Santa Clara Valley
*Urban Runoff*
Pollution Prevention Program

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

*Hand Delivered to SF Bay Water Board (c/o: Richard Looker) on 3/28/16*

March 28, 2016

Mr. Bruce H. Wolfe
Executive Officer
San Francisco Bay Region
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

**Subject: SCVURPPP Report on Progress Toward Developing a List of Watershed Management Areas for PCB and Mercury (MRP 2.0 Provision C.11/12.a.iii)**

Dear Mr. Wolfe:

On behalf of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and its Permittees, I am pleased to submit the attached *Progress Report – Identifying Watershed Management Areas for PCB and Mercury*. The report is submitted in compliance with provisions C.11.a.iii and C.12.a.iii of the 2015 Municipal Regional Stormwater Permit ("MRP 2.0", NPDES # CAS612008, Order R2-2015-0049) which became effective on January 1, 2016.

The information contained in the progress report is consistent with the presentation recently made to your staff. Monitoring data cited in the report and collected prior to Water Year 2015 (October 2014-September 2015) have been previously submitted to the San Francisco Bay Regional Water Quality Control Board consistent with former NPDES permit requirements. Water Year 2015 monitoring data have been submitted consistent with MRP 2.0 requirements.

We look forward to further discussing our progress and next steps included in the report. Please contact me or Chris Sommers if you have any comments or questions. We look forward to continuing to work with you and your staff to successfully address new challenges regarding control measures for PCBs and mercury.

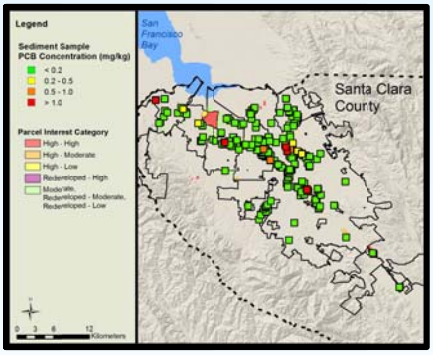
Very truly yours,

Adam W. Olivieri, Dr. P.H., P.E.
Program Manager

CC: SCVURPPP Management Committee Members
Tom Mumley, Assistant Executive Officer, SF Bay Water Board
Chris Sommers, SCVURPPP Project Manager

Santa Clara Valley
*Urban Runoff*
Pollution Prevention Program

# Watershed Monitoring and Assessment Program




## Progress Report: *Identifying Watershed Management Areas for PCBs and Mercury*

*Submitted in Compliance with NPDES Permit No. CAS612008 - Provision C.11.a.iii / C.12.a.iii*

March 28, 2016

*Page intentionally left blank*

# TABLE OF CONTENTS

# LIST OF TABLES



# LIST OF FIGURES



# LIST OF APPENDICES

# LIST OF ABBREVIATIONS

| | |
|---|---|
| ABAG | Association of Bay Area Governments |
| BASMAA | Bay Area Stormwater Management Agencies Association |
| BMPs | Best Management Practices |
| CW4CB | Clean Watersheds for a Clean Bay |
| CWA | Clean Water Act |
| FY | Fiscal Year |
| GI | Green Infrastructure |
| MPC | Monitoring and Pollutants of Concern |
| MRP | Municipal Regional Permit |
| MS4 | Municipal Separate Storm Sewer System |
| NPDES | National Pollution Discharge Elimination System |
| PCBs | Polychlorinated Biphenyls |
| POC | Pollutant of Concern |
| POTW | Publicly Owned Treatment Works |
| RAA | Reasonable Assurance Analysis |
| RMP | Regional Monitoring Program |
| SCVURPPP | Santa Clara Valley Urban Runoff Pollution Prevention Program |
| TMDL | Total Maximum Daily Load |
| WY | Water Year |
| WMA | Watershed Management Area |

# 1.0 INTRODUCTION

Fish tissue monitoring in San Francisco Bay has revealed bioaccumulation of Polychlorinated Biphenyls (PCBs), mercury, and other pollutants. The levels found are thought to pose a health risk to people consuming fish caught in the Bay. As a result of these findings, an interim advisory has been issued on the consumption of fish from the Bay. The advisory led to the Bay being designated as an impaired water body on the Clean Water Act (CWA) "Section 303(d) list" due to elevated levels of PCBs, mercury, and other pollutants. In response, the Regional Water Board has developed Total Maximum Daily Load (TMDL) water quality restoration programs targeting PCBs and mercury in the Bay. The general goals of the TMDLs are to identify sources of PCBs and mercury to the Bay, implement actions to control the sources, and restore water quality.

The PCBs and mercury TMDLs indicate that a 90% reduction in PCBs and 50% reduction in mercury found in discharges from urban stormwater runoff to the Bay are needed to achieve water quality standards and restore beneficial uses. Provisions C.11 and C.12 of the previous Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (MRP 1.0; Order R2-2009-0074) required Permittees to implement pilot-scale control measures during the permit term to reduce PCBs and mercury discharges from Municipal Separate Storm Sewer Systems (MS4s). These pilot studies were intended to enhance our collective knowledge about the costs and benefits of different Best Management Practices (BMPs) to control PCBs and mercury. The reissued Municipal Regional Permit (MRP 2.0, Order R2-2015-0049), requires municipal agencies to move from pilot-scale work to focused implementation and defined load reduction goals (e.g., 3 kg/year region wide for PCBs). The strategies and BMPs that will be applied to meet the load reduction goals are anticipated, at a minimum to include:

- Source property identification and referral for investigation and abatement;
- Green stormwater infrastructure/treatment controls; and
- Management of PCBs in building materials during demolition.

Provisions C.11.a.iii (1) and C.12.a.iii (1) of MRP 2.0 require Permittees to report on progress towards the development of a prioritized list of Watersheds Management Areas (WMAs) as a way to more easily track control measures and load reductions on a watershed and stormwater catchment scale. The WMA selection process is a logical next step in the efforts of SCVURPPP Permittees to identify sources of PCBs and mercury to the MS4s within the Santa Clara Basin. This progress report is intended to:

- Describe the WMA selection process being implemented by SCVURPPP Permittees, consistent with other Bay Area Stormwater Management Agencies Association (BASMAA) member agency processes;
- Summarize current information about the sources of PCBs and mercury in each WMA including recent and on-going pollutant characterization efforts; and,
- Provide an overview of next steps planned to verify WMAs of interest and identify existing and planned control measures that will address the requirements of MRP 2.0 provisions C.11 and C.12.

# 2.0 DEVELOPMENT OF WATERSHED MANAGEMENT AREAS

The selection and classification of WMAs is a multi-year process designed to identify land areas that disproportionately contribute PCBs and mercury to MS4s in the Santa Clara Basin, and therefore should be the focus of control measure implementation. The process being implemented by SCVURPPP Permittees is consistent with (and expands upon) the framework developed by BASMAA member agencies in consultation with San Francisco Bay Regional Water Quality Control Board (Regional Water Board) staff in preparation for MRP 2.0 PCB and mercury load reduction requirements. Consistent with MRP 2.0, the selection of WMAs is primarily focused on PCBs, with ancillary/secondary benefits to mercury.

## 2.1. Terminology

The WMA identification process assumes that all areas in the urban landscape that drain to the Bay fall within one of three PCBs *interest* area categories that can be further prioritized based on the *opportunity* for PCB load reductions. PCBs interest areas can be scaled from the parcel up to the stormwater catchment. The three area interest categories have the following characteristics:

- **High Interest** – Parcels, broader land areas, or stormwater catchments associated with old industrial land uses that have a relatively high likelihood of having elevated concentrations of PCBs (≥ 0.5 mg/kg) or mercury (>1.0 mg/kg) in street dirt, sediment from the MS4, or in stormwater runoff.
- **Moderate Interest** – Parcels, broader land areas, or stormwater catchments associated with land uses (e.g., older non-industrial urban land uses) that although they have limited risk factors associated with PCBs; have not been redeveloped; and do not contain stormwater treatment facilities. Moderate interest areas have a relatively moderate likelihood of having elevated concentrations of PCBs and/or mercury in street dirt, sediment in the MS4, or in stormwater runoff.
- **Low/No Interest** – Parcels, broader land areas, or stormwater catchments associated with newly urbanized areas; redeveloped areas that have stormwater treatment; open spaces; and parks where it is unlikely that PCBs were used, transported, or recycled. Low/No interest areas have a relatively low likelihood of having elevated concentrations of PCBs in street dirt, sediment in the MS4, or in stormwater runoff.

