NF | 345 | NF | |

Zinc continued

| | | Site Name | FF 2008 | DR 2008 | FF 2007 | DR 2007 | FF 2006 | DR 2006 |
|------------------------------|-----------------------|------------------------|------------|------------|------------|------------|------------|------------|
| Sites by Jurisdiction | Carmel | 4 th Avenue | 116 | NF | 170 | NF | -- | -- |
| | | Ocean | 225 | NF | 361 | NF | -- | -- |
| | | 8 th Avenue | 237 | 20 | 303 | 61 | -- | -- |
| | Monterey | Twin 51's | 273 | 28 | 330 | 25 | 295 | ND |
| | | San Carlos | 157 | 18 | 269 | 10 | 342 | ND |
| | | Steinbeck | 347 | 110 | 384 | 130 | 411 | ND |
| | Monterey County | Boronda | -- | -- | -- | -- | -- | -- |
| | | Las Palmas | -- | -- | -- | -- | -- | -- |
| | | Pajaro | 368 | NF | -- | -- | -- | -- |
| | | Crossroads | -- | -- | -- | -- | -- | -- |
| | Pacific Grove | HopkinsMon | 194 | 99 | 382 | NF | 307 | NF |
| | | HopkinsPG | 305 | NF | 231 | NF | -- | -- |
| | | 8th St | 121 | NF | 173 | NF | 153 | |
| | | Greenwood | 156 | 35 | 236 | 11 | 180 | 27 |
| | | Lover's Pt | 123 | 10 | 175 | 13 | 158 | NF |
| | | Pico | 96 | 12 | 154 | 10 | 142 | ND |
| | Seaside/ Sand City | Bay St | 124 | NF | 185 | NF | 33 | NF |

Appendix 3: Results by Jurisdiction (listed alphabetically)

Carmel 2019 MRSWMP monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series (FF-Avg). Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow; -- = Not included in MRSWMP.

| Analytes | WQO or Action Level | 4 th Avenue | | | | Ocean Avenue | | | |
|------------------------------|---------------------|------------------------|-------|--------|--------|--------------|-------|--------|--------|
| | | DR | FF- A | FF - B | FF Avg | DR | FF- A | FF - B | FF Avg |
| Ammonia (mg/L) | 50 mg/L | NF | 0.79 | 0.80 | 0.80 | NF | 0.93 | 0.97 | 0.95 |
| Color (Color Units) | 500 color units | NF | 750 | 350 | 550 | NF | 150 | 200 | 175 |
| Copper (ug/L) | 30 ug/L | NF | 66 | 75 | 71 | NF | 81 | 86 | 84 |
| <i>E. coli</i> (MPN/ 100 ml) | 235 MPN/ 100 ml | NF | 36500 | 29900 | 33200 | NF | 16200 | 17200 | 16700 |
| Enterococcus (MPN/ 100 ml) | 104 MPN/ 100 ml | NF | 14670 | 22820 | 18745 | NF | 12110 | 19680 | 15895 |
| Hardness mg/L | <10 and >2000 mg/L | NF | 78 | 88 | 83 | NF | 29 | 34 | 32 |
| Lead (ug/L) | 30 ug/L | NF | 37.4 | 19.3 | 28.4 | NF | 4.7 | 4.4 | 4.6 |
| MBAS Surfactants | 0.2 mg/L | NF | 0.45 | 0.47 | 0.46 | NF | 0.58 | 0.58 | 0.58 |
| NO3-N (mg-N/ L) | 2.25 mg-N/ L | NF | 1.0 | 1.1 | 1.1 | NF | 0.5 | 0.5 | 0.5 |
| PO4-P (mg-P/ L) | 0.12 mg-P/ L | NF | 0.94 | 1.05 | 1.00 | NF | 0.88 | 0.86 | 0.87 |
| Potassium (mg/L) | 20 mg/ L | NF | 10.4 | 10.3 | 10.4 | NF | 6.7 | 6.8 | 6.8 |
| TSS (mg/L) | 500 mg/L | NF | 342 | 177 | 260 | NF | 26 | 21 | 24 |
| Turbidity (NTU) | 25 NTU | NF | 112 | 98 | 105 | NF | 11 | 10 | 11 |
| Urea (ug/L) | None currently | NF | 307 | -- | 307 | NF | 481 | -- | 481 |
| Zinc (ug/L) | 200 ug/L | NF | 153 | 109 | 131 | NF | 140 | 163 | 152 |

