Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Watershed Monitoring and Assessment Program

Urban Creeks Monitoring Report
Executive Summary

Water Year 2021 (October 2020 – September 2021)

Submitted in compliance with Provision C.8.h.iii of NPDES Permit No. CAS612008,
Order No. R2-2015-049

March 31, 2022

EOA inc.

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Table E.1. Water Year 2021 Creek Status Monitoring Station Summary Table

In compliance with provision C.8.h.iii(1), this table of all Creek Status Monitoring stations sampled by SCVURPPP in Water Year 2021 is provided immediately following the Table of Contents.

Station ID	Watershed	Creek Name	Latitude	Longitude	Bioassessment, Nutrients, General WQ	Chlorine	Pesticides & Toxicity	Temp [1]	Cont. WQ [2]	Pathogen Indicators
AC002	Guadalupe River	Alamitos Creek	37.22229	-121.85051	X	X				
AC004	Guadalupe River	Alamitos Creek	37.17409	-121.82406	X	X				
CC001	Guadalupe River	Arroyo Calero	37.21349	-121.83208	X	X				
CC003	Guadalupe River	Arroyo Calero	37.2034	-121.81686	X	X				
GC003	Guadalupe River	Guadalupe Creek	37.23006	-121.90285	X	X				
GC004	Guadalupe River	Guadalupe Creek	37.21836	-121.90883	X	X				
GC006	Guadalupe River	Guadalupe Creek	37.20488	-121.89643	X	X				
LG002	Guadalupe River	Los Gatos Creek	37.31601	-121.90302	X	X				
LG003	Guadalupe River	Los Gatos Creek	37.30155	-121.91856	X	X			X	
LG004	Guadalupe River	Los Gatos Creek	37.29109	-121.93488	X	X			X	
205R01930	Guadalupe River	Los Gatos Creek	37.26288	-121.95201	X	X			X	
205R03530	Guadalupe River	Los Gatos Creek	37.25120	-121.9650	X	X			X	
205R01706	San Tomas Aquino	Saratoga Creek	37.26554	-122.02575	X	X				
205R02474	San Tomas Aquino	Saratoga Creek	37.2578	-122.0348	X	X				
205R03562	San Tomas Aquino	Saratoga Creek	37.2524	-122.04504	X	X				
205R00170	San Tomas Aquino	Saratoga Creek	37.24844	-122.07084	X	X				
SC002	Stevens Creek	Stevens Creek	37.32458	-122.06157	X	X				
SC004	Stevens Creek	Stevens Creek	37.31429	-122.06454	X	X				
SC006	Stevens Creek	Stevens Creek	37.30298	-122.07466	X	X				
205STE095	Stevens Creek	Stevens Creek	37.27954	-122.07378	X	X				
205COY121	Coyote Creek	Upper Penitencia Cr	37.3953	-121.8280				X		
205COY132	Coyote Creek	Upper Penitencia Cr	37.3931	-121.8158				X		
205COY135	Coyote Creek	Upper Penitencia Cr	37.3965	-121.8045				X		
205COY140	Coyote Creek	Upper Penitencia Cr	37.4012	-121.7953				X		
205COY142	Coyote Creek	Upper Penitencia Cr	37.4036	-121.7925				X		
205COY145	Coyote Creek	Upper Penitencia Cr	37.4047	-121.7917				X		
205AAG010	Coyote Creek	Arroyo Aguague	37.4011	-121.7888				X		
205AAG015	Coyote Creek	Arroyo Aguague	37.4008	-121.7860				X		
205AAG025	Coyote Creek	Arroyo Aguague	37.3971	-121.7858				X		
205LGA420	Guadalupe River	Los Gatos Creek	37.2203	-121.9830						X
205LGA400	Guadalupe River	Los Gatos Creek	37.2388	-121.9708						X

Station ID	Watershed	Creek Name	Latitude	Longitude	Bioassessment, Nutrients, General WQ	Chlorine	Pesticides & Toxicity	Temp [1]	Cont. WQ [2]	Pathogen Indicators
205LGA060	Guadalupe River	Los Gatos Creek	37.2908	-121.9350						X
205STE065	Stevens Creek	Stevens Creek	37.3136	-122.0640						X
205STE064	Stevens Creek	Stevens Creek	37.3173	-122.0620						X
205STE021	Stevens Creek	Stevens Creek	37.4098	-122.0691			X			
205STQ010	San Tomas Aquino	San Tomas Aquino	37.3886	-121.9685			X			

[1] Temperature monitoring was conducted continuously (i.e., hourly) April through September.

[2] Continuous water quality monitoring (temperature, dissolved oxygen, pH, specific conductivity) was conducted during two 1 to 2-week periods (spring and summer).

Executive Summary – Introduction and Background

This *Urban Creeks Monitoring Report* (UCMR) for Water Year 2021 was prepared by the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP or Program), on behalf of its 15 member agencies (13 cities/towns, the County of Santa Clara, and the Santa Clara Valley Water District). SCVURPPP member agencies are subject to the National Pollutant Discharge Elimination System (NPDES) stormwater permit for Bay Area municipalities referred to as the Municipal Regional Permit (MRP). The MRP was first adopted by the San Francisco Regional Water Quality Control Board (SFRWQCB or Regional Water Board) on October 14, 2009 as Order R2-2009-0074 (SFRWQCB 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 (SFRWQCB 2015; referred to as MRP 2.0). The next iteration of the MRP (i.e., MRP 3.0) is currently under development and is anticipated to become effective July 1, 2022.