High interest areas where concentrations of PCBs in sediment are >0.5 mg/kg are further classified as *PCB Source Areas* and therefore become WMAs for PCBs. Because these areas are typically defined at the stormwater catchment scale, they will often require a source investigation to understand the extent and magnitude of the source of elevated PCBs. A *Source Property/Parcel* is a property (sometimes composed of multiple parcels) that has been identified through source investigations as an elevated source of PCBs to an MS4 or receiving water body.

As high interest areas, WMAs or source properties are identified, *Opportunity Analyses* will be conducted to evaluate the resources needed and the likelihood that actions taken by SCVURPPP Permittees will achieve predicted reductions. Opportunity analyses for source properties/areas is a likely future step that will be based on factors such as property ownership, cost of oversight, regulatory authority, logistical considerations, and likelihood of rapid benefit from implementation of control measures. Opportunity area types have the following characteristics:

- **High Opportunity** – Parcels, broader land areas, or stormwater catchments that provide a relatively high opportunity for cost-effective controls such as referrals to the Regional Water Board or other agencies for subsequent remediation.
- **Moderate Opportunity** - Parcels, broader land areas, or stormwater catchments that provide a relatively moderate opportunity for cost-effective controls. These include areas where additional PCB or mercury load reductions could be achieved as the urban landscape is redeveloped and/or retrofitted with Green Infrastructure (GI), providing the opportunity for integration of PCBs (and mercury) load reductions with other drivers and funding sources such as transportation projects.
- **Low Opportunity** - Parcels, broader land areas, or stormwater catchments that have low or urban background PCBs and mercury concentrations and/or provide low or no opportunity for cost-effective controls.

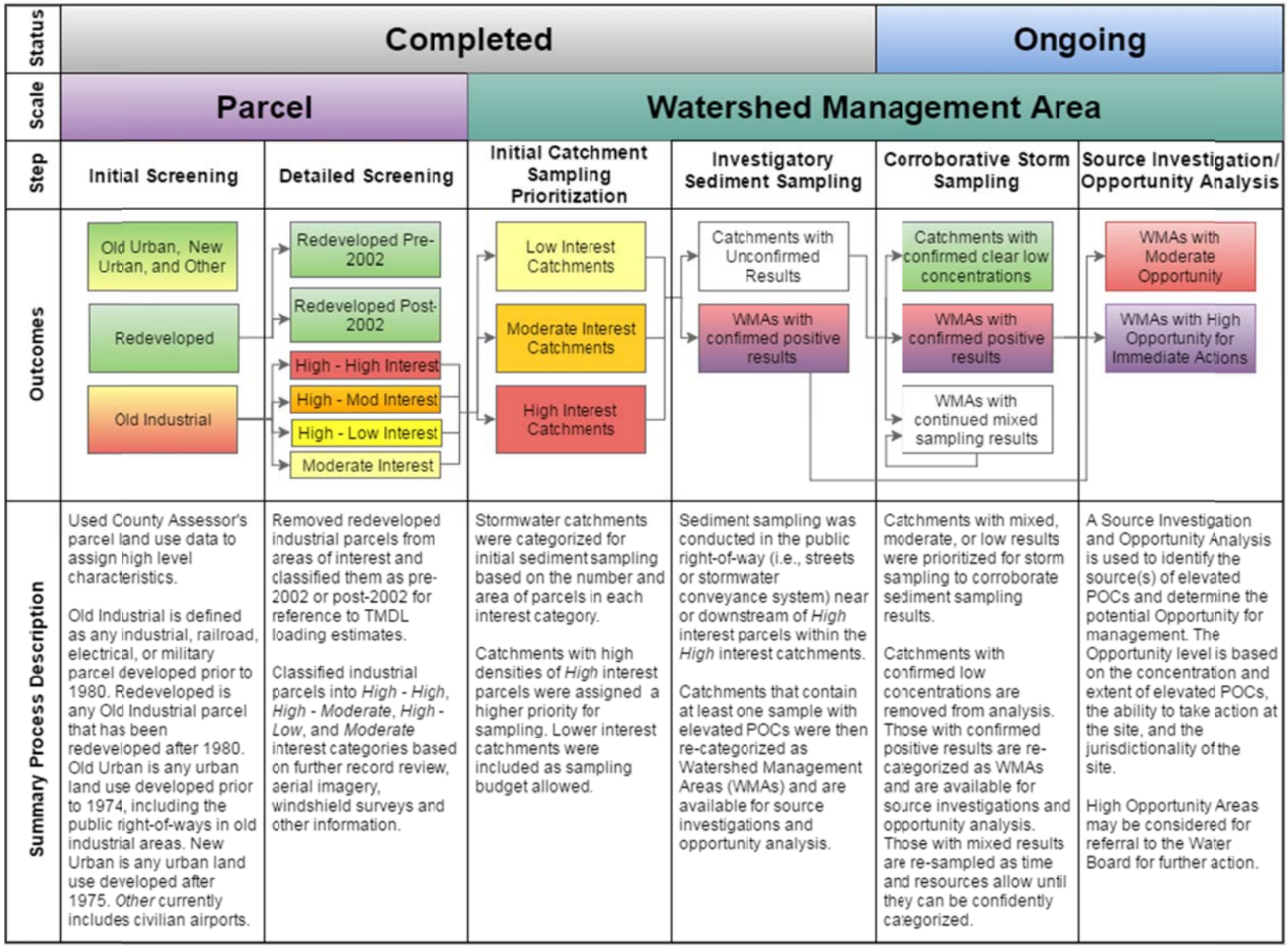
## 2.2. WMA Selection Process

In 2015, SCVURPPP staff worked with other BASMAA member agencies to develop a framework for identifying areas of interest and opportunity for PCB and mercury controls. This iterative framework was adapted by SCVURPPP to include the following four steps that occur first at the parcel-scale (steps #1&2) and then at the catchment-scale (steps #3&4):

1. **Initial Screening (Parcel Scale) -** Identify industrial parcels that were developed in or prior to 1980 (i.e., old industrial parcels), or have other land uses associated with PCBs or mercury. These parcels are referred to as *Potential High Interest* areas.
2. **Detailed Screening (Parcel Scale)** - Classify Potential High Interest areas into *High or Moderate Interest, or Redeveloped* areas based on the evaluation of existing information on current land uses and practices (e.g., extent and quality of pavement, level of current housekeeping, presence of heavy equipment, redevelopment status, stormwater treatment) using local knowledge combined with windshield/Google Street View/aerial photo surveys.
3. **Investigative and Corroborative Monitoring (Catchment Scale)** - Conduct sediment and/or stormwater monitoring in the public right-of-way (i.e., streets or stormwater conveyance system) in catchments that contain High Interest parcels and analyze samples for PCBs and mercury. Based on the results of monitoring at the catchment scale, identify catchments that have a high likelihood of containing significant sources of PCBs or mercury – *Watershed Management Areas (WMAs)*.
4. **Opportunity Analysis (Parcel or Catchment Scale)** - Based on a combination of the results of desktop/windshield evaluations and sediment/stormwater monitoring, prioritize WMAs and associated parcels for control measure implementation. Control measures will focus on portions of WMAs or parcels where opportunities for cost-effective load reduction actions by Permittees have been identified.

Table 1 includes an illustration of the WMA selection process and the portion completed to-date. More detailed descriptions of each step of the process, including monitoring data and other information obtained and analyzed to-date to identify and prioritize WMAs, are included in the following subsections.

Table 1. Summary flow chart for identifying Watershed Management Areas (WAMs) for PCBs and Mercury.



