Chapter 3
Water Quality Issues and Priorities in the Watershed

3.1 Activities Contributing to Stormwater Pollution

Receiving water quality in the Santa Clara Basin Watershed is threatened by urbanization, stormwater runoff, and legacy pollutants. Results of creek status monitoring conducted by SCVURPPP[5] in compliance with Provision C.8 of the MRP from 2012 through 2018 suggest that urban streams in the Santa Clara Basin are generally in poor ecological condition with impacted populations of aquatic life resulting from long-term changes in stream hydrology, channel geomorphology, in-stream habitat complexity, and other modifications to the watershed and riparian areas associated with the urban development that has occurred over the past 70 years (SCVURPPP, 2018b). Stream channels have been altered for agricultural and flood control purposes, riparian forests have been converted to urban land uses, and the network of storm drainage systems constructed over the years limits opportunities for stormwater percolation and increases peak rates of storm flow.

Additionally, stormwater runoff may convey trash, sediments, nutrients, pesticides, bacteria, and metals directly to receiving waters and impact surface water quality. Polychlorinated Biphenyls (PCBs) and mercury are legacy pollutants of concern that pose a public health risk to those eating certain types of fish in the San Francisco Bay. Urban runoff is considered a source of these pollutants, as it transports them from upstream land use areas to the Bay. PCBs, used historically in transformer oils, sealants, building materials and industrial and electrical applications, have been detected in low concentrations throughout the watershed, with higher concentrations in old industrial and old urban areas. Historic mining operations in the Guadalupe River watershed and air deposition and other sources throughout the County have contributed mercury to stormwater in concentrations known to adversely affect sensitive aquatic organisms. Water quality control plans are now in place to reduce impacts of PCBs and mercury on San Francisco Bay.

Emerging contaminants and issues such as nutrients, water temperature, and the effects of climate change may also have an impact on receiving waters but are not yet regulated. Water temperature in waterways is a particular concern for aquatic ecosystems. Future updates of the SWRP will provide more information on the effects of and control measures for these pollutants, as that information becomes available.

3.2 Applicable Regulatory Permits

Discharges of stormwater and dry weather runoff from municipal separate storm sewer systems (MS4s) in the watershed are covered under the MRP and associated waste discharge

[5] Refer to the List of Abbreviations on page v for all abbreviations.

requirements. Other stormwater related general (statewide) NPDES permits apply to certain activities in areas within the watershed boundary, including the Construction, Industrial, and Drinking Water System General NPDES Permits. There are also three regional wastewater treatment facilities within the watershed that discharge to South San Francisco Bay, consistent with wastewater NPDES permits.

3.3 Applicable Total Maximum Daily Load (TMDL), Trash, and Copper Requirements

The MRP contains requirements for implementing urban runoff controls consistent with four TMDLs[6] that apply to the watershed boundaries: the San Francisco Bay and Guadalupe River Watershed Mercury TMDLs; the San Francisco Bay PCBs TMDL; and the TMDL for Diazinon and Pesticide-Related Toxicity for Urban Creeks[7]. The MRP also contains provisions for trash load reduction and copper site-specific objectives. Specific requirements for the TMDL pollutants, trash and copper are discussed below.

Mercury

The San Francisco Bay mercury TMDL requires a regionwide mercury load reduction of 82 kg/yr in urban stormwater by 2028. As an interim reduction target towards the overall TMDL goal, the MRP requires that all MRP permittees collectively reduce mercury by 0.048 kg/yr by June 30, 2020 through the implementation of green stormwater infrastructure (GSI). The MRP load reduction is divided among the MRP counties based on population, which equals a required mercury load reduction of 0.016 kg/yr via GSI by SCVURPPP permittees by June 30, 2020. Additional mercury reductions may be prescribed in future permits.

PCBs

The San Francisco Bay PCBs TMDL requires a regionwide PCBs load reduction of 14.4 kg/yr in urban stormwater by March 2030. This load reduction is divided among the MRP counties based on population. Via the MRP, SCVURPPP permittees are required to reduce PCBs in stormwater by 0.16 kg/yr by June 30, 2018, and 0.94 kg/yr by June 30, 2020 through a combination of source control, treatment control measure and pollution prevention strategies. The portion of the PCBs load reduction required by the MRP to be met by green stormwater infrastructure is 0.037 kg/yr by June 30, 2020 for SCVURPPP permittees.