Monterey 2019 MRSWMP monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series (FF-Avg). Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow; -- = Not included in MRSWMP monitoring.

| Analytes | WQO or Action Level | Twins | | | | San Carlos | | | | Steinbeck | | | |
|-----------------------------|---------------------|-------|-------|--------|--------|------------|-------|--------|--------|-----------|-------|--------|--------|
| | | DR | FF- A | FF - B | FF Avg | DR | FF- A | FF - B | FF Avg | DR | FF- A | FF - B | FF Avg |
| Ammonia (mg/L) | 50 mg/L | 0.90 | 0.49 | 0.47 | 0.48 | NF | 0.34 | NS | 0.34 | ND | 0.71 | 1.07 | 0.89 |
| Color (Color Units) | 500 color units | 75 | 175 | 200 | 188 | NF | 150 | NS | 150 | 375 | 150 | 100 | 125 |
| Copper (ug/L) | 30 ug/L | 23 | 29 | 22 | 26 | NF | 22 | NS | 22 | 193 | 38 | 36 | 37 |
| <i>E. coli</i> (MPN/100 ml) | 235 MPN/ 100 ml | 8164 | 64900 | 54800 | 59850 | NF | 5630 | NS | 5630 | 3578 | 21000 | 14400 | 17700 |
| Enterococcus (MPN/100 ml) | 104 MPN/ 100 ml | 723 | 72700 | 41060 | 56880 | NF | 10120 | NS | 10120 | 2320 | 16640 | 14670 | 15655 |
| Hardness mg/L | <10 and >2000 mg/L | 347 | 58 | 68 | 63 | NF | 27 | NS | 27 | 142 | 29 | 29 | 29 |
| Lead (ug/L) | 30 ug/L | 0.8 | 29.6 | 19.2 | 24.4 | NF | 14.4 | NS | 14.4 | 2.1 | 31.8 | 7.6 | 19.7 |
| MBAS Surfactants | 0.2 mg/L | 0.21 | 0.28 | 0.24 | 0.26 | NF | 0.29 | NS | 0.29 | 0.26 | 0.42 | 0.43 | 0.43 |
| NO3-N (mg-N/ L) | 2.25 mg-N/ L | 0.6 | 0.5 | 0.7 | 0.6 | NF | 0.5 | NS | 0.5 | 6.4 | 0.4 | 0.5 | 0.5 |
| PO4-P (mg-P/ L) | 0.12 mg-P/ L | 0.71 | 0.51 | 0.45 | 0.48 | NF | 0.32 | NS | 0.32 | 0.68 | 0.51 | 0.91 | 0.71 |
| Potassium (mg/L) | 20 mg/ L | 10.2 | 5.6 | 5.3 | 5.5 | NF | 2.9 | NS | 2.9 | 5.9 | 3.6 | 3.8 | 3.7 |
| TSS (mg/L) | 500 mg/L | 2 | 241 | 95 | 168 | NF | 62 | NS | 62 | 6 | 160 | 24 | 92 |
| Turbidity (NTU) | 25 NTU | 2.9 | 50 | 53 | 52 | NF | 33 | NS | 33 | 9.7 | 65 | 18 | 42 |
| Urea (ug/L) | None currently | 197 | 421 | -- | 421 | NF | 277 | -- | 277 | 172 | 156 | -- | 156 |
| Zinc (ug/L) | 200 ug/L | 95 | 163 | 108 | 136 | NF | 139 | NS | 139 | 119 | 263 | 202 | 233 |

Monterey County 2019 MRSWMP monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series (FF-Avg). Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow, -- = Not included in MRSWMP monitoring; *Data provided by Monterey County from sampling that occurred one day after First Flush.