### 2.2.1. Summary of GIS Data Layers and Databases Developed/Utilized

The identification and prioritization of WMAs requires a great deal of both spatial and non-spatial data collection and management from multiple Permittees. SCVURPPP assisted in development of the data management system for Permittees to provide consistency in the process. SCVURPPP maintains a geodatabase that contains all relevant Geographical Information System (GIS) data associated with PCB and mercury source identification and control measure implementation in the Santa Clara Basin. Existing GIS data layers include, but are not limited to, the following:

- All parcels within Santa Clara County with associated information such as land use, address, and ownership;
- *High* interest parcels and associated attributes developed during the initial and detailed screening processes, including extent and quality of pavement, level of current housekeeping, presence of electrical or heavy equipment, redevelopment status, and stormwater treatment;
- Confirmed PCBs source areas and parcels;
- Watershed Management Areas (WMAs);
- Stormwater catchment and watershed boundaries;
- Storm drain network for each Permittee; and
- All known sediment and storm sampling data tested for PCBs or mercury.

The locations of a number of facility types potentially associated with either PCBs or mercury were identified and mapped as "points" in GIS data layers. These facility types include those associated with electrical generation, known mercury emitters, metal manufacturing, drum recycling, metal recycling, shipping, automotive recycling, general recycling, and those known to have or historically have had PCBs in use. This information was primarily gathered by the San Francisco Estuary Institute (SFEI) as part of the Urban Stormwater BMPs project (funded by a Proposition 13 grant) and contains data from a variety of sources including the California Air Resources Board, Envirostor, Superfund, Department of Toxic Substances Control, and the California State Water Resources Control Board. The list of facility types was previously described in the Program's Integrated Monitoring Report – Part C (SCVURPPP 2014).

### 2.2.2. Step #1 – Initial Screening (Parcel-Based)

As a first step, a screening process was developed to identify all parcels within the Santa Clara Basin that are of Potential High Interest for PCBs and mercury. These are parcels that are identified as old industrial (i.e., were industrialized pre-1980, the time when PCBs were still heavily used). Although PCBs may be anywhere in the older urban environment due to their widespread use in caulking, hydraulic fluids, and electrical equipment, prior sampling and historical knowledge indicate that industrial, electrical, railroad, and military land uses have a much higher risk of being contaminated with PCBs. Therefore, all parcels with these land uses were extracted from the 2005 land use layer developed by the Association of Bay Area Governments (ABAG). To improve this GIS data layer, the County of Santa Clara Assessor's land use data was screened to add additional parcels meeting the age of development and land use criteria. The Assessor's parcel data layer is particularly useful because of its accuracy and it contains the year that each parcel was last developed. This information is useful in screening for parcels that have been redeveloped after 1980. This process identified **5,483 Potential High Interest parcels** for PCBs and mercury within the Santa Clara Basin.

## 2.2.3. Step #2 – Detailed Screening (Parcel-Based)

A more detailed screening of Potential High Interest parcels was conducted in step #2 by classifying each parcel of the 5,483 parcels based on a number of risk factors for PCBs and mercury. These factors included the extent and quality of pavement, level of housekeeping, presence of heavy or electrical equipment, and redevelopment status of the parcel. These factors were documented for each parcel based on desktop evaluations conducted by SCVURPPP staff. The data on each parcel was verified by Permittees, and additional data was gathered from inspections, windshield surveys, and records, such as stormwater violations, the presence of stormwater treatment facilities on the property, and current and future redevelopment status.

A priority ranking system developed by SCVURPPP staff and based on the risk factors collected by Permittees and SCVURPPP was then used to further rank Potential High Interest parcels and identify those of High Interest. Parcels were only removed from the High Interest pool if they had zero risk factors associated with PCBs. These tended to include light industrial businesses such as shipping or offices and those significantly redeveloped into housing or office buildings. Of the nearly 5,500 parcels identified as Potential High Interest, a total of **2,639 High Interest parcels** were identified.[1] The High Interest parcels in the Santa Clara Basin are illustrated in Figure 1. The results of the parcel-based analysis (i.e., Steps #1 and #2 of the process) are included in Table 2.

Table 2. Total number of parcels within SCVURPPP Permittee boundaries and numbers of parcels identified as potential high interest and high interest for PCB and/or mercury sources.

| Permittee | Number of Parcels | | |
|---|---|---|---|
| | Total | Potential High Interest | High Interest |
| Campbell | 11,687 | 329 | 173 |
| Cupertino | 16,568 | 79 | 44 |
| Los Altos | 11,059 | 3 | 3 |
| Los Altos Hills | 3,211 | 0 | 0 |
| Los Gatos | 10,886 | 31 | 27 |
| Milpitas | 17,486 | 149 | 101 |
| Monte Sereno | 1,265 | 0 | 0 |
| Mountain View[2] | 19,099 | 398[2] | 89[2] |
| Palo Alto | 20,611 | 241 | 75 |
| San Jose | 238,957 | 2,533 | 1,216 |
| Santa Clara | 29,033 | 999 | 579 |
| Saratoga | 11,270 | 32 | 28 |
| Sunnyvale | 31,780 | 641[2] | 256[2] |
| Unincorporated County | 20,105 | 42[2] | 38[2] |
| **Total** | **443,017** | **5,473**[2] | **2,629**[2] |

[1] It is important to note that the detailed screening process did not differentiate between jurisdictional and non-jurisdictional parcels within the County. Moffett Field (operated by the US government) alone is over 1,500 acres of the High Interest parcels identified through this process.

[2] Parcels included in the table do not include the 10 parcels associated with Moffett Field and NASA Ames, which are not under the jurisdiction of Permittees. Other non-jurisdictional parcels (e.g., civilian airports and railroad right-of-ways) are included.

## 2.2.4. Step #3a – Investigatory Monitoring (Catchment-Based)

### SCVURPPP Water Year 2015 Pollutant of Concern Monitoring

As a next step in the identification of WMAs where PCB and mercury control opportunities would likely be the greatest, SCVURPPP implemented a targeted reconnaissance sediment sampling program on behalf of its Permittees in winter/spring 2015. The sampling was conducted in compliance with Provision C.8.e.i (POC Monitoring) required by MRP 1.0. A total of 202 sediment samples were collected and analyzed for PCBs and total mercury. The samples consisted of sediments that were collected from the MS4s in the Santa Clara Basin (e.g., in storm drain lines beneath manholes, storm drain inlets, pump stations) or from locations where they could potentially reach the MS4 (e.g., sediment in street gutters, driveways and other surface sediments).