Pesticides

The TMDL for Diazinon and Pesticide-Related Toxicity for Urban Creeks includes urban runoff allocations for Diazinon of 100 ng/l and for pesticide related toxicity of 1.0 Acute Toxicity Units and 1.0 Chronic Toxicity Units. To address the urban runoff contribution to urban creek toxicity, permittees are required to implement a pesticide toxicity control program. This program is

[6] A Total Maximum Daily Load (TMDL) is a regulatory term used to describe a plan for restoring impaired waters that identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

[7] Information on these TMDLs is available at: https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/index.html

required to address an agency's own and others' pesticide use, to reduce pesticide impacts on water quality.

Trash
Trash load reduction requirements are outlined in the MRP. SCVURPPP permittees are implementing programs to meet the requirements of 70 percent reduction by July 1, 2017 and 80 percent reduction by July 1, 2019. A future goal of 100 percent trash load reduction or no adverse impact to receiving waters from trash by July 1, 2022 is also described in the MRP.

Copper
MRP permittees are required to implement control programs for copper as identified in the Basin Plan. Control programs include prohibiting discharge of wastewater containing copper to the storm drain. Sources of this wastewater include water used to install, clean, treat or wash copper architectural features, water from pools, spas, and fountains, and wastewater from industrial facilities.

3.4 Ongoing Efforts to Address Water Quality Issues

Permittees have expended significant amounts of time, effort and resources addressing pollutant reduction and monitoring requirements in the MRP. These efforts vary by county and permittee. Countywide organizations such as SCVURPPP and regional organizations such as the Bay Area Stormwater Management Agencies Association (BASMAA) help coordinate efforts within the permit area. Permittees also contribute to regional programs such as the San Francisco Bay Regional Monitoring Program, which collects data on the water quality in the Bay in order to guide management decisions related to appropriate actions for improving water quality in the region.

3.4.1 SCVURPPP and Participating Agency Efforts

As described in Section 1.1, SCVURPPP is an association of thirteen cities and towns in Santa Clara Valley, the County of Santa Clara, and the Santa Clara Valley Water District that discharge stormwater to South San Francisco Bay and are covered under the MRP. SCVURPPP and its member agencies implement pollution prevention, source control, monitoring, and outreach programs aimed at reducing pollutants in stormwater runoff. Member agencies conduct individual compliance efforts, and jointly fund countywide efforts by SCVURPPP per the cost-sharing formula in a Memorandum of Agreement.

SCVURPPP has assisted member agencies with the implementation of NPDES permit requirements and efforts to improve water quality since its inception in 1990. In general, these efforts include:

- Conducting technical studies to determine appropriate management actions;
- Developing strategies and guidance for addressing certain pollutants and permit requirements;

- Conducting training for municipal staff on best management practices to protect water quality;
- Conducting water quality monitoring, sediment sampling, and bioassessments at locations countywide; and
- Preparing reports to demonstrate permit compliance, describe stream conditions and trends, and determine management actions.

Efforts by SCVURPPP and its member agencies to address specific pollutants are described below.

Mercury/PCBs
As described in Section 3.3, SCVURPPP member agencies are required to reduce the amount of PCBs and mercury entering the Bay via urban stormwater. Key pollutant control measures that local public agencies are implementing include:

- Identification and abatement of PCBs and mercury source properties;
- Planning and construction of GSI projects for capturing and treating stormwater; and
- Management of PCB-containing materials and wastes during building demolition.

During 2010-2016, SCVURPPP pilot-tested stormwater control measures for PCBs and mercury as part of the regional Clean Watersheds for a Clean Bay (CW4CB) project, funded by the U.S. Environmental Protection Agency. CW4CB developed tools to help guide control measure selection and implementation in various urban conditions. The project was completed in 2017[8].

Pesticides
All SCVURPPP agencies implement established integrated pest management (IPM) programs, use trained applicators, and conduct public outreach to address residential pesticide use. SCVURPPP also conducts several countywide outreach programs, including: 1) the "Our Water Our World" point of purchase campaign at hardware stores and nurseries to direct customers to less toxic pest control products; 2) less-toxic pest control trainings for hardware store and nursery employees; and 3) the Santa Clara Valley Green Gardener training program geared for residential landscape gardeners.

