URBAN CREEKS MONITORING REPORT

SAN MATEO COUNTY MRP PERMITTEES

Water Year 2023
(October 2022 – September 2023)

EXECUTIVE SUMMARY



Submitted in Compliance with
NPDES Permit No. CAS612008 (Order No. R2-2022-0018)
Provision C.8.h.iii

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program

A Program of the City/County Association of Governments of San Mateo County

March 31, 2024

CREDITS

This report is submitted by the participating agencies in the

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
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City of Belmont	**City of Half Moon Bay**	**City of San Carlos**
City of Brisbane	**Town of Hillsborough**	**City of San Mateo**
City of Burlingame	**City of Menlo Park**	**City of South San Francisco**
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City of East Palo Alto	**Town of Portola Valley**	**SM County Flood and Sea Level Rise Resiliency District**
	City of Redwood City	

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INTRODUCTION AND BACKGROUND

This *Urban Creeks Monitoring Report* (UCMR) for Water Year 2023 was prepared by the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). SMCWPPP is a program of the City/County Association of Governments (C/CAG) of San Mateo County. Each incorporated city and town in the county, the County of San Mateo, and the San Mateo County Flood and Sea Level Rise Resiliency District (OneShoreline) share a common National Pollutant Discharge Elimination System (NPDES) stormwater permit for San Francisco Bay Area municipalities referred to as the Municipal Regional Permit (MRP). The MRP was first adopted by the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) on October 14, 2009 as Order R2-2009-0074 (SFBRWQCB 2009; referred to as MRP 1.0). On November 19, 2015, the Regional Water Board updated and reissued the MRP as Order R2-2015-0049 (SFBRWQCB 2015; referred to as MRP 2.0). The Regional Water Board subsequently updated and revised the MRP as Order R2-2022-0018 (SFBRWQCB 2022; referred to as MRP 3.0), which took effect on July 1, 2022.

This UCMR, including all appendices and attachments, fulfills the requirements of Provision C.8.h.iii. of MRP 3.0 for reporting all data collected in Water Year 2023 (WY 2023; October 1, 2022 – September 30, 2023) pursuant to Provision C.8. Data presented in this report were submitted in electronic SWAMP-comparable formats by SMCWPPP to the Regional Water Board on behalf of San Mateo County Permittees and pursuant to Provision C.8.h.ii. of the MRP and may be obtained via the California Environmental Data Exchange Network (CEDEN). Data collected in prior water years (i.e., WYs 2012 – WY 2022) pursuant to Provision C.8 of the MRP are presented in annual Urban Creeks Monitoring Reports (SMCWPPP 2015, 2016, 2017, 2018, 2019, 2021, 2022, 2023a) and periodic Integrated Monitoring Reports (SMCWPPP 2014, 2020). The older data are also available on CEDEN.

Water quality monitoring required by Provision C.8 of the MRP is intended to evaluate the effectiveness of stormwater control actions; assess the condition of water quality in Bay Area receiving waters (creeks and the Bay); identify and prioritize stormwater runoff associated impacts, stressors, sources, and loads; identify appropriate management actions; and detect trends in water quality over time.

Provision C.8.a. (Compliance Options) of the MRP allows Permittees to address monitoring requirements through regional collaboration, their countywide or area-wide stormwater program, and/or individually. On behalf of San Mateo County Permittees, SMCWPPP conducts creek water quality monitoring and monitoring projects in collaboration with the Bay Area Municipal Stormwater Collaborative (BAMSC)[1] Regional Monitoring Coalition (RMC). Furthermore, SMCWPPP actively participates in the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP), which focuses on assessing Bay water quality and associated impacts. In compliance with Provision C.8.c. of the MRP (San Francisco Estuary Receiving Water Monitoring), SMCWPPP also provides financial contributions towards implementing the RMP.[2] Provision C.8.a.iii. allows Permittees to use third-party data meeting provision C.8.b. data quality objectives to satisfy monitoring requirements.

[1] The BAMSC was formed in 2021 upon dissolution of the Bay Area Stormwater Management Agencies Association (BASMAA) as a 501(c)(3) non-profit organization.