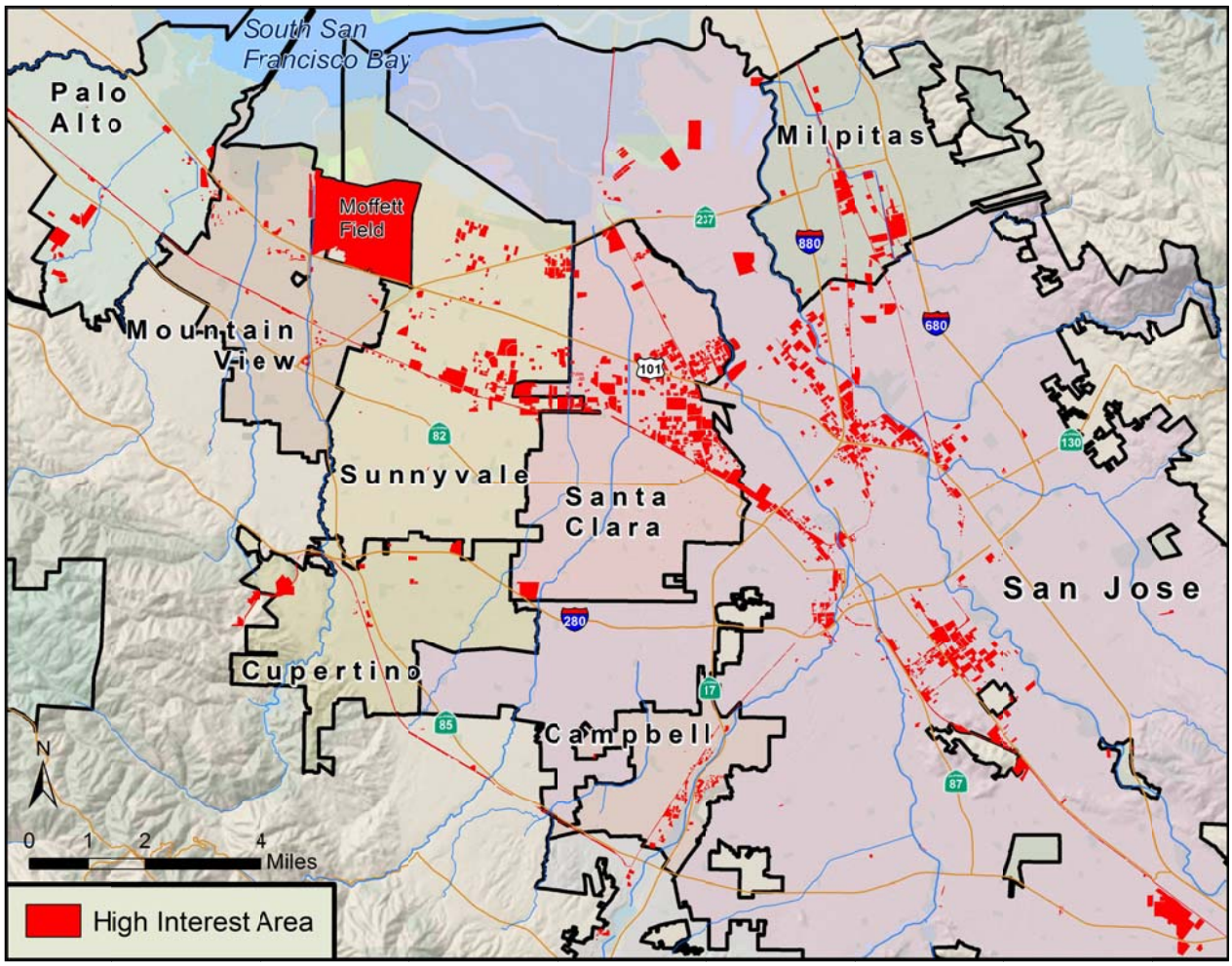



Figure 1. High Interest Parcels for PCBs and mercury in the Santa Clara Basin.

Since there were far more High Interest parcels (2,639) than resources available for monitoring, an attempt was made to collect composite sediment samples from stormwater catchments that contained the highest density of High Interest parcels. Of the over 800 urban catchments within the Santa Clara Basin that have outfalls with a diameter of 24 inches or larger (Mattern and WLA 2003), 139 were identified as catchments of interest for the purpose of the investigatory monitoring conducted in 2015 (Figure 2).[3] Many of the catchments shown in Figure 2 only contain a very small number of High Interest parcels, but there is a need to be more inclusive at this point in the process to reduce the possibility of a source area being inadvertently omitted. Old industrial areas reclassified as Moderate Interest in Step #2 or identified as being significantly redeveloped were not explicitly considered in the selection of these catchments, but the vast majority of these parcels are also included within the 139 catchment boundaries.

Concentrations of PCBs and mercury in sediment samples collected during WY 2015 are illustrated in Figures 3 and 4, respectively and are fully described in SCVURPPP's *Water Year 2015 POC Monitoring Report - PCBs and Mercury Source Area Identification* (SCVURPPP 2016). Despite sampling a good proportion of the catchments with the greatest density of highest interest parcels, only 5% of the samples had total PCBs concentrations exceeding the 0.5 mg/kg threshold, and 91.5% of samples had low or urban background concentrations (< 0.2 mg/kg).

The lack of elevated concentrations observed via sampling targeted at the areas of highest interest indicates that it may be difficult to identify additional sources of PCBs via sediment-based monitoring.

[3] Although additional catchments contain High Interest parcels, they generally only contain a small number of parcels of interest, most of which are either electrical substations or railroad right-of-ways.

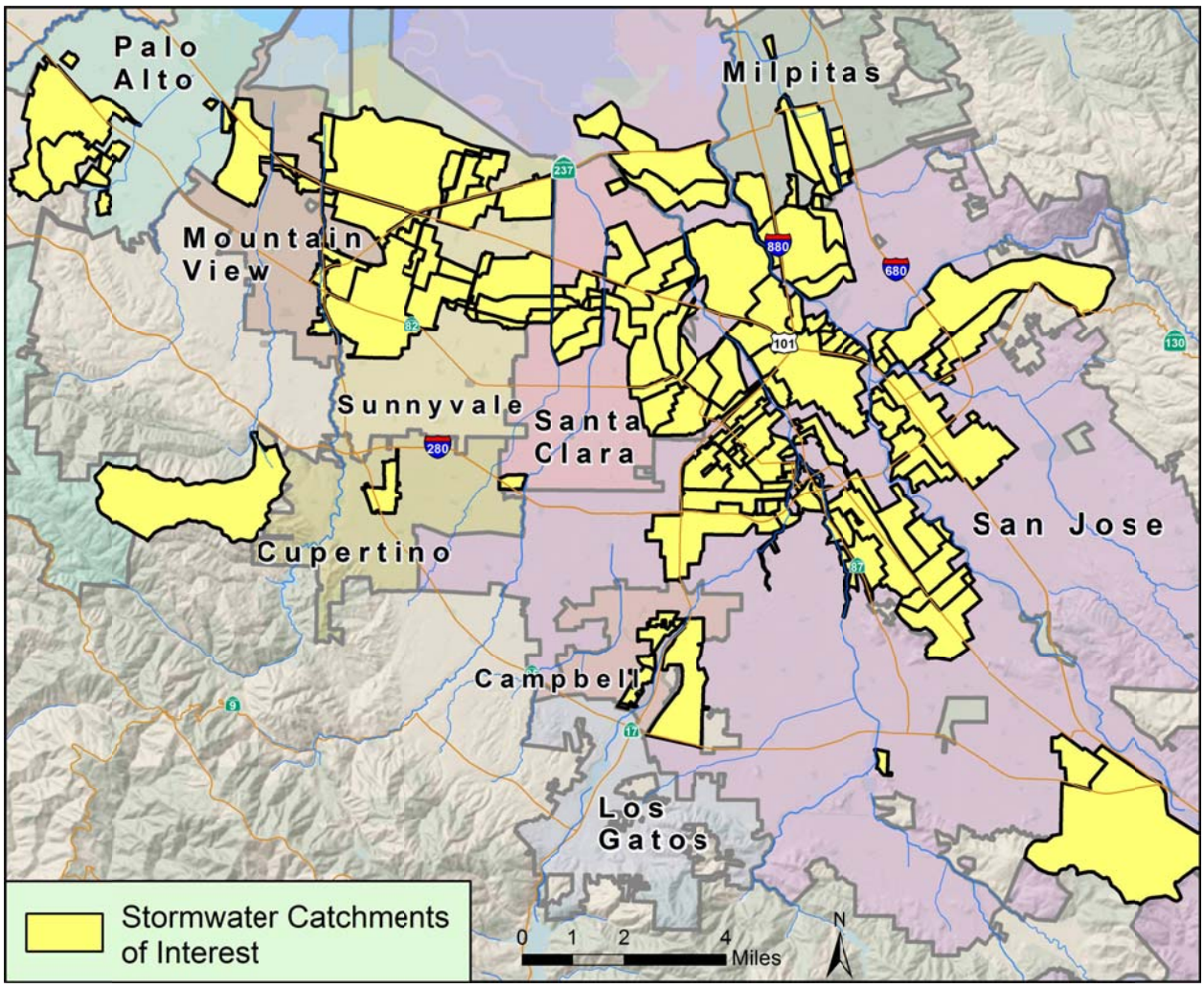



Figure 2. Stormwater Catchments of Interest for PCBs and Mercury in the Santa Clara Basin.