| Analytes | WQO or Action Level | Boronda | | | | Las Palmas | | | |
|------------------------------|---------------------|---------|-------|-------|--------|------------|-------|-------|--------|
| | | DR | FF- A | FF- B | FF-Avg | DR | FF- A | FF- B | FF-Avg |
| Ammonia (mg/L) | 50 mg/L | NF | 0.37* | -- | 0.37* | NF | 0.36 | 0.23 | 0.30 |
| Color (Color Units) | 500 color units | NF | NS | NS | NS | NF | 50 | 70 | 60 |
| Copper (ug/L) | 30 ug/L | NF | 16* | -- | 16* | NF | 6 | ND | 4 |
| <i>E. coli</i> (MPN/ 100 ml) | 235 MPN/ 100 ml | NF | 5730* | -- | 5730* | NF | 14100 | 20500 | 17300 |
| Enterococcus (MPN/ 100 ml) | 104 MPN/ 100 ml | NF | NS | NS | NS | NF | 1850 | 3840 | 2845 |
| Hardness mg/L | <10 and >2000 mg/L | NF | 76* | -- | 76* | NF | 35 | 44 | 40 |
| Lead (ug/L) | 30 ug/L | NF | NS | NS | NS | NF | 3.6 | 2.5 | 3.1 |
| MBAS Surfactants (mg/L) | 0.2 mg/L | NF | NS | NS | NS | NF | 0.25 | 0.26 | 0.26 |
| NO3-N (mg-N/ L) | 2.25 mg-N/ L | NF | 0.20* | -- | 0.20* | NF | 0.40 | 0.50 | 0.45 |
| PO4-P (mg-P/ L) | 0.12 mg-P/ L | NF | 0.45* | -- | 0.45* | NF | 0.28 | 0.32 | 0.30 |
| Potassium (mg/L) | 20 mg/ L | NF | NS | NS | NS | NF | 2.8 | 3.0 | 2.9 |
| TSS (mg/L) | 500 mg/L | NF | 724* | -- | 724* | NF | 61 | 48 | 55 |
| Turbidity (NTU) | 25 NTU | NF | 900* | -- | 900* | NF | 25 | 31 | 28 |
| Urea (ug/L) | None currently | NF | NS | NS | NS | NF | 149 | -- | 149 |
| Zinc (ug/L) | 200 ug/L | NF | NS | NS | NS | NF | 157 | 134 | 146 |

Pacific Grove 2019 MRSWMP Monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series (FF-Avg). Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow; -- = Not included in MRSWMP monitoring.

| Analytes | WQO or Action Level | HopkinsMon | | | | HopkinsPG | | | | 8 th Street | | | |
|-----------------------------|---------------------|------------|-------|--------|--------|-----------|-------|--------|--------|------------------------|-------|--------|--------|
| | | DR | FF- A | FF - B | FF Ave | DR | FF- A | FF - B | FF Ave | DR | FF- A | FF - B | FF Ave |
| Ammonia (mg/L) | 50 mg/L | NF | 0.47 | NF | 0.47 | NF | 1.08 | 1.35 | 1.22 | NF | 0.43 | 0.44 | 0.44 |
| Color (Color Units) | 500 color units | NF | 100 | NF | 100 | NF | 150 | 150 | 150 | NF | 70 | 100 | 85 |
| Copper (ug/L) | 30 ug/L | NF | 16 | NF | 16 | NF | 19 | 21 | 20 | NF | 25 | 22 | 24 |
| <i>E. coli</i> (MPN/100 ml) | 235 MPN/ 100 ml | NF | 12300 | NF | 12300 | NF | 7230 | 7380 | 7305 | NF | 32600 | 32600 | 32600 |
| Enterococcus (MPN/100 ml) | 104 MPN/ 100 ml | NF | 10460 | NF | 10460 | NF | 8570 | 8550 | 8560 | NF | 17250 | 19180 | 18215 |
| Hardness mg/L | <10 and >2000 mg/L | NF | 35 | NF | 35 | NF | 45 | 57 | 51 | NF | 35 | 36 | 36 |
| Lead (ug/L) | 30 ug/L | NF | 6.1 | NF | 6.1 | NF | 12.1 | 7.6 | 9.9 | NF | 22.3 | 16.1 | 19.2 |
| MBAS Surfactants | 0.20 mg/L | NF | 0.50 | NF | 0.50 | NF | 0.50 | 0.54 | 0.52 | NF | 0.36 | 0.36 | 0.36 |
| NO3-N (mg-N/ L) | 2.25 mg-N/ L | NF | 0.4 | NF | 0.4 | NF | 1.0 | 1.3 | 1.2 | NF | 0.5 | 0.4 | 0.5 |
| PO4-P (mg-P/ L) | 0.12 mg-P/ L | NF | 0.56 | NF | 0.56 | NF | 0.71 | 0.78 | 0.75 | NF | 0.48 | 0.52 | 0.50 |
| Potassium (mg/L) | 20 mg/ L | NF | 4.7 | NF | 4.7 | NF | 5.8 | 6.6 | 6.2 | NF | 5.1 | 4.8 | 5.0 |
| TSS (mg/L) | 500 mg/L | NF | 36 | NF | 36 | NF | 43 | 22 | 33 | NF | 95 | 82 | 89 |
| Turbidity (NTU) | 25 NTU | NF | 20 | NF | 20 | NF | 22 | 21 | 22 | NF | 39 | 27 | 33 |
| Urea (ug/L) | None currently | NF | 186 | -- | 186 | NF | 372 | -- | 372 | NF | 197 | -- | 197 |
| Zinc (ug/L) | 200 ug/L | NF | 119 | NF | 119 | NF | 263 | 309 | 286 | NF | 136 | 108 | 122 |