[2] See https://www.sfei.org/programs/sf-bay-regional-monitoring-program for details on the RMP.

Monitoring data were collected in accordance with the RMC Standard Operating Procedures (SOPs; BASMAA 2016), the RMC Quality Assurance Project Plan (QAPP; BASMAA 2020), and the Clean Watershed for a Clean Bay QAPP (BASMAA 2013). Where applicable, and in compliance with Provision C.8.b. of the MRP (Monitoring Protocols and Data Quality), methods described in the QAPPs and SOP are comparable with methods specified by the California Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Program Plan (QAPrP).

This UCMR consists of four "Parts" (A-D) that address the major sub-provisions of MRP Provision C.8. The following sections of this Executive Summary summarize each UCMR Part:

- Part A: Low Impact Development (LID) Effectiveness Monitoring
- Part B: Trash Monitoring
- Part C: Pesticides and Toxicity Monitoring
- Part D: Pollutants of Concern (POC) Monitoring

PART A: LOW IMPACT DEVELOPMENT (LID) MONITORING

Part A of the UCMR reports all LID Effectiveness monitoring activities conducted in WY 2023. Provision C.8.d identifies specific parameters and monitoring frequencies that must be achieved to address management questions related to pollutant removal efficiencies of LID facilities and minimum levels of maintenance necessary to maintain effectiveness. In San Mateo County, a minimum of 25 water quality sampling events must be conducted during the MRP 3.0 permit term, with an annual minimum of three events beginning WY 2024. Each sampling event must consist of paired flow- (or time) weighted composite samples of the LID facility influent and effluent collected with automated samplers.

Permittees are required to submit LID Monitoring Plans that demonstrate how the requirements in Provision C.8.d will be met. Permittees must submit their Monitoring Plans to the Regional Water Board Executive Officer (EO) for approval by May 1, 2023 and must begin implementation of their approved or conditionally approved Monitoring Plans by October 1, 2023. To assist with development and implementation of scientifically sound LID Monitoring Plans, provision C.8.d.ii requires Permittees to convene a Technical Advisory Group (TAG) which includes impartial science advisors and Regional Water Board staff.

In compliance with Provision C.8.h.iii.(1), Part A of the UCMR includes the LID Monitoring Status Report for WY 2023. Part A describes the outcomes of the two LID Monitoring TAG meetings convened in WY 2023; summarizes the SMCWPPP LID Monitoring Plan (SMCWPPP 2023b) that was submitted to the Regional Water Board on May 1, 2023, including the site selection process and the EO Conditional Approval; documents the permitting and equipment installation accomplishments; and, in compliance with Provision C.8.d.i.(1)(g), provides Program costs to develop and implement the LID Monitoring Plan in Fiscal Year 2022-23.

In WY 2023, two LID facilities that are part of the Brisbane Safe Routes to School and Green Infrastructure Project located in the City of Brisbane were instrumented with automated sampling equipment such that sampling could begin in WY 2024. In WY 2024, SMCWPPP will continue to comply with Provision C.8.d requirements and will collect a minimum of three paired samples at the Brisbane LID facilities.

PART B: TRASH MONITORING

Part B of the UCMR contains the Annual Trash Monitoring Progress Report for WY 2023, submitted in compliance with Provision C.8.h.iii.(2) of the MRP. The report, prepared collaboratively by members of the BAMSC Trash Monitoring Workgroup, describes Provision C.8.e Trash Monitoring requirements and how each BAMSC Program complied with the requirements during WY 2023. Provision C.8.e directs Permittees to conduct trash monitoring at MS4 outfalls and in receiving waters, and prescribes specific monitoring location criteria, methods and frequencies that must be achieved to address the management and monitoring questions listed in MRP 3.0.

B.1 Trash Outfall Monitoring

During WY 2023, the SMCWPPP collaborated with other members of the BAMSC Trash Monitoring Workgroup to convene the Trash Technical Advisory Group (TAG); developed a Regional Trash Outfall Monitoring Plan and QAPP that meets the requirements of Provision C.8.e; and initiated key tasks in preparation for the implementation of trash outfall monitoring, scheduled to start in October 2023.