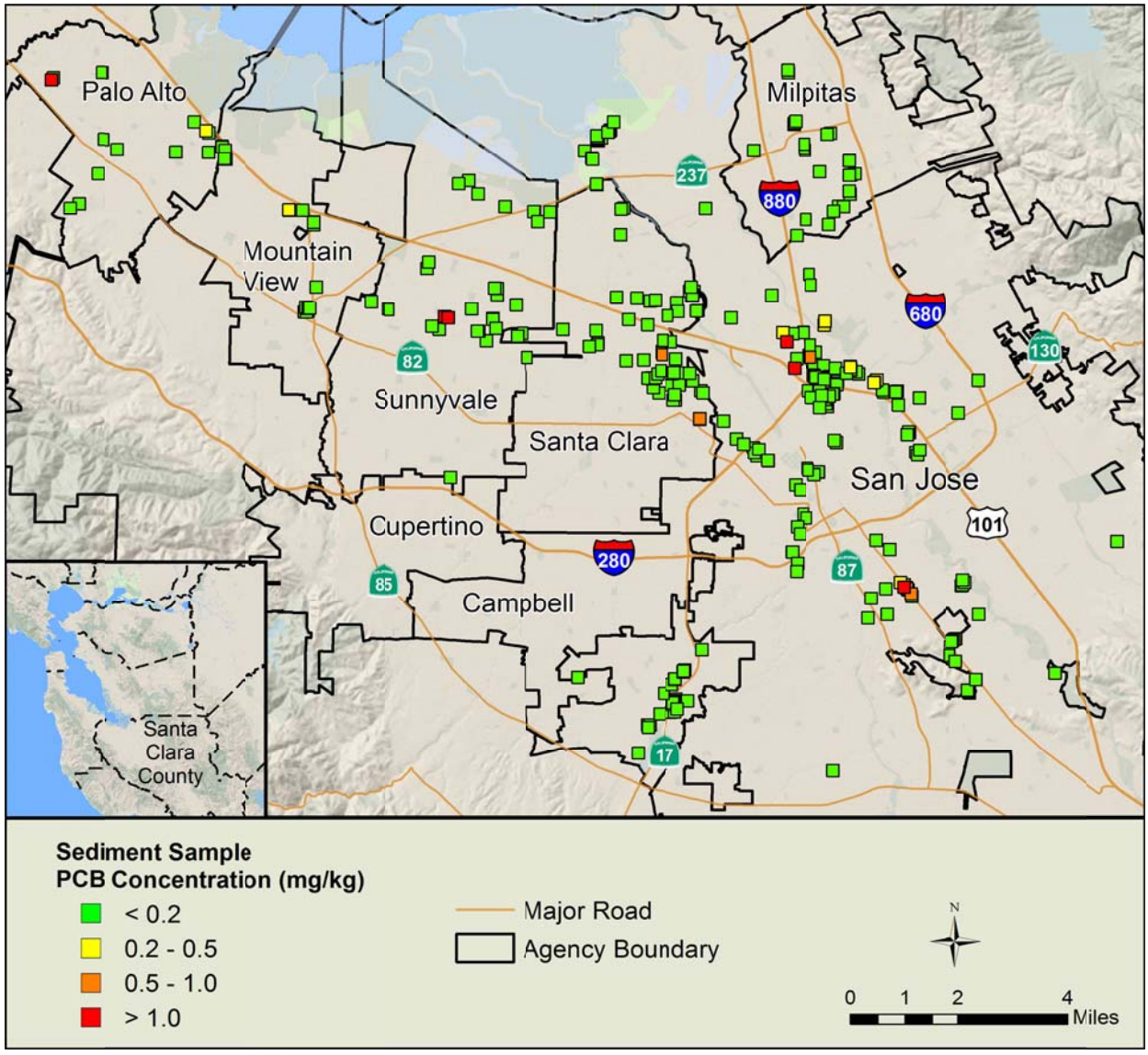



Figure 3. PCB concentrations in sediments collected from MS4s in the Santa Clara Basin in Water Year 2015.

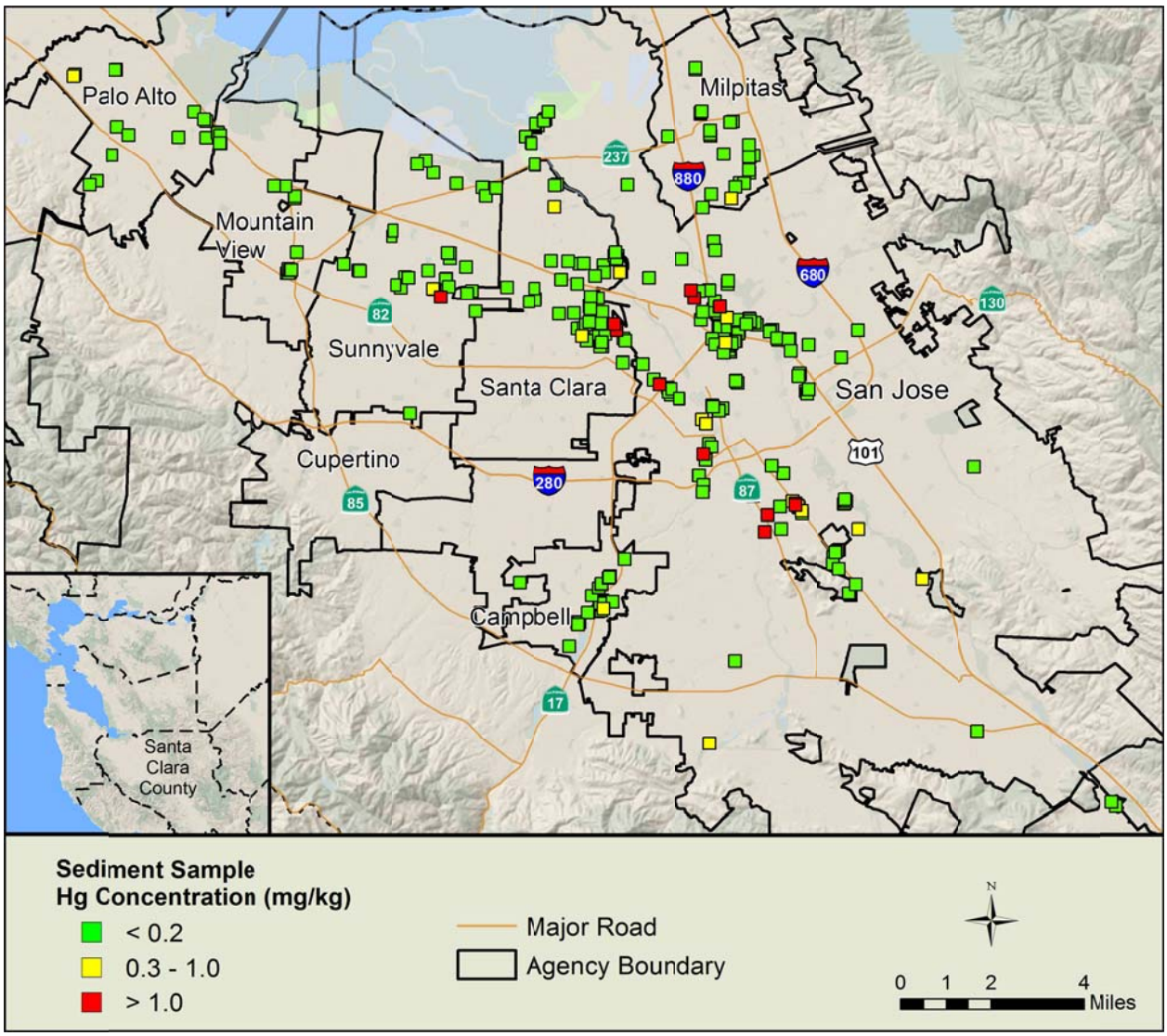



Figure 4. Mercury concentrations in sediments collected from MS4s in Santa Clara Basin in Water Year 2015.

## Additional (Historical) Sediment Monitoring

The monitoring approach implemented in WY 2015 by SCVURPPP builds upon previous efforts that included the collection of over 150 sediment samples within the MS4, the public right-of-way and private properties in the Santa Clara Basin (KLI and EOA 2002; City of San Jose and EOA 2003; Yee and McKee 2010, SCVURPPP 2015) as well as wet weather characterization monitoring of runoff from at least 5 larger watersheds within the County (McKee et al. 2012, McKee et al. 2013). Figure 5 illustrates the concentrations of PCBs observed during these studies.

Many of these samples were collected in the Leo Avenue catchment (San Jose), a known PCB source area that includes properties referred to the Regional Water Board for abatement/follow up. Additionally, the Northrop Grumman property in Sunnyvale and Sims Metal Management along Monterey Road were also previously identified as contributing elevated PCB concentrations to MS4s. Four additional samples, all collected in 2002, indicate four other areas with possibly elevated levels of PCBs (KLI and EOA 2002). Although many of these samples had PCBs concentration less than 1.0 mg/kg, they will be considered as data sources when identifying WMAs.