Pacific Grove 2019 MRSWMP Monitoring results continued

| Analytes | WQO or Action Level | Greenwood Park | | | | Lovers | | | | Pico | | | |
|-----------------------------|---------------------|----------------|-------|--------|--------|--------|-------|--------|--------|------|-------|--------|--------|
| | | DR | FF- A | FF - B | FF Ave | DR | FF- A | FF - B | FF Ave | DR | FF- A | FF - B | FF Ave |
| Ammonia (mg/L) | 50 mg/L | 0.10 | 0.52 | 0.52 | 0.52 | ND | 0.49 | 0.60 | 0.55 | ND | 0.72 | 0.67 | 0.70 |
| Color (Color Units) | 500 color units | 50 | 100 | 150 | 125 | 24 | 150 | 200 | 175 | 100 | 250 | 150 | 200 |
| Copper (ug/L) | 30 ug/L | 6.5 | 11 | 15 | 13 | ND | 21 | 27 | 24 | 6.8 | 23 | 20 | 22 |
| <i>E. coli</i> (MPN/100 ml) | 235 MPN/ 100 ml | 8664 | 19200 | 27600 | 23400 | 17407 | 19400 | 46100 | 32750 | 900 | 46100 | 38700 | 42400 |
| Enterococcus (MPN/100 ml) | 104 MPN/ 100 ml | 5172 | 15650 | 18420 | 17035 | 20925 | 11120 | 19560 | 15340 | 928 | 20640 | 17850 | 19245 |
| Hardness mg/L | <10 and >2000 mg/L | 330 | 32 | 40 | 36 | 365 | 35 | 63 | 49 | 172 | 56 | 51 | 54 |
| Lead (ug/L) | 30 ug/L | 0.5 | 8.6 | 6.6 | 7.6 | ND | 13.7 | 8.8 | 11.3 | 0.6 | 20.8 | 6.6 | 13.7 |
| MBAS Surfactants | 0.20 mg/L | 0.14 | 0.34 | 0.40 | 0.37 | 0.06 | 0.54 | 0.54 | 0.54 | 0.15 | 0.50 | 0.56 | 0.53 |
| NO3-N (mg-N/ L) | 2.25 mg-N/ L | 0.7 | 0.6 | 0.6 | 0.6 | 0.60 | 0.4 | 0.7 | 0.6 | 0.80 | 0.5 | 0.6 | 0.6 |
| PO4-P (mg-P/ L) | 0.12 mg-P/ L | 0.14 | 0.52 | 0.51 | 0.52 | ND | 0.56 | 0.72 | 0.64 | 0.06 | 0.77 | 0.76 | 0.77 |
| Potassium (mg/L) | 20 mg/ L | 6.5 | 5.9 | 5.4 | 5.7 | 6.1 | 5.4 | 7.0 | 6.2 | 4.9 | 12.3 | 10.7 | 11.5 |
| TSS (mg/L) | 500 mg/L | 2 | 66 | 28 | 47 | ND | 86 | 40 | 63 | ND | 264 | 102 | 183 |
| Turbidity (NTU) | 25 NTU | 5.1 | 46 | 25 | 36 | 0.7 | 24 | 23 | 24 | 15 | 76 | 44 | 60 |
| Urea (ug/L) | None currently | 47 | 155 | -- | 155 | 25 | 221 | -- | 221 | 47 | 224 | -- | 224 |
| Zinc (ug/L) | 200 ug/L | 13 | 100 | 111 | 106 | ND | 107 | 103 | 105 | 41 | 145 | 80 | 113 |

Seaside and Sand City 2019 MRSWMP Monitoring results.