The BAMSC Trash Monitoring Workgroup hosted two Trash TAG meetings on March 15 and May 22, 2023. The primary goal for both meetings was to inform the development of the Trash Outfall Monitoring Plan and QAPP. The BAMSC Trash Monitoring Workgroup submitted a Draft Trash Outfall Monitoring Plan and QAPP for TAG review on May 15, 2023. The documents were updated based on comments received and final versions of the Regional Trash Outfall Monitoring Plan (BAMSC 2023) and QAPP (AMS 2023) were submitted to the RWB for Executive Officer (EO) approval on July 31, 2024. These documents describe the overall monitoring approach, the process used to select monitoring sites, field methods for collecting trash and flow data, trash characterization, data evaluation and reporting procedures. On August 31, 2023, the RWB EO conditionally approved the Regional Trash Outfall Monitoring Plan and QAPP, requiring that an updated version with minor changes be submitted on July 31, 2024.

In San Mateo County, a minimum of two outfalls must be monitored with nets (or equivalent devices) during a minimum of three wet weather events per year beginning October 1, 2023. During WY 2023 and early WY 2024, SMCWPPP selected two outfalls for monitoring: an outfall at the upstream end of a drainage ditch to Pilarcitos Creek in the City of Half Moon Bay and an outfall at the upstream end of a drainage ditch to Steinberger Slough in City of San Carlos. Both outfalls are located in Caltrans Right-of-Way; therefore, SMCWPPP obtained encroachment permits from Caltrans for access to both sites in addition to a verbal approval from the City of Half Moon Bay and an encroachment permit from the City of San Carlos. In addition, a Streambed Alteration Agreement (SAA) permit was obtained from California Department of Fish and Wildlife (CDFW) to ensure that sensitive species, such as steelhead and red-legged frogs, would not be impacted from the monitoring project at the outfall location in Half Moon Bay.

Once all permits were obtained, SMCWPPP procured trash net devices from a contractor. The stainless-steel component of the trash net device was constructed and installed at both outfalls in September 2023. Due to supply chain issues, the trash nets were not expected to be available until mid-October 2023.

In early WY 2024, SMCWPPP plans to install pressure transducers at each to collect flow data as required under the MRP. Once transducers are installed, SMCWPPP will begin monitoring flow within each outfall

pipe at two-minute intervals over the course of the wet season. SMCWPPP will continue to comply with Provision C.8.e requirements by collecting a minimum of three trash samples at each location.

B.2 Trash Receiving Water Monitoring

During WY 2023, the City/County Association of Governments, San Mateo County (CCAG) released a Request for Proposals (RFP) for the Watching our Watersheds (WOW) Regional Trash Monitoring Project, which is funded by USEPA grant for the Water Quality Improvement Fund (WQIF). The WOW project will address MRP Provision C.8.e requirements for receiving water trash monitoring. The initial tasks that will be completed by the WOW project in WY 2024 will include an assessment of receiving water trash monitoring methods and equipment, and the selection of sites for monitoring that will begin in WY 2025. Work on these tasks began in December 2023 and an updated Trash Monitoring Plan is scheduled for completion in July 2024, consistent with MRP requirements.

PART C: PESTICIDES AND TOXICITY MONITORING

Part C of the UCMR presents all data collected in compliance with Provision C.8.g (Pesticides and Toxicity Monitoring). Toxicity testing provides a tool for assessing the toxic effects (acute and chronic) of all chemicals in water or sediment collected from receiving waters and allows the cumulative effect of the pollutant present in the sample to be evaluated. Because different test organisms are sensitive to different classes of chemicals, several different organisms are monitored. Sediment and water chemistry monitoring for a variety of potential pollutants is conducted synoptically with toxicity monitoring to provide preliminary insight into the possible causes of any toxicity observed. Provision C.8.g requires SMCWPPP to collect and analyze one dry season sample per year for toxicity and sediment chemistry. An additional two wet weather water samples, analyzed for toxicity and pesticides, are required during the permit term if collected as part of a regional RMC effort.