Trash
SCVURPPP agencies have taken steps to meet trash load reduction requirements including installing trash full capture devices, enhancing street sweeping and on-land cleanup events, source controls (such as product bans), and conducting beach and creek cleanups. To support municipal agencies in these efforts, SCVURPPP has conducted on-land trash assessments, studied the effectiveness of trash control strategies including street sweeping and screens on storm drain inlets, and continued a webinar series on trash reduction strategies via the Zero

[8] More information about the CW4CB project and the final project report are available at: http://basmaa.org/Clean-Watersheds-for-a-Clean-Bay-Project

Litter Initiative. These efforts have assisted municipal agencies in achieving reduction goals using multiple control approaches and assessment techniques.

To assess trash levels in local streams and shorelines, SCVURPPP participated in a regional project with BASMAA to develop a trash receiving water monitoring plan for San Francisco Bay Area. Monitoring began in October 2017 and will continue through 2020. SCVURPPP is conducting visual assessments at 30 stream sites in Santa Clara County during wet and dry seasons, and has trained municipal agency staff to assess another 32 sites during 2018 and 2019.

Copper

In accordance with the MRP, SCVURPPP and/or its member agencies implement programs regarding the following copper control measures:

- Manage waste generated from cleaning and treating copper architectural features, including copper roofs during construction and post-construction;
- Manage discharges from pools, spas and fountains that contain copper-based chemicals;
- Participate in the Brake Pad Partnership process to reduce the copper content of vehicle brake pads;
- Educate industrial inspectors on industrial facilities likely to use copper and ensure that proper BMPs are in place to minimize discharges of copper; and
- Conduct technical studies to investigate possible copper sediment toxicity and technical studies to investigate sublethal effects of salmonids.

3.4.2 Requirements for New Development and Redevelopment Projects

Since 2003, the MRP has required public and private development projects above a certain size threshold to include appropriate site design, pollutant source control, treatment measures, and where appropriate, hydromodification management measures, to protect water quality and control erosive runoff flows. Beginning December 1, 2011, public and private projects that create and/or replace 10,000 square feet or more of impervious surface (5,000 sq. ft. for highly polluting land uses) are required to provide stormwater treatment by using Low Impact Development (LID) methods: rainwater harvesting and use, infiltration, evapotranspiration, or biotreatment. LID techniques reduce water quality impacts by preserving and recreating natural landscape features, minimizing imperviousness, maximizing opportunities for infiltration and evapotranspiration, and using stormwater as a resource. Vault-based treatment such as media filters are not allowed as stand-alone treatment measures, except in specific transit-oriented, high-density projects.

As part of their development review process, SCVURPPP municipal agencies review project applications and ensure that all regulated development projects are implementing these requirements. SCVURPPP agencies also conduct inspections of constructed LID stormwater treatment measures to ensure that they are being properly maintained by property owners.

The SCVURPPP C.3 Stormwater Handbook (C.3 Handbook)[9] is used to provide guidance to developers, builders, and project applicants on these requirements. The C.3 Handbook is a comprehensive document that provides information on the development review process, selecting source control and site design measures, sizing LID treatment and hydromodification measures, and operational and maintenance requirements.

3.4.3 Green Stormwater Infrastructure Planning

The MRP requires that each municipal agency complete a GSI Plan. Municipal agencies were required to adopt a GSI Plan Framework by June 30, 2017 and must complete their plans by September 30, 2019. SCVURPPP assisted its member agencies with GSI Plan development.

GSI Plans are the guiding documents for how agencies will include "low impact development drainage design into storm drain infrastructure on public and private lands, including streets, roads, storm drains, parking lots, building roofs, and other storm drain infrastructure elements." These plans identify how agencies intend to implement GSI measures to develop a more sustainable stormwater management system.

SCVURPPP municipal agency GSI Plans included the mechanism developed in this SWRP to prioritize GSI projects. The quantitative methods for identification and prioritization of stormwater capture projects are described in Chapters 5 and 6 of this SWRP.