This UCMR, including all appendices and attachments, fulfills the requirements of provision C.8.h.iii of the MRP for reporting all data collected in Water Year 2021 (WY 2021; October 1, 2020 – September 30, 2021) pursuant to provision C.8. Data presented in this report were submitted in electronic SWAMP-comparable formats by SCVURPPP to the Regional Water Board on behalf of SCVURPPP 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 2020) pursuant to provision C.8 of MRP 1.0 and MPR 2.0 are presented in annual Urban Creeks Monitoring Reports (SCVURPPP 2015, 2016, 2017, 2018, 2019, 2021) and periodic Integrated Monitoring Reports (SCVURPPP 2014, 2020). The older data are also available on CEDEN.

Water quality monitoring required by provision C.8 of the MRP is intended to 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 and the effects of stormwater control measure implementation.

Provision C.8.a (Compliance Options) of the MRP allows Permittees to address monitoring requirements through a "regional collaborative effort," their countywide stormwater program, and/or individually. On behalf of Co-permittees, SCVURPPP conducts creek water quality monitoring and monitoring projects in in collaboration with the Bay Area Municipal Stormwater Collaborative (BAMSC)[1] Regional Monitoring Coalition (RMC). Furthermore, SCVURPPP 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), SCVURPPP also provides financial contributions towards implementing the RMP.[2]

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

[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.

This UCMR consists of three "Parts" (A-C) that address the major sub-provisions of MRP provision C.8 (Water Quality Monitoring). The following sections of this Executive Summary summarize each UCMR Part:

- Part A: Creek Status and Pesticides & Toxicity Monitoring
- Part B: Stressor/Source Identification Projects
- Part C: Pollutants of Concern Monitoring

Part A: Creek Status and Pesticides & Toxicity Monitoring

Part A of the UCMR presents all data collected in compliance with provision C.8.d (Creek Status Monitoring) and provision C.8.g (Pesticides & Toxicity Monitoring) during WY 2021. The monitoring strategy implemented by SCVURPPP in compliance with these provisions is consistent with the BASMAA RMC's Creek Status and Long-Term Trends Monitoring Plan (BASMAA 2012). The strategy includes regional ambient/probabilistic monitoring and local targeted monitoring. The probabilistic monitoring design was developed to remove bias from site selection such that ecosystem conditions can be objectively assessed on local (i.e., Santa Clara Basin) and regional (i.e., RMC) scales. The targeted monitoring design focuses on sites selected based on the presence of significant fish and wildlife resources, as well as historical and/or recent indications of water quality concerns. Monitoring results are compared to "triggers" listed in the MRP. Some triggers are equivalent to regulatory Water Quality Objectives (WQOs), while others are thresholds above (or below) which potential impacts to aquatic life or other beneficial uses may occur. Pursuant to provision C.8.e, sites where triggers are exceeded (or not met) are considered for future stressor/source identification (SSID) projects.

A.1 Bioassessment

During WY 2021, SCUVRPPP conducted biological assessments at 20 targeted creek sites, all classified as "urban" in the RMC sample frame. Bioassessments include the collection of benthic macroinvertebrate (BMI) and algae samples, measurement of general water quality and physical habitat parameters, and collection of water samples for laboratory analysis (i.e., nutrients). The California Stream Condition Index (CSCI), a statewide tool that translates benthic macroinvertebrate data into an overall measure of creek health, was used to assess biological condition.

Of the 20 targeted bioassessment sites monitored in WY 2021, 13 were sited to coincide with sites that are regularly monitored by Valley Water to assess the condition of steelhead populations (some of these sites had also previously been monitored by SCVURPPP for bioassessment), six sites were at previously monitored sites to build time-series data, and one was sited to fill longitudinal data gaps along Stevens Creek. CSCI scores ranged from 0.48 to 1.07, with 16 sites scoring below the MRP trigger of 0.795, which corresponds to the two lower condition categories *(likely altered* and *very likely altered)*. Low CSCI scores are related to impacts to physical habitat typical for urbanized areas, such as creek channel modifications (e.g., lining with concrete) and contributing watersheds with high percentages of impervious surface. The four sites with CSCI scores above 0.795 all have relatively low impervious area in their contributing watersheds (i.e., one to two percent). Bioassessment sites and condition categories based on CSCI scores are shown in Figure E.1.

Comparison of CSCI and other biological condition index scores with Valley Water fish community data found no obvious relationships. However, review of the BMI taxonomic data suggests that all sites with observed population of steelhead trout supported either abundant numbers (≥10% total individuals) of preferred food sources (i.e., mayflies, stoneflies, worms, amphipods) or an overall abundance of total BMIs per square meter (>17,000 individuals).