Table results include the Dry Run (DR), First Flush time series (FF-A and FF-B) and FF results averaged for the two time series. Shaded boxes indicate that a Water Quality Objective (WQO) or Action Level was exceeded. ND= Non-detect; NF= No Flow; -- = Not included in MRSWMP monitoring.

| Analytes | WQO or Action Level | Bay Street | | | |
|------------------------------|---------------------|------------|---------------|---------------|------------|
| | | Dry Run | First Flush-A | First Flush-B | FF Average |
| Ammonia (mg/L) | 50 mg/L | NF | 0.79 | 0.63 | 0.71 |
| Color (Color Units) | 500 color units | NF | 150 | 150 | 150 |
| Copper (ug/L) | 30 ug/L | NF | 47 | 33 | 40 |
| <i>E. coli</i> (MPN/ 100 ml) | 235 MPN/ 100 ml | NF | 29100 | 24800 | 26950 |
| Enterococcus (MPN/ 100 ml) | 104 MPN/ 100 ml | NF | 24810 | 15290 | 20050 |
| Hardness mg/L | <10 and >2000 mg/L | NF | 38 | 31 | 35 |
| Lead (ug/L) | 30 ug/L | NF | 22.2 | 12.9 | 17.6 |
| MBAS Surfactants (mg/L) | 0.2 mg/L | NF | 0.44 | 0.50 | 0.47 |
| NO3-N (mg-N/ L) | 2.25 mg-N/ L | NF | 0.7 | 0.5 | 0.6 |
| PO4-P (mg-P/ L) | 0.12 mg-P/ L | NF | 0.47 | 0.38 | 0.43 |
| Potassium (mg/L) | 20 mg/ L | NF | 6.0 | 4.3 | 5.2 |
| TSS (mg/L) | 500 mg/L | NF | 126 | 131 | 129 |
| Turbidity (NTU) | 25 NTU | NF | 57 | 34 | 46 |
| Urea (ug/L) | None currently | NF | 144 | -- | 144 |
| Zinc (ug/L) | 200 ug/L | NF | 244 | 176 | 210 |

Appendix 4: Receiving Water Sampling

Appendix 4. Receiving Water Monitoring

Introduction

Collecting paired receiving water samples and discharge samples can provide a more complete understanding of the fate of common urban pollutants once they flow into the ocean during a major rainstorm. The 2016-2017 MRSWMP monitoring program added collection and analysis of receiving water samples from two sites in Pacific Grove during the First Flush which was continued into the 2018-2019 and now the 2019-2020 programs. Receiving water sites were selected based upon ease of sample collection and to compliment previous Areas of Special Biological Significance (ASBS) monitoring that was done at end of pipe and in receiving water in Pacific Grove. Two receiving water sites, 8th Street and Lovers, were monitored during the 2019-2020 winter season. Pacific Grove maintains and operates a dry weather diversion system that remained operational throughout the First Flush and winter season.

Methods

Sample collection protocols were the same as those used for all of the MRSWMP water quality monitoring events. Receiving water grab samples were collected using a 2-gallon bucket in ankle deep water at the location where outfall water flowed into the ocean. No field measurements were collected. All receiving water samples were analyzed for the same analytes as those for the MRSWMP outfall monitoring: nutrients (nitrate, orthophosphate, ammonia and urea), bacteria (*Escherichia coli* and enterococcus), metals (copper, lead and zinc) and total suspended solids, color, Methylene Blue Active Substances (MBAS) detergents, hardness (as CaCO₃), potassium and turbidity.

All results from this receiving water study are compared to actual receiving water standards established for beneficial uses in the ocean. All Water Quality Objectives and Action Levels and their accompanying sources are listed in Table A4.1. In cases where the Ocean Plan provides more protection of receiving water quality than those water quality objectives used for end of pipe monitoring, then the Ocean Plan Water Quality Objectives are used and noted.