The MRP requires that the GSI Plans include a tracking mechanism for GSI projects constructed within the agency's jurisdiction. The tracking mechanism is described in Section 7.3.5 of this SWRP and was incorporated into the GSI Plans to meet this requirement. The same tracking mechanism will be used to track implementation of SWRP projects that are not part of GSI Plans.

SCVURPPP developed a GSI Handbook[10] to assist in the planning and design of GSI projects. The GSI Handbook was incorporated into or referenced in agency GSI Plans. The GSI Handbook provides general guidelines for designing streetscapes or other projects on public parcels that incorporate stormwater treatment measures, as well as typical details and specifications for a range of GSI measures.

3.4.4 Santa Clara Valley Water District Efforts

One Water Plan

As described in Chapter 1, the One Water Plan is currently under development. The One Water Plan aims to identify, prioritize and implement activities at a watershed scale to meet flood protection, water supply, water quality and environmental stewardship goals and objectives.

[9] The C.3 Handbook is available at: http://www.scvurppp-w2k.com/c3_handbook.shtml

[10] The GSI Handbook is available at: http://scvurppp.org/scvurppp_2018/swrp/resource-library/

Because viewing stormwater as a resource enables it to be utilized for multiple benefits, it is an important consideration under a "one water" approach.

Safe, Clean Water and Natural Flood Protection Program
In November 2012, the voters of Santa Clara County overwhelmingly approved Measure B, the Safe, Clean Water and Natural Flood Protection Program, as a countywide special parcel tax for 15 years with a sunset date of June 30, 2028. This program replaced the Clean, Safe Creeks and Natural Flood Protection Plan, which voters approved in November 2000. The Safe, Clean Water Program was developed with input from more than 16,000 residents and stakeholders and was created to match the community's needs and values. The voters of Santa Clara County approved five priorities for this program:

- Priority A: Ensure a Safe, Reliable Water Supply
- Priority B: Reduce Toxins, Hazards and Contaminants in our Waterways
- Priority C: Protect our Water Supply from Earthquakes and Natural Disasters
- Priority D: Restore Wildlife Habitat and Provide Open Space
- Priority E: Provide Flood Protection to Homes, Businesses, Schools and Highways

While stormwater management is most directly tied to Priority B with its focus on water quality and pollution prevention, it is also supported by Priority A as it may be a source of water supply, Priority D as it may provide additional water for wildlife and aquatic systems, and Priority E as managing stormwater may reduce flood risk.

3.5 SWRP Strategies to Address Water Quality Requirements

As described in Section 3.3, the MRP includes provisions for urban stormwater load reductions identified in the TMDLs for mercury and PCBs and additional requirements for trash reductions and copper and pesticide controls. The SWRP assists in identifying potential project opportunities that can help achieve these urban runoff load reductions.

The SWRP addresses pollutant runoff and/or pollutant sources through a quantitative process to identify, analyze, and prioritize project opportunities. The prioritization process included analysis of metrics for water quality benefits, water supply, flood management, environmental and community benefits. These methods and metrics were used along with screening and input from SCVURPPP and its member agencies in the prioritization of stormwater and dry weather runoff capture and treatment project opportunities.

The SWRP also supports development of the GSI Plans that are required by the MRP for each SCVURPPP municipal agency, as described in Section 3.4.2. The SWRP includes methods of identification, prioritization, and tracking of projects required for the GSI Plans.

GSI projects that are ultimately implemented as a result of the SWRP process will have multiple benefits including reduction of pollutant loads required by the TMDLs, reduction of trash, and

associated improvements in water quality. The SWRP incorporates MRP goals and requirements into the project prioritization process, thereby assisting in MRP and TMDL compliance. The SWRP further supports the MRP requirements regarding implementation of GSI by providing concepts for high priority GSI project opportunities that will facilitate future applications for grant funding.

In addition, the SWRP provides a list of prioritized potential GSI projects that can:

- Build climate change resiliency by managing flood risk through runoff reduction and carbon sequestration;
- Build resiliency to drought via groundwater recharge and augmentation of water supplies;
- Reduce urban heat island effects;
- Lower building energy demands;
- Improve coastal resiliency, and
- Reduce energy needed to manage water.