CSCI scores measured in WY 2021 at 13 sites were compared to scores from prior years (WY 2013 through WY 2019). WY 2021 was an interesting year for comparison because it was the driest year in 30 years and followed another year with very low precipitation (i.e., WY 2020). However, there were no obvious trends in CSCI scores across the 13 sites. Most WY 2021 CSCI scores were within 0.07 points of the original score. Four sites had scoring differences of over 0.15, with half having higher scores in WY 2021 and half having lower scores. Biological conditions can be influenced by many factors that change from year to year, including timing and magnitude of storm events during the sampling index period, variable antecedent conditions (e.g., precipitation, temperature), and changes in management actions (e.g., operations related to water releases from reservoirs or diversions). It is not clear, especially with such a small sample size, what factors, if any, might be associated with changes in biological conditions at these watersheds/sites.

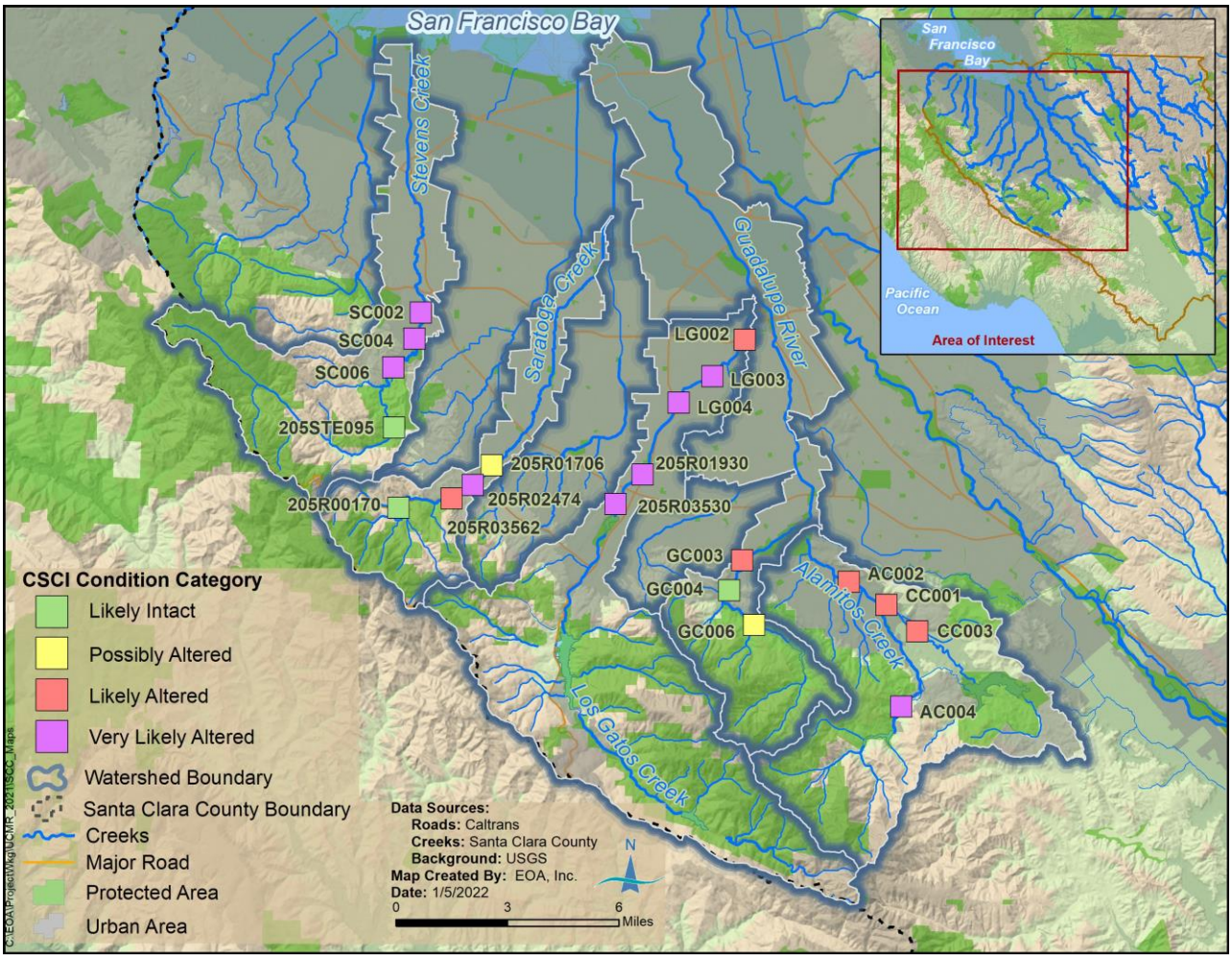

Figure E.1. Biological condition categories based on CSCI scores for 20 bioassessment sites in Santa Clara County, WY 2021.

A.2 Continuous Temperature and Water Quality Monitoring

Continuous monitoring of water temperature and general water quality in WY 2021 was conducted in compliance with provision C C.8.d.iii – iv of the MRP. Hourly temperature measurements were recorded at nine sites in the Upper Penitencia Creek watershed from April through September, the same sites that were targeted in WY 2020. General water quality parameters (specific conductance, dissolved oxygen, pH, and temperature) were recorded continuously (15-minute interval) at four sites in Los Gatos Creek during two 1 to 2-week periods in May/June (Event 1) and/or July (Event 2).