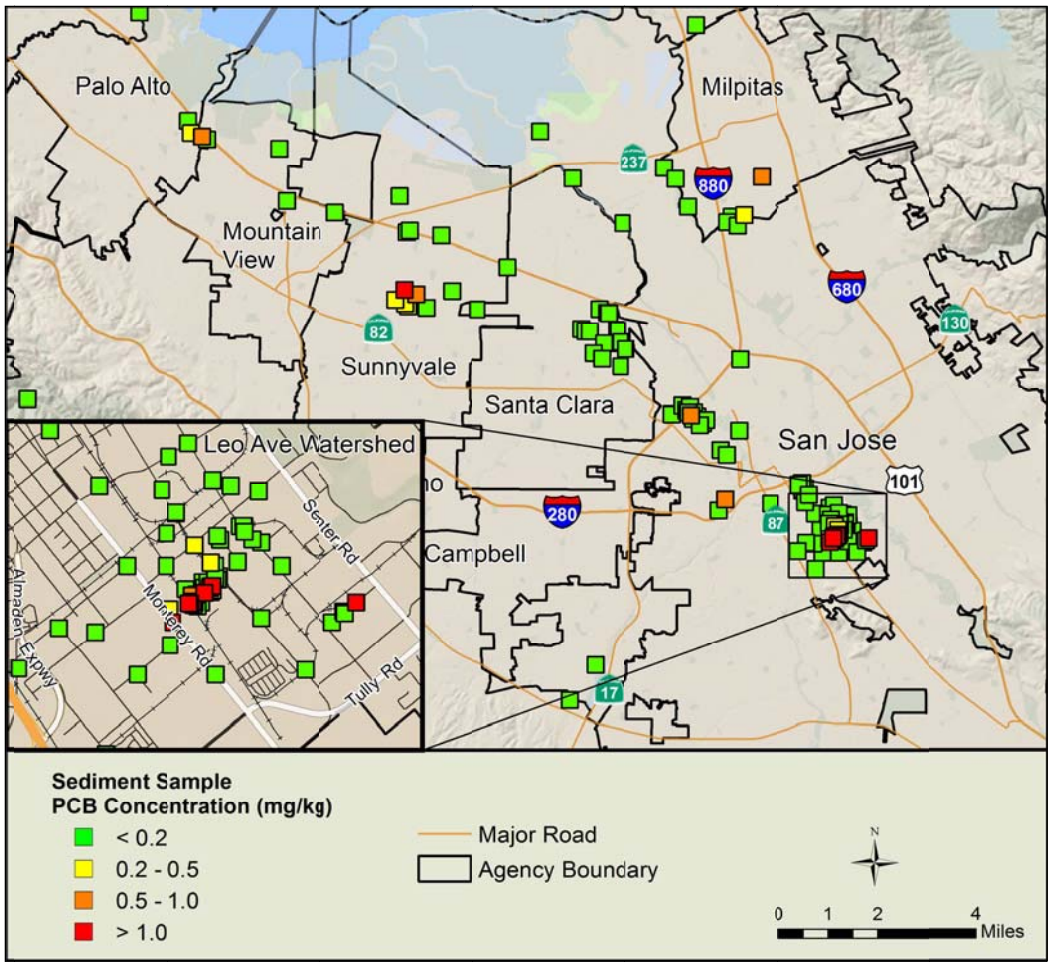



Figure 5. PCB concentrations in sediments collected from MS4s, public right-of-ways and private properties in the Santa Clara Basin prior to the WY 2015 monitoring (2000-2014).

## 2.2.5. Step #3b – Confirmatory Monitoring

Investigatory (sediment) monitoring described in Step #3a assisted in identifying a handful of catchments of interest for PCBs and mercury. Sediment monitoring was selected over storm-driven water sampling because it takes less time and resources to sample a site, which allows a significantly greater number of sites to be monitored for an equivalent level of resources. Additionally, storm-driven water monitoring is limited by the number of storms during a season and there is also a large variation in storm sizes and intensities, which transport PCBs and mercury at different times and levels.

Sediment as a matrix, however, has its limitations as well. There is often limited sediment in the MS4, which is designed to flush sediment through the system. For example, less than half of all inlets and manholes observed during WY 2015 sampling contained enough sediment to allow a sample to be collected. In addition, the sediment that is observed in the MS4 is often comprised of sand and gravel because the finer sediments are more easily mobilized in stormwater. Also, many industrial parcels have private storm drainage networks, so there is no overland flow of water and sediment from the property to the public right-of-way. As a result of these inherent challenges, sediment monitoring often produces false negative results, meaning that pollutants are not detected at high concentrations even if there is a source within the area targeted. Conversely, if a high concentration of a pollutant is observed via sediment monitoring, a source of the pollutant is likely within the vicinity of where the sample was collected and therefore no additional confirmatory monitoring would be needed to classify the area (catchment) as a WMA.

### PCB/Mercury Loads Monitoring – WYs 2002 through 2014

Recent stormwater monitoring conducted by the San Francisco Bay Estuary Regional Monitoring Program (RMP) and SCVURPPP at the watershed-scale focused on the collecting stormwater samples in catchments of interest to assist in calculating PCB and mercury loads. Data collected from these watersheds also assist in determining whether these areas contain significant sources of PCBs and/or mercury.

From WY 2002 to WY 2014 eight pollutant loading stations were monitored in Santa Clara Basin (Gilbreath et al. 2014).[4] Mean concentrations of PCBs in water at these eight loading stations ranged from 0.02 to 0.56 mg/kg, and median concentrations ranged from 0.01 to 0.11 mg/kg (Table 3). Of all the stations, the Sunnyvale East Channel watershed, which contains the Northrop Grumman property that is a Federal National Priorities List "Superfund" site and known to contain very elevated levels of PCBs (USEPA 2011), had the highest PCB concentrations observed.

The most samples have been collected to-date at the Guadalupe River station at Highway 101. This watershed also has the highest concentrations of PCBs in any natural water body measured within the Basin (Sunnyvale East is a man-made flood control channel), with mean and median concentrations several times higher than those measured at the other six loading stations in the Basin. The Guadalupe River watershed contains Sims Metal Management, a property associated with elevated levels of PCBs collected nearby in the public right-of-way. There also is strong evidence that other properties along Monterey Road across the street from Sims Metal Management have elevated levels of PCBs. However, the areas of these properties of interest is relatively small

[4] The RMPs Small Tributary Load Strategy (STLS) work group was formed in 2009 and loads monitoring was conducted and coordinated by a combination of RMP and BASMAA member agencies. Data collected prior to 2009 were coordinated through the RMP, but prior to the formation of the STLS.

compared to the watershed, indicating there are possibly additional sources of PCBs within the Guadalupe River watershed that are not accounted for.

Although the data collected to-date at the eight loading stations in the Basin has informed the WMA selection process, for the purposes of establishing WMAs, the watersheds draining to the loading stations are considered to be too large for identifying individual source areas and tracking the benefit from the management of PCBs and mercury overtime. Alternatively, many of these watersheds likely contain catchments of interest that will be identified as WMAs. That said, loads monitoring conducted at the scale of Sunnyvale East Channel and Lower Penitencia Creek (~3,000 acres) is still very valuable to understanding PCB concentrations within WMAs. Consistently low concentrations of PCBs in stormwater, such as measured in the five samples from Lower Penitencia Creek, are a very good indicator that there is not likely a High Opportunity for reducing PCBs within that watershed, despite the watershed being nearly 100% urbanized and containing some catchments of interest.