Results

Receiving Water samples could not be collected on November 26, 2019 due to the time of night and severity of the storm sampled for First Flush. Receiving water samples from 8th Street and Lovers were instead collected by California Marine Sanctuary Foundation staff and a Monterey Bay National Marine Sanctuary volunteer along with paired end of pipe samples during another storm (FF #2) on January 9, 2020 starting at 9 am. The dry weather diversion was operational at Lovers and 8th Street however there was flow from the outfalls that reached the receiving water at the time of sampling. End of pipe samples were collected using the same protocols as for First Flush, with one exception: only one sample was collected. Receiving water results are presented for each site along with that site's FF #2 end of pipe results as a comparison. The FF #2 results are from single grab samples as are the receiving water results.

Table A4.1: Receiving Water Quality Objectives

| <u>Parameter (reporting units)</u> | <u>Water Quality Objectives</u> | <u>Source of Objective</u> |
|---|--|---|
| Ammonia (mg/L) | Not to exceed 50 | SWRCB NPDES MS4 General Permit |
| Color (color units) | Not to exceed 500 | SWRCB NPDES MS4 General Permit |
| Copper (µg/L) | Not to exceed 30 | California Ocean Plan 2015 |
| <i>E. coli</i> (MPN/100ml) | Not to exceed 235 ¹ | EPA Ambient Water Quality Criteria |
| Enterococcus (MPN/100ml) | Not to exceed 104 | EPA Ambient Water Quality Criteria |
| Hardness as CaCO ₃ (mg/L) | Not less than or = to 10 or greater than or = to 2,000 | SWRCB NPDES MS4 General Permit |
| Lead (µg/L) | Not to exceed 20 | California Ocean Plan 2015 |
| MBAS Detergents (mg/L) | Not to exceed 0.2 | Water Quality Control Plan for the Central Coast |
| Nitrate as N (mg/L) | Not to exceed 2.25 ² | Central Coast Ambient Monitoring Program (CCAMP) |
| Orthophosphate as P (mg/L) | Not to exceed 0.12 ³ | Central Coast Ambient Monitoring Program (CCAMP) |
| Potassium (mg/L) | Not to exceed 20 | SWRCB NPDES MS4 General Permit |
| Total Suspended Solids (TSS) (mg/L) | Not to exceed 500 ⁴ | Central Coast Ambient Monitoring Program (CCAMP) |
| Turbidity (NTU) | Not to exceed 225 | California Ocean Plan 2015 |
| Zinc (µg/L) | Not to exceed 200 ¹ | California Ocean Plan 2015 |

Note: Urea is not listed because it does not have a Water Quality Objective or Action Level.

¹ Environmental Protection Agency, Updated WQO.

² Central Coast Ambient Monitoring Program, Pajaro River Watershed Characterization Report 1998, rev 2003.

³ Williamson, The Establishment of Nutrient Objectives, Sources, Impacts and Best Management Practices for the Pajaro River and Llagas Creek, 1994.

⁴ Central Coast Ambient Monitoring Program, Salinas River Watershed Characterization Report 1999, rev. 2000.

8th Street Outfall and Receiving Water Monitoring

The 8th Street outfall empties directly on to a small boulder-strewn pocket beach that is seasonally used by newborn harbor seal pups and their mothers. The 8th Street outfall has a drainage area of 35 acres that is 100% residential. The 8th Street 2019 FF #2 outfall and receiving water results are listed in Table A4.2.

Overall, constituent concentrations decreased in seawater except for hardness and potassium which were above the Action Levels in 8th Street receiving water. However, the ocean contains quite a bit of calcium carbonate and potassium, so much so that calcium and potassium are within the top six constituents in seawater. Orthophosphate results were above the Action Level for the end of pipe sample only. *E. coli*, enterococcus and MBAS detergents were over the Water Quality Objectives (WQO) for both end of pipe and receiving water samples.