Continuous temperature monitoring was conducted along stream reaches in Upper Penitencia Creek and its tributary Arroyo Aguague within Alum Rock Park. These reaches were targeted for temperature monitoring because they convey perennial flow and support rearing and spawning habitat for steelhead and other native fishes (Stillwater 2006). Although the MRP maximum weekly average temperature (MWAT) trigger threshold of 17°C was exceeded in WY 2021 at seven of the nine stations, there were very few exceedances of the instantaneous maximum MRP trigger of 24°C. The MWAT temperature exceedances resulted in sites being placed on the list of trigger exceedances that is maintained by the Program. However, these MWAT trigger exceedances may not be of concern in Santa Clara County because the threshold was developed for streams of the Pacific Northwest, a cooler region with inherently lower water temperatures. WY 2021 temperature monitoring results were similar to those recorded in WY 2020.

Continuous general water quality monitoring was conducted at four stations in Los Gatos Creek. This creek was targeted because it supports a cold water fish community, it has not previously been targeted for this type of monitoring, and it was recently added to the Clean Water Act (CWA) Section 303(d) list as being impaired for water temperature. One of the three sites monitored during Event 1 was found to be dry in July, and was replaced by an alternate site. Specific conductance and dissolved oxygen results followed expected patterns and did not exceed the MRP triggers. Temperature and dissolved oxygen results also followed expected diurnal patterns; however, the MRP triggers for both of these parameters were exceeded at all sites.

A.3 Pathogen Indicator Monitoring

In WY 2021, pathogen indicator samples (i.e., enterococci, *E. coli*) were collected during one monitoring event at five stations in Santa Clara County that coincide with public parks. Four of the stations had also been monitored in prior years. The MRP trigger threshold for E. coli was not exceeded, but the enterococci trigger was exceeded at two sites. The overall goal of pathogen indicator monitoring is to assess whether WQOs are being met and whether creeks are supportive of water contact recreation (REC-1) beneficial uses.

It is important to recognize that pathogen indicators do not directly represent actual pathogen concentrations and do not distinguish among sources of bacteria. Sources of pathogen indicator bacteria in the targeted creeks may include homeless encampments, wildlife, livestock, pets, leaking septic systems/sanitary sewers, and regrowth of bacteria in the environment. It is the human sources of bacteria that are of primary concern for REC-1 health risks. As a result, pathogen indicator results that exceed WQOs may not indicate that a health risk is present, and therefore should be interpreted cautiously.

A.4 Chlorine Monitoring

Free chlorine and total chlorine residual were measured at 20 sites in WY 2021 concurrently with bioassessment surveys. In WY 2021, there was one exceedance of the MRP trigger for chlorine (0.1 mg/L). It was immediately followed up by County staff and a likely cause was identified (i.e., a leaking fire hydrant) and addressed. Chlorine residual is generally not a concern in Santa Clara Valley urban creeks.

A.5 Pesticides and Toxicity Monitoring

Toxicity testing of water and sediment samples and sediment chemistry monitoring, collectively referred to as pesticides and toxicity monitoring, was conducted during WY 2021 in compliance with provision C.8.g of the MRP. Samples were collected from Stevens Creek and San Tomas Aquino Creek at the same stations that were monitored for pesticides and toxicity during WY 2016 to WY 2020, building a long-term dataset.

WY 2021 Results

In WY 2021, statistically significant toxicity to *Ceriodaphnia dubia* (reproduction) was observed in the water sample collected from Stevens Creek; the sample value was one percent abovethe MRP trigger criterion of 50 percent. Statistically significant toxicity to *Chironomus dilutus* (survival) was observed in the sediment sample collected from San Tomas Aquino Creek. Therefore, follow-up samples for these test organisms were required. However, because the preliminary lab report reversed the station names, the wrong instructions were given. Stevens Creek was resampled for *C. dilutus* (survival) toxicity in sediment, and San Tomas Aquino Creek was resampled for *C. dubia* (reproduction) toxicity in water. The follow-up samples were not significantly toxic to the test organisms. These sites will be resampled in WY 2022.

Pesticide concentrations in the WY 2021 sediment samples were all very low, most below the method detection limit (MDL). The exceptions were bifenthrin, cyfluthrin, and deltamethrin/tralomethrin which were detected in the Stevens Creek sample and bifenthrin and cyfluthrin which were detected in the San Tomas Aquino Creek sample. When normalized to total organic carbon (TOC), the sum of the toxicity unit (TU) equivalents calculated for these pyrethroid pesticides were 0.51 in Stevens Creek and 0.69 in San Tomas Aquino.

WY 2016 – WY 2021 Data Summary

The results of pesticides and toxicity monitoring conducted in San Tomas Aquino and Stevens Creek during WY 2016 through WY 2021 were analyzed to identify trends.