Table 3. Descriptive statistics of PCBs to suspended sediment ratios (mg/kg) in storm samples collected at watershed loading stations.

| Creek or Channel | Count | Min | 25th % | Median | Mean | 75% | Max |
|---|---|---|---|---|---|---|---|
| Calabazas Creek | 5 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.04 |
| Coyote Creek | 5 | 0.02 | 0.02 | 0.04 | 0.05 | 0.05 | 0.10 |
| Guadalupe River ( Highway 101) | 125 | 0.01 | 0.06 | 0.1 | 0.13 | 0.17 | 0.83 |
| Guadalupe River (Foxworthy Rd) | 17 | 0.01 | 0.01 | 0.02 | 0.04 | 0.04 | 0.21 |
| Lower Penitencia Creek | 5 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.03 |
| San Tomas Creek | 5 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 |
| Stevens Creek | 6 | 0.01 | 0.01 | 0.02 | 0.03 | 0.04 | 0.07 |
| Sunnyvale East Channel | 45 | 0.05 | 0.11 | 0.30 | 0.56 | 0.49 | 4.63 |

## Stormwater Characterization Monitoring – WY 2015

In collaboration with SCVURPPP, stormwater characterization monitoring began in WY 2015 via the RMP's Small Tributary Load Strategy (STLS). SCVURPPP identified seven locations draining high interest catchments for the RMP to monitor. The RMP also took an additional sample at the Lower Penitencia Creek loading station that had been sampled on four occasions (see Table 3). The sampling revealed an elevated PCB source that was previously unknown in a small catchment along Lower Silver Creek. Additionally, an elevated concentration of PCBs from a site that drains to a storm drain line along Ridder Park Drive, a catchment that concurrent sediment sampling also showed contained a source area (SCVURPPP 2016), was observed. Stormwater characterization monitoring results for WY 2015 are fully described in McKee et al. (2016).

# 3.0 WATERSHED MANAGEMENT AREAS IDENTIFIED TO-DATE

Stormwater catchments were chosen as the initial geographical scale at which Watershed Management Areas (WMAs) are identified. This scale is consistent with the intention of MRP 2.0 provision C.11/12.a.ii and will allow Permittees to more easily track control measure implementation. Catchment areas are based on the understanding of the stormwater and runoff patterns and hydrology in the Basin, which may also assist with the eventual development of the model used to conduct a Reasonable Assurance Analysis (RAA) for PCBs and mercury, which is also required by MRP 2.0.

Although stormwater catchments will form the basis for WMAs moving forward, adjustments may be made. As described in detail later, each Permittee must report in each Annual Report the list of WMAs within their jurisdiction, the control measures currently installed and planned to be installed within each WMA, along with a list of known PCB or mercury sources within each WMA. Therefore, WMAs will likely serve as the unit by which Permittees (or the Program) reports control measure implementation and load reduction benefits.

Table 4 provides a preliminary classification of stormwater catchments based on the likelihood that it contains a significant source(s) of PCBs or mercury. The classification is primarily based on whether sufficient evidence (e.g., PCBs in sediment over 0.5 mg/kg, or a stormwater PCB to sediment ratio over 0.5 mg/kg)[5] exists or if there is a high density of High Interest parcels within the catchment. Those catchments with sufficient evidence are considered *Confirmed WMAs* and will be evaluated and prioritized for further source identification tasks. A total of nine catchments have been identified as Confirmed WMAs at the time of this report (Table 5).

Table 4. Current (preliminary) classification of 139 stormwater catchments of interest for PCB and/or mercury. Confirmed Watershed Management Areas (WMAs) represent catchments with sufficient evidence that PCB or mercury source areas/parcels are present.

| Permittees within Catchments | Preliminary Classification | | Total |
|---|---|---|---|
| | Confirmed WMAs | Remaining Catchments of Interest | |
| Cupertino | - | 7 | **7** |
| Milpitas | - | 10 | **10** |
| Mountain View | - | 10 | **10** |
| Palo Alto | 1 | 7 | **8** |
| San Jose | 6 | 57 | **63** |
| San Jose & Unincorporated County | - | 2 | **2** |
| Santa Clara | 1 | 16 | **17** |
| Santa Clara & Unincorporated County | - | 1 | **1** |
| Sunnyvale | 1 | 18 | **19** |
| Sunnyvale & Santa Clara | - | 1 | **1** |
| Sunnyvale & Unincorporated County | - | 1 | **1** |
| **Total** | **9** | **130** | **139** |

[5] The thresholds for determining "elevated" or "moderately elevated" PCB concentrations in stormwater are yet to be determined.

Table 5. Characteristics of the Confirmed Watershed Management Areas (WMAs) for PCBs or Mercury in the Santa Clara Basin. Concentrations indicated in red are above monitoring thresholds established jointly be BASMAA member agencies.

| Confirmed WMA ID | Permittee | Water Body | Acres | % High Interest | Maximum Sediment Concentration (mg/kg) Observed | | Maximum PCB to Sediment Ratio (mg/kg) Observed in Stormwater |
|---|---|---|---|---|---|---|---|
| | | | | | Total Mercury | Total PCBs | |
| 001SFC100[6] | Palo Alto | San Francisquito Creek | 36 | 0% | 0.82 | **1.45** | **2.05** (n = 14) |
| 049SVE900 | Sunnyvale | Sunnyvale East Channel | 480 | 17% | 0.19 | **4.84** | **4.63** (n = 45) |
| 050GAC400 | Santa Clara | Guadalupe River | 717 | 26% | **3.26** | **0.80** | **0.83** (n = 125) |
| 051CTC275 | San Jose | Coyote Creek | 443 | 21% | **9.91** | **1.35** | 0.12 (n = 1) |
| 051CTC400 | San Jose | Coyote Creek | 123 | 59% | **9.27** | **0.67** | 0.49 (n = 1) |
| 066GAC150 | San Jose | Guadalupe River | 504 | 13% | 0.20 | **0.83** | NA |
| 067SCL080 | San Jose | Lower Silver Creek | 42 | 51% | 0.08 | 0.01 | **0.78** (n = 1) |
| 083CTC990 (Leo Avenue) | San Jose | Coyote Creek | 454 | 41% | **15.00** | **25.63** | NA |
| 083GAC800 | San Jose | Guadalupe River | 698 | 13% | **2.15** | **1.97** | NA |

[6] A portion of the dry and wet weather flows from this catchment are treated by the Palo Alto Regional Water Quality Control Plant via a POTW diversion structure.

With the exception of WMAs 083CTC990 (Leo Avenue) and 049SVE900 where specific source properties have been identified (SCVURPPP 2015; SCVURPPP 2016), further investigation is needed to better understand the sources and extent of PCBs in seven WMAs where elevated concentrations of PCBs and/or mercury were observed. Section 4.1 discusses planned next steps for source investigations in these WMAs.