Table A4.2. 8th Street outfall and receiving water results for FF #2 on January 9, 2020 . Shaded boxes represent an exceedance of a Water Quality Objective or Action Level.

| Parameter | Units | Outfall Monitoring | | Receiving Water Monitoring | |
|--|------------------|--------------------|-------|----------------------------|-------|
| | | FF #2 Result | MDL | Result | MDL |
| Ammonia (mg/L) | 50 mg/L | 0.09 | 0.05 | 0.05 | 0.05 |
| Color (color units) | 500 color units | 70 | 10 | 15 | 1 |
| Copper- total (µg/L) | 30 µg/L | 28 | 5 | 10 | 5 |
| <i>Escherichia coli</i> (<i>E. coli</i>) (MPN/100ml) | 235 MPN/100 ml | 5,190 | 20 | 637 | 20 |
| Enterococcus (MPN/100 ml) | 104 MPN/100 ml | 5819 | 20 | 947 | 20 |
| Hardness (mg/L) | 10 to 2,000 mg/L | 67 | 10 | 4600 | 10 |
| Lead- total (µg/L) | 20 µg/L | 3 | 0.1 | 2.3 | 1 |
| MBAS Detergents (mg/L) | 0.2 mg/L | 0.40 | 0.10 | 0.24 | 0.10 |
| Nitrate as N (mg/L) | 2.25 mg/L | 0.30 | 0.04 | 0.10 | 0.01 |
| Orthophosphate as P (mg/L) | 0.12 mg/L | 0.20 | 0.005 | 0.06 | 0.005 |
| Potassium (mg/L) | 20 mg/L | 2.6 | 0.3 | 312 | 0.3 |
| Total Suspended Solids (mg/L) | 500 mg/L | 14 | 2 | 5 | 2 |
| Turbidity (NTU) | 25 NTU | 16 | 0.05 | 3.8 | 0.05 |
| Urea (µg/L) | No WQO | 57 | 8 | 14 | 8 |
| Zinc- total (µg/L) | 200 µg/L | 58 | 10 | 15 | 10 |

Lovers Outfall and Receiving Water Monitoring

The Lovers watershed is one of the largest watersheds in Pacific Grove at 240 acres and consists of a mix of residential (54%), commercial (1%), and some public lands or other uses (20%). The Lovers outfall empties right on to one of the most used beaches in Pacific Grove. Lovers 2019 FF #2 outfall and receiving water results are listed in Table A4.3.

As with 8th Street, overall constituent concentrations decreased in seawater except hardness and potassium which were above the Action Levels in Lovers receiving water. However, the ocean contains quite a bit of calcium carbonate and potassium, so much so that calcium and potassium are within the top six constituents in seawater. Orthophosphate results were above the Action Level for the end of pipe sample only. *E. coli*, enterococcus and MBAS detergents results were over the Water Quality Objectives for both end of pipe and receiving water samples.

Table A4.3. Lovers outfall and receiving water results for FF #2 on January 9, 2020. Shaded boxes represent an exceedance of a Water Quality Objective or Action Level.

| Parameter (units) | WQO | Outfall Monitoring | | Receiving Water Monitoring | |
|--|------------------|--------------------|-------|----------------------------|-------|
| | | FF #2 Result | MDL | Result | MDL |
| Ammonia (mg/L) | 50 mg/L | 0.09 | 0.05 | ND | 0.05 |
| Color (color units) | 500 color units | 100 | 10 | 10 | 1 |
| Copper- total (µg/L) | 30 µg/L | 28 | 5 | 9 | 5 |
| <i>Escherichia coli</i> (<i>E. coli</i>) (MPN/100ml) | 235 MPN/100 ml | 4028 | 20 | 290 | 20 |
| Enterococcus (MPN/100 ml) | 104 MPN/100 ml | 7569 | 20 | 637 | 20 |
| Hardness (mg/L) | 10 to 2,000 mg/L | 72 | 10 | 4860 | 10 |
| Lead- total (µg/L) | 20 µg/L | 6 | 0.1 | 1 | 1 |
| MBAS Detergents (mg/L) | 0.2 mg/L | 0.41 | 0.10 | 0.21 | 0.10 |
| Nitrate as N (mg/L) | 2.25 mg/L | 0.20 | 0.04 | 0.10 | 0.01 |
| Orthophosphate as P (mg/L) | 0.12 mg/L | 0.19 | 0.005 | 0.04 | 0.005 |
| Potassium (mg/L) | 20 mg/L | 2.8 | 0.3 | 336 | 0.3 |
| Total Suspended Solids (mg/L) | 500 mg/L | 32 | 2 | 11 | 2 |
| Turbidity (NTU) | 25 NTU | 24 | 0.05 | 3 | 0.05 |
| Urea (µg/L) | No WQO | 112 | 8 | ND | 8 |
| Zinc- total (µg/L) | 200 µg/L | 89 | 10 | 11 | 10 |