- Toxicity to *H. azteca*, a test organism known to be sensitive to pyrethroid pesticides, was not observed in dry season sediment or water samples but was observed in wet weather water samples collected in WY 2018.
- Toxicity to *C. dilutus*, a test organism known to be sensitive to neonicotinoids (e.g., imidacloprid) and fipronil, was observed in sediment and water samples collected during the dry season, although only twice with a Percent Effect exceeding the MRP threshold for resampling, both times in San Tomas Aquino Creek sediment samples.
- Of the nineteen dry season samples where significant toxicity was observed, nine were water samples with *C. dubia* reproduction toxicity. *C. dubia* is a water flea that is sensitive to a broad range of aquatic contaminants. However, the specific cause of the

chronic *C. dubia* toxicity in San Tomas Aquino and Stevens Creek is unknown, and not seemingly explained by the synoptic sediment chemistry results. It is possible that the chronic *C. dubia* toxicity observed in water samples are false positives resulting from inconsistencies in laboratory quality assurance (QA). Statewide, there have been other reports of unexplained chronic *C. dubia* toxicity, and the State Water Board is currently carrying out a Special Study to examine the issue.

The pesticides and toxicity data collected from WYs 2014 through 2021 provide a reference to inform management decisions regarding water quality improvement in Santa Clara County watersheds and guide the planning of future monitoring in the area.

A.6 Recommendations

Impacts to urban streams identified through creek status monitoring are likely the result of long-term changes in stream hydrology, channel geomorphology, in-stream habitat complexity, and other modifications associated with the urban development and associated impervious surfaces, and, to a lesser extent, pollutant discharges typically found in urban watersheds. SCVURPPP Co-permittees are actively implementing many stormwater management programs to address these stressors and pollutants found in local creeks and the Bay, with the goal of protecting these natural resources and their Beneficial Uses. Through the continued implementation of MRP-associated and other watershed management programs (e.g., stream restoration and flow augmentation), SCVURPPP anticipates that stream conditions and water quality in local creeks will continue to improve over time.

Recommendations presented in Part A of the WY 2021 UCMR are directed towards the implementation of monitoring requirements in provisions C.8.d and C.8.g through the remainder of term during which MRP 2.0 remains in effect. At this time, it is anticipated that MRP 2.0 will be replaced with MRP 3.0 in July 2022. Thus, the current monitoring requirements will likely be in effect throughout most of WY 2022. SCVURPPP's anticipated monitoring approach during WY 2022 will include the following:

- The probabilistic sample draw for urban sites in Santa Clara County has been exhausted. Therefore, SCVURPPP will select all 20 WY 2022 bioassessment sites on a targeted basis according to guidance provided by Regional Water Board staff. Targeted sites will be selected to fill in spatial data gaps, undertake watershed studies, and/or assess the impact of land use changes on biological condition.

- Continuous monitoring for temperature and general water quality has been an effective tool in supporting SSID studies and evaluating cold water habitat. It can also complement targeted Biological Condition Assessments. The Program recommends continued implementation of this approach through the remainder of the MRP 2.0 permit term.

- The Program will continue to comply with provision C.8.d.ii requirements by measuring free and total chlorine in 20 samples. Measurements will be made synoptic with bioassessment monitoring.

- Pesticides and Toxicity Monitoring will be conducted during the dry season at the same two stations targeted in WYs 2016 through 2021: Stevens Creek and San Tomas Aquino Creek. The full dataset from these stations (WY 2016 – WY 2022) will be evaluated in the WY 2022 UCMR.

Part B: Stressor/Source Identification (SSID) Projects

Part B of the UCMR provides a status update on SSID projects. In compliance with the MRP, Permittees must initiate a minimum number of SSID projects during the permit term. SSID projects are intended to identify and isolate potential sources and/or stressors associated with observed water quality concerns. These projects are intended lead to action(s) that alleviate stressors and reduce sources of pollutants. During MRP 2.0, SCVURPPP initiated two Santa Clara Valley-specific SSID projects and participated in one regional project. These SSID projects are briefly summarized below:

- The Coyote Creek Toxicity SSID project was triggered by the recommended listing of Coyote Creek for acute toxicity in sediment in the 2016 Integrated Report (303(d) List/305(b) Report for the San Francisco Bay Region. The Coyote Toxicity SSID monitoring design included an evaluation of sediment chemistry and toxicity testing during the dry season over a two-year period (WY 2018 and WY 2019). The results of this SSID Study and review of toxicity data collected over the past 14 years suggest that sediment toxicity is generally not present in Coyote Creek. The Final Coyote Creek Toxicity SSID Project report was submitted to the Regional Water Board on March 31, 2020. In a comment letter dated December 32, 2021, the Regional Water Board approved completion of the SSID project contingent on submittal of a Revised Report which focused the discussion on acute, rather than chronic, toxicity. The Revised Report also contains appendices compiling historical data that were cited in the report. With submittal of the Revised Coyote Creek Toxicity SSID Project Report (included with Part B of the UCMR), the Coyote Creek Toxicity SSID Project is considered complete.