In WY 2023, SMCWPPP satisfied MRP 3.0 wet weather monitoring requirements by collecting two wet weather water samples (in Colma Creek and San Mateo Creek) as part of a regionally coordinated monitoring event. The Colma Creek monitoring location was selected because of its proximity to the Orange Memorial Park Regional Stormwater Capture Project in the City of South San Francisco. The monitoring site on San Mateo Creek is part of an ongoing, long-term, dry season sediment toxicity study by the State Water Quality Control Board's Stream Pollution Trends (SPoT) program. Water column samples from both sites were found to be significantly toxic to *H. azteca*, *C. dilutus* toxicity was observed in Colma Creek, and *C. dubia* toxicity was present in San Mateo Creek. However, Percent Effects were all less than 50%, so no follow up wet weather testing was required. Water column samples collected during wet weather sampling at the two sites were tested for pyrethroids, fipronil (including degradates), and imidacloprid pesticide concentrations. Pesticide concentrations were compared against United States Environmental Protection Agency (USEPA) benchmarks for chronic effects to freshwater invertebrates.[3] Some pyrethroid concentrations were found to be above the lowest EPA benchmark at both sites – a possible explanation for the *H. azteca* toxicity results. However, neither site had exceedances of the benchmarks for fipronil, fipronil degradates, or imidacloprid pesticides; and

[3] https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/aquatic-life-benchmarks-and-ecological-risk#aquatic-benchmarks

many pesticide analytes were found to be below the laboratory's reporting limit (J-flagged) or method detection limit (MDL)

The WY 2023 dry season sample was collected from Pilarcitos Creek in the City of Half Moon Bay, which was recently added to the Clean Water Act (CWA) Section 303(d) list of impaired water bodies for toxicity. Statistically significant toxicity for *P. promelas* (acute and chronic) and *C. dilutus* (acute) was observed in the water sample; however, the Percent Effects were below the MRP threshold of 50% for resampling, and the *P. promelas* findings may have been the result of pathogen related mortality. The sediment sample yielded no toxic results to test species. Pesticide concentrations in the sediment sample were all very low, with all values except for bifenthrin and fipronil reported below the MDL. These results do not show strong evidence of analyzed pesticides causing toxicity in Pilarcitos Creek.

In accordance with MRP requirements, a comprehensive QA/QC program was implemented by SMCWPPP covering all aspects of Pesticides and Toxicity monitoring was conducted during WY 2023. Overall, the results of the QA/QC review suggest that the data generated during WY 2023 Pesticides and Toxicity monitoring were of sufficient quality for the purposes of this program; however, some data were flagged in the project database based on the MQOs and DQOs identified in the QAPPs. In addition, the dry weather *P. promelas* results were flagged as questionable due to pathogen related mortality observed in one of the replicates.

In WY 2024, SMCWPPP will continue to comply with Provision C.8.g Pesticides & Toxicity Monitoring requirements by collecting a dry weather sample from Pilarcitos Creek.

PART D: POLLUTANTS OF CONCERN (POC) MONITORING

Part D of the UCMR reports all Pollutants of Concern (POC) monitoring data collected in WY 2023. POC monitoring required by MRP Provision C.8.f is intended to assess inputs of POCs to the Bay from local tributaries and urban runoff, provide information to support implementation of Total Maximum Daily Load (TMDL) water quality restoration plans and other pollutant control strategies, assess progress toward achieving wasteload allocations (WLAs) for TMDLs, help resolve uncertainties associated with loading estimates for POCs, and provide information to assess whether receiving water limitations (RWLs) are achieved. In WY 2023, SMCWPPP conducted POC monitoring for PCBs and mercury in January, February, and August 2023. The MRP-required yearly minimum number of samples was met for all POCs.

POC Monitoring in San Mateo County is conducted by SMCWPPP and its water quality partners, including the members of the RMC, the RMP, and the SWAMP SPoT monitoring program. Figure E.1 illustrates locations of monitoring stations associated with POC monitoring conducted by SMCWPPP and its water quality partners in compliance with MRP Provision C.8.f.