- The Lower Silver Creek – Thompson Creek SSID project was triggered by creek status/condition data suggesting that several stream reaches in the watershed have reduced biological integrity and relatively high nutrient concentrations. In WY 2019, SCVURPPP developed a work plan designed to investigate nutrient sources, the relationship between nutrients and biological condition, and the extent of eutrophic conditions. Monitoring in support of the project was conducted in 2019 through 2021. The SSID study confirmed, that nutrient concentrations are elevated above thresholds identified for eutrophic conditions (Dodds and Smith 2016) throughout much of the watershed. The Final Lower Silver Creek – Thompson Creek SSID Project Report is included with Part B of this UCMR.

- The Regional SSID Project - Electrical Utilities as a Potential PCBs Source to Stormwater in the San Francisco Bay Area – was triggered by fish tissue monitoring in the Bay that led to the Bay being designated as impaired on the Clean Water Act (CWA) Section 303(d) list and the adoption of a Total Maximum Daily Load (TMDL) for PCBs in 2008. Subsequent PCBs monitoring by the BASMAA RMC partners and the RMP suggests that diffuse sources of PCBs are present throughout the region, with one potential source being releases and spills from electrical utility equipment. The work plan, developed in WY 2018, presents a framework to investigate electrical utility equipment as a source of PCBs to urban stormwater runoff and identify appropriate actions and control measures to reduce the water quality impacts of this source. In WYs 2019 and 2020, the RMC partners gathered information from municipally-owned electrical utilities in the MRP area to improve current estimates of PCBs loadings to MS4s and identify opportunities to develop improved spill response and reporting procedures. The final project report was submitted with the Program's FY 2019/20 Annual Report on September 30, 2020.

Consistent with MRP procedures, SCVURPPP seeks Regional Water Board Executive Officer (EO) confirmation of the completion of the Coyote Creek Sediment Toxicity SSID Study and approval of the completion of the Lower Silver – Thompson Creek SSID Study. Likewise, the RMC awaits comments and/or EO approval for completion of the Electrical Utilities SSID Study.

Part C: Pollutants of Concern Monitoring

Part C of the UCMR reports and interprets all Pollutants of Concern (POC) monitoring data collected in WY 2021. POC monitoring is required by provision C.8.f of the MRP. POC monitoring is intended to assess inputs of POCs to the Bay from local tributaries and urban runoff, provide information to support implementation of TMDL water quality restoration plans and other pollutant control strategies, assess progress toward achieving wasteload allocations (WLAs) for TMDLs, and help resolve uncertainties associated with loading estimates for POCs. In WY 2021, SCVURPPP conducted POC monitoring for PCBs, mercury, copper and nutrients. The MRP-required yearly minimum number of samples was met or exceeded for all POCs.

POC Monitoring in the Santa Clara Valley is conducted by SCVURPPP and its water quality partners, including the BAMSC/BASMAA RMC, the RMP, and the SWAMP Stream Pollution Trend (SPoT) monitoring program. Figure E.2 illustrates locations of monitoring stations associated with POC monitoring conducted by SCVURPPP and its water quality partners in compliance with MRP provision C.8 in WY 2021.

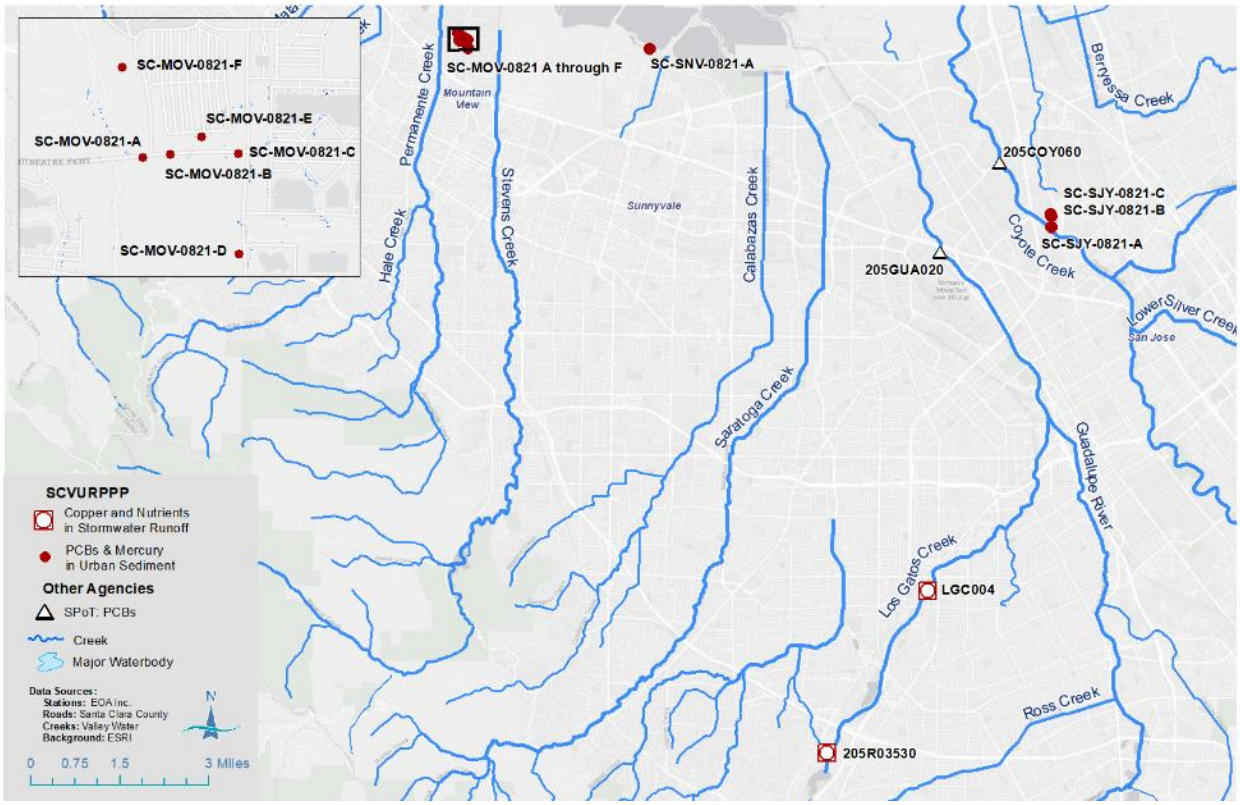

Figure E.2. Locations of POC-monitoring stations in Santa Clara County sampled in WY 2021.

C.1 PCBs and Mercury

PCBs and mercury monitoring in WY 2021 continued to focus primarily on identification of sources and source areas to the MS4 and San Francisco Bay. In WY 2021, SCVURPPP targeted high and moderate opportunity Catchments of Interest for reconnaissance-style screening monitoring to identify locations with elevated PCBs and mercury (i.e., priority Watershed Management Areas (WMAs)). SCVURPPP also conducted monitoring in priority WMAs as part of ongoing source property investigations. These investigations are conducted to identify specific properties within a catchment that contribute elevated PCBs or mercury to the MS4. “Total PCBs” were calculated as the sum of the RMP 40 congeners. An MS4 sediment sample, defined as street dirt, surface soil, or sediment collected from streets, gutters, storm drain inlets, and other MS4 structures 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 (e.g., targeted source property investigations that involve records review, additional sampling, etc.), and for identifying source properties. There are currently no similar thresholds established for classifying or prioritizing PCBs or mercury concentrations in stormwater. Therefore, the Program is applying the BAMSC sediment concentration thresholds to stormwater particle ratio data. The “PCB Particle Ratio” and “Hg Particle Ratio” are calculated by dividing Total PCBs and Total Mercury by suspended sediment concentration (SSC). Particle Ratios address the fact that these pollutants are generally bound to sediment. The units can be expressed as mg/kg, the same as sediment concentration data. A PCBs particle ratio greater than 0.5 mg/kg is used as a preliminary threshold for classifying water samples as elevated. In addition, PCBs stormwater concentrations that are in the top 15 percent of all concentrations measured in stormwater in the Bay Area to date may also be considered elevated.

During WY 2021, the Program collected eight individual and composite MS4 sediment samples. Samples were collected from surface sediments in driveways and gutters or sediment in storm drain inlets, and other stormwater conveyance structures in public rights-of-way. One MS4 sediment sample was collected from a catchment of interest for screening purposes, and seven MS4 sediment samples were collected from priority catchments as part of ongoing source investigations. Within these WMAs, samples were collected on or near parcels of interest that had characteristics associated with potential PCBs use or release. Total mercury concentrations ranged from 0.051 to 0.34 mg/kg, with both a median and mean of 0.17 mg/kg. Two of these samples had elevated mercury concentrations above 0.3 mg/kg. Concentrations of Total PCBs (sum of RMP 40 congeners) ranged from 0.012 to 0.68 mg/kg, with a median of 0.12 mg/kg and a mean of 0.19 mg/kg. Four of these samples had elevated PCBs concentrations above 0.2 mg/kg. The screening sample collected in the City of Sunnyvale did not have elevated PCBs (< 0.2 mg/kg), but did have a slightly elevated concentration of mercury (0.31 mg/kg).

The program reviewed these data along with sampling data and other information collected during previous years as part of targeted source investigations that were ongoing in WY 2021 in twelve WMAs within the Basin. Based on this review, the Program confirmed ten PCBs source properties and identified three potential source properties that require further investigation. The confirmed and potential source properties were identified in six of the twelve WMAs that were under investigation during WY 2021. Two of the WMAs require further investigation in WY 2022 in order to identify sources. The Program was unable to identify any specific source properties

in four of the remaining WMAs that were under investigation in WY 2021. Figure E.3 presents the WMA prioritization status for all catchments of interest based on all results of screening monitoring and source investigations conducted in the Santa Clara Valley through WY 2021.