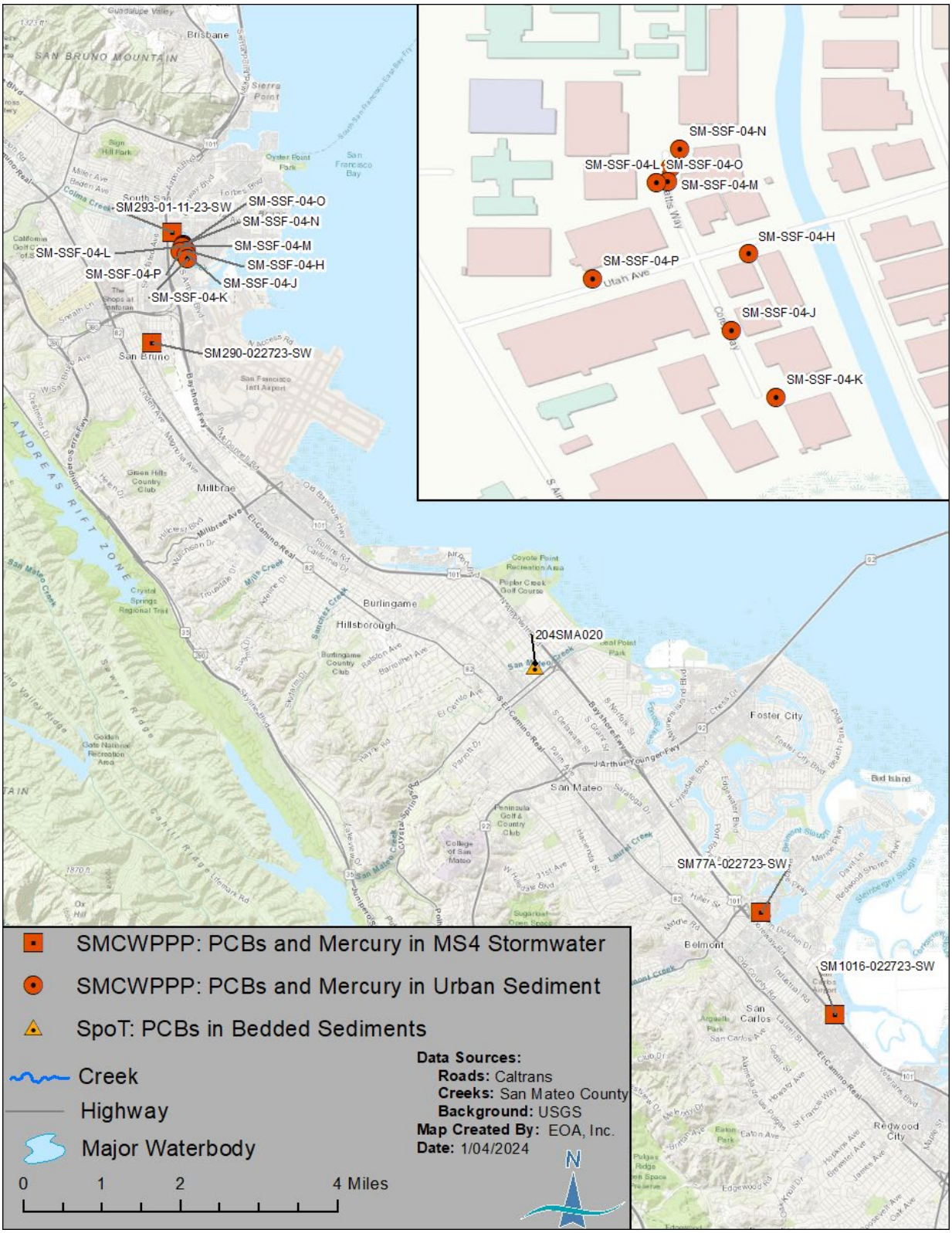

Figure E.1. POC Monitoring Stations in San Mateo County, WY 2023.

D.1 PCBs and Mercury

In WY 2023, SMCWPPP collected a total of 12 samples for PCBs and mercury analysis.