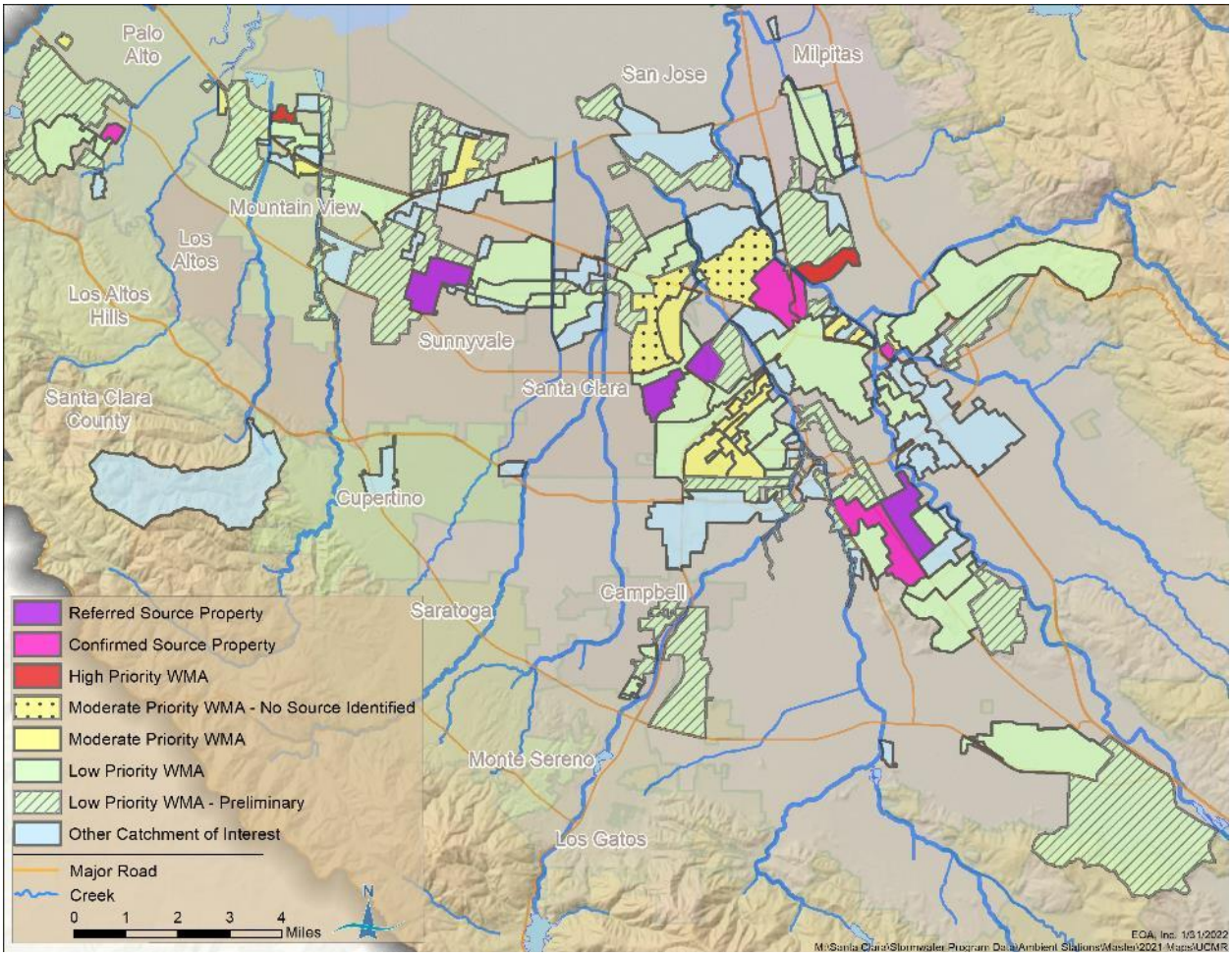

Figure E.3. Watershed Management Area (WMA) prioritization in the Santa Clara Basin.

C.2 Copper

In compliance with provision C.8.f, SCVURPPP analyzed two water samples for total and dissolved copper. Samples were collected from two locations on Los Gatos Creek on July 1, 2021. Copper concentrations were within ranges measured at similar types of sites (i.e., watersheds with mixed land uses) sampled in prior years, and were well below the hardness-dependent dissolved copper WQOs for acute and chronic impacts.

C.3 Nutrients

Nutrients were included in the MRP POC monitoring requirements to support Regional Water Board efforts to develop nutrient numeric endpoints (NNE) for the San Francisco Bay Estuary. This effort has now been captured and superseded by the State Water Board Biostimulatory Substances and Biological Integrity Project, which is proposing to adopt a statewide WQO for biostimulatory substances (such as nitrogen and phosphorus) along with a program of

implementation as an amendment to the Water Quality Control Plan for Inland Surface Water, Enclosed Bays and Estuaries of California (ISWEBE Plan).

In WY 2021, the Program analyzed two samples for nutrient parameters to satisfy provision C.8.f monitoring requirements. The samples were collected from two locations on Los Gatos Creek concurrent with the copper POC samples. Results of the nutrient monitoring were similar to nutrient samples collected at the same stations in May 2021 as part of the bioassessment survey protocol.

C.4 Recommendations for WY 2022 POC Monitoring

In WY 2022, the Program will continue to collect and analyze POC samples in compliance with provision C.8.f. PCBs and mercury monitoring will continue with the goal of identifying WMAs and specific source properties where new PCBs and mercury control measures can be implemented during the next permit term.

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