- Eight MS4 sediment samples (defined as street dirt, surface soil, or sediment collected from streets, gutters, storm drain inlets, and other MS4 structures) were collected to inform Management Question #2 (Contributions to Bay Impairment). A sample is considered highly elevated if it has a PCBs concentration over 0.5 mg/kg, and moderately elevated if it has a concentration from 0.2 to 0.5 mg/kg. Similarly for mercury, an MS4 sediment sample is considered highly elevated if it is over 1.0 mg/kg, and moderately elevated if it has a concentration from 0.3 to 1.0 mg/kg. For both PCBs and mercury, concentrations above 1 mg/kg are considered confirmation of a source. These thresholds are used by the BAMSC as approximate benchmarks for identifying areas that should be considered for future investigation. None of the WY 2023 PCBs samples exceeded these thresholds; however, two samples exceeded the 0.3 mg/kg mercury threshold.

- Four stormwater composite samples were collected to inform Management Question #4 (Loads and Status). These samples were collected within the MS4 at or near the bottom of stormwater catchments to quantify the concentrations of pollutants being discharged during a storm event. The method in which these samples are collected (i.e. a time composite of aliquots collected via grab sampling) approximates an event mean concentration (EMC) for the sampled storm event. The water concentration is divided by the suspended sediment concentration to calculate a "particle ratio" in units of mg/kg, and compared to the sediment concentration thresholds for identifying areas for future investigation. One sample collected in the City of Belmont had a moderately elevated PCBs particle ratio and one sample collected in the City of San Bruno had a highly elevated particle ratio.

In accordance with MRP requirements, a comprehensive QA/QC program was implemented by SMCWPPP covering all aspects of POC monitoring that was conducted during WY 2023. Overall, the results of the QA/QC review suggest that the data generated during WY 2023 POC monitoring were of sufficient quality for the purposes of this program. While some data were flagged in the project database based on the MQOs and DQOs identified in the QAPPs, none of the data were rejected.

D.2 Emerging Contaminants

Emerging contaminants are a diverse group of chemicals and compounds, broadly defined as synthetic or naturally occurring chemicals that are not regulated or commonly monitored in the environment but have the potential to enter the environment and cause adverse ecological or human health impacts. The MRP allows for Permittees to satisfy the emerging contaminant monitoring requirements through augmentation of the RMP's Emerging Contaminants Monitoring Strategy in the amount of $100,000 per year for all Permittees combined. SMCWPPP and its RMC partners have elected to exercise this option and are working through the RMP to identify emerging contaminant analytes and monitoring strategies to address priority management questions.

D.3 Receiving Water Limitations Monitoring

RWL monitoring required in the MRP must be addressed via the collection of at least four samples during the wet season and one sample during the dry season. Samples must be analyzed for copper,

zinc, fecal indicator bacteria (FIB), and any additional analytes identified based on assessment of the potential that discharges may result in receiving waters approaching or exceeding water quality objectives (WQOs). The RWLs Assessment Report (i.e., Monitoring Plan) required by provision C.8.h.iv.(2) was developed as a regional effort through the RMC and was submitted with the WY 2022 UCMR (SCVURPPP 2023a). It describes the regional approach to RWL monitoring, including the process used to identify the appropriate analytes to include in addition to those listed in Table 1.1 of provision C.8, the locations of regionally representative sampling sites, monitoring methods, and relevant WQOs against which to compare monitoring data regional approach to RWLs monitoring and the list of additional analytes that may result in exceedances of WQOs. On June 12, 2023, the Regional Water Board Executive Officer issued a letter of Conditional Approval of the RWL Assessment Report (Conditional Approval Letter) expanding the analyte list to include PAHs and requiring demonstration of the representativeness of the selected monitoring locations. In order to satisfy the second condition, MRP Permittees identified and characterized watersheds in Alameda, Contra Costa, San Mateo, and Santa Clara counties that drain to San Francisco Bay and compared them to the selected monitoring locations. The results of the analysis are described in the RWL Assessment Report Addendum which is included with UCMR Part D.

D.4 Recommendations for WY 2024 POC Monitoring

In WY 2024, SMCWPPP will continue to collect and analyze POC samples in compliance with MRP Provision C.8.f. PCBs and mercury monitoring will focus on management questions related to the identification of watershed source areas contributing to Bay impairments, management action effectiveness, loads, and trends. SMCWPPP will also begin monitoring for RWL analytes at one receiving water station in San Mateo County. In addition, SMCWPPP will continue to provide financial contributions and participate in RMP workgroups focused on monitoring POCs.

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