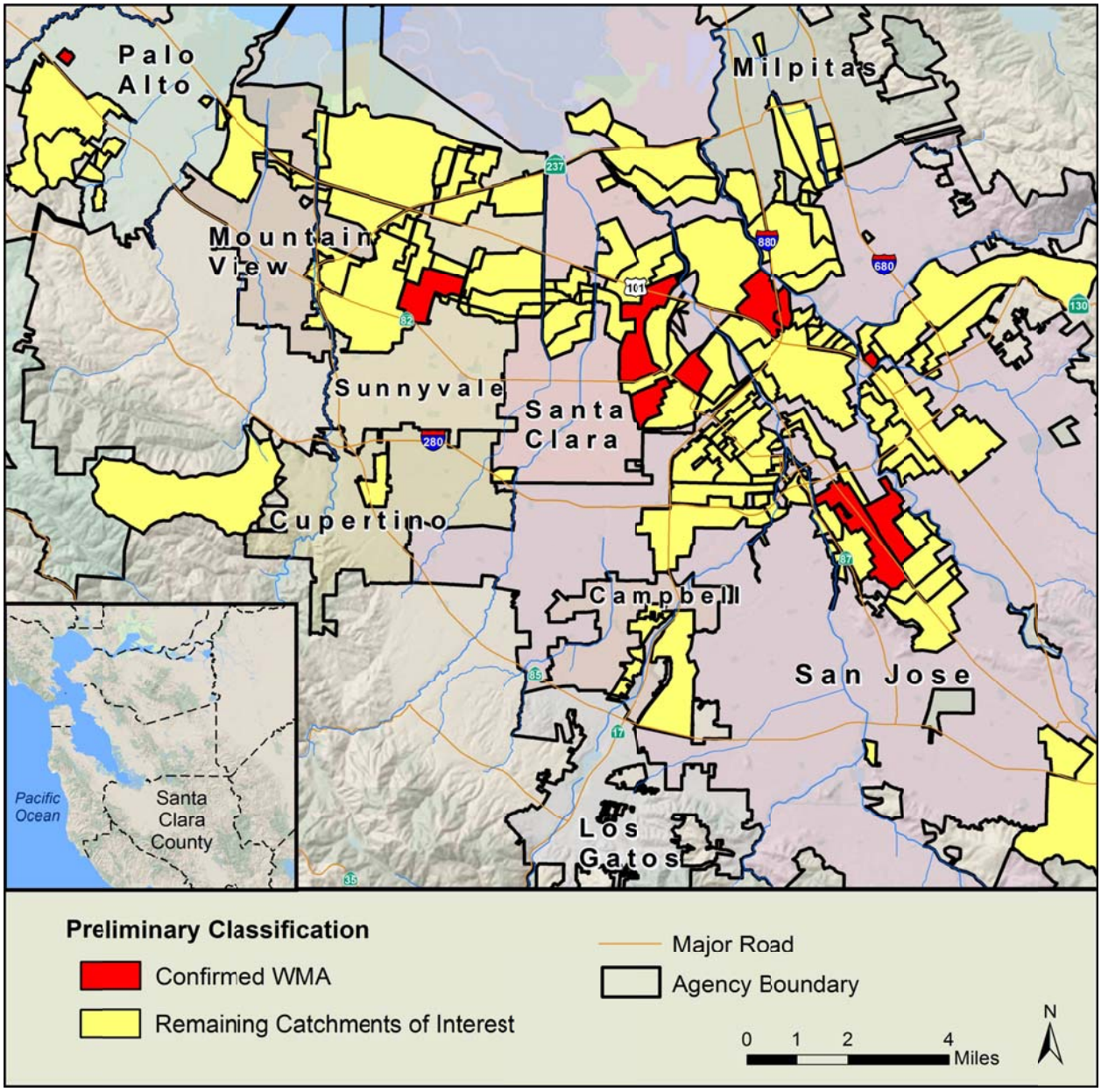



Figure 6. Santa Clara County WMAs with completed and potential storm sampling locations.

# 4.0 EXISTING AND PLANNED CONTROL MEASURES

Beginning with 2016 Annual Reports, MRP 2.0 provision C.11.a.iii(2) and C.12.a.iii(2) require Permittees to list watersheds and management areas where control measures are currently implemented or will be implemented during the term of permit. Additionally, an implementation schedule is required. The initial report (due by September 31, 2016) must include the following:

- The number, type and locations and/or frequency (if applicable) of control measures;
- The description, scope and start date of pollution prevention measures;
- For each structural control and non-structural control BMP, interim implementation progress milestones and a schedule for milestone achievement; and
- Clear statements of the roles and responsibilities of each participating Permittee for implementation of pollution prevention or control measures identified by Permittees.

Permittees are also required in subsequent annual reports to provide updates to the initial information presented with their 2016 Annual Reports.

Permittees are required to demonstrate achievement of PCB and mercury load reductions during the term of the Permit. Permittees are currently participating in a BASMAA regional project to update the reasonable and technically sound load reduction accounting system outlined in the MRP 2.0 Factsheet and described in the Integrated Monitoring Report – Part B (BASMAA 2014). This accounting system will require the identification and geographical tracking of control measure implementation over time. Summaries of tasks currently underway by SCVURPPP to improve control measure tracking and brief descriptions of the types of PCB and mercury control measures currently being implemented or being considered for implementation are described in the following sections. Additional details on existing and planned control measures will be included in the 2016 Annual Report.

## 4.1. PCB and Mercury Control Measures

As described in the Integrated Monitoring Report – Part B (BASMAA 2014) and Part C (SCVURPPP 2014), controls for PCBs and mercury generally fall into the following three categories:

- **True Source Controls (Load Avoidance)** – Controls that focus on the original source or use of a potential pollutant, True Source Controls include regulations and laws adopted to minimize or eliminate the use of a pollutant for specific activities and pollution prevention activities, such as inspections, that identify high risk practices that could generate PCBs or mercury into the environment. The one true source control for mercury is the reduction of mercury in devices and equipment as a result of legislation or voluntary reduction by manufacturers. No additional true source controls are currently available for PCBs due to the banning additional production of these organic compounds in the 1970s, and the tight regulation of PCBs currently still in use.

- **Source Controls (Load Reduction)** – Source Controls are load reduction control measures that reduce the risk of the pollutant entering the environment after it has already been used in devices/materials/equipment, or intercept the pollutant before it is discharged to a receiving water body. The control measure types that fall into this category include: the source property abatement, enhanced street sweeping, MS4 and flood control operation and maintenance, and control of PCBs containing material during building demolition.

- **Treatment Controls (Load Reduction)** – Treatment controls are load reduction control measures that remove pollutants via physical, biological, or chemical processes. The control measure types that fall into this category include stormwater treatment measures, green infrastructure (GI) and diversions of stormwater to Publicly Owned Treatment Works.

Control measures needed to address PCBs and mercury load reduction criteria included in MRP 2.0 are currently under evaluation/development by Permittees. To the extent identified to-date, control measures planned for implementation within confirmed WMAs and those planned for implementation outside of these WMAs, but have some degree of load reduction benefit, will be summarized in 2016 Annual Reports consistent with MRP requirements.

## 4.2. Tracking Control Measure Implementation

Permittees have implemented a variety of control measures since the adoption of the PCB and Mercury TMDLs. Because these actions vary both in space and time, the geographical extent and implementation level of these control measures have been challenging to track in the past. Efforts are currently underway to develop a more refined PCB and mercury control measure tracking system (PCB and Mercury Tracking System) which will improve the overall management of information necessary to track load reductions associated with these controls. Load reduction accounting during MRP 2.0 will be consistent with the accounting system described in the MRP 2.0 Factsheet and currently being refined via a BASMAA regional project.

The following provides a brief summary of the tracking methods that are currently under development by SCVURPPP on behalf of Permittees:

- **Source Property Referrals and Abatement** – As source properties are identified and referred to the Regional Water Board, information regarding pollutant concentrations observed, evidence of transport to the MS4, property ownership, previous stormwater violations, and other pertinent information is entered into the PCB and Mercury Tracking System. Additionally, the location and geographical extent of the referred property is delineated in GIS to facilitate the calculation of PCB and mercury load reductions. The Permittee must implement and track at least one BMP associated with reducing PCBs and mercury from the referred property.
- **Enhanced Operation and Maintenance**
    - **Enhanced Street Sweeping** – All Permittees conduct street sweeping and have documented the amount of material removed via their street sweeping activities since the early 2000's. Additionally, sweeping frequencies and the level of parking enforcement (or equivalent actions) that Permittees conduct were documented in the Program's GIS geodatabase in 2009 as part of trash/litter management strategy development. Should street sweeping be significantly enhanced by a Permittee, the enhanced levels will be documented by the Program and incorporated into the PCB and Mercury Tracking System.
    - **Enhanced MS4 and Flood Control O&M** – PCB and mercury reductions associated with enhanced maintenance and operation of MS4s and flood control facilities are calculated based on the increased mass of pollutants removed in a given year, compared to baseline (circa 2002). During the permit term, the Program intends to expand its tracking of pollutants removed via these controls by working with Permittees via the Program's Municipal Operations Ad Hoc Task Group to identify

and enhance data availability. As enhanced data become available, the Program's PCB and Mercury Tracking System will be updated to accommodate these data.

- **Management of PCBs in Building Materials and Infrastructure** – The Program is currently in the process of identifying all buildings in the Santa Clara Basin that would potentially be subject to MRP 2.0 permit requirements for managing PCBs during building demolition. The location of the parcels that contain these buildings will allow Permittees to identify and track building demolition over time. Parcel locations will be included in the PCB and Mercury Tracking System to allow for tracking of demolition activities and redevelopment associated with these buildings over time.
- **Green Infrastructure and Treatment Measures** – If properly maintained and functioning, green infrastructure (GI) installations are predicted to have a significant impact on stormwater quality over time in the Santa Clara Basin. Therefore, the tracking of existing and future GI facilities is an important task for demonstrating pollutant load reductions. SCVURPPP is currently in the process of documenting all GI facilities constructed as a result of new and redevelopment requirements over the past decade. Information on facilities currently in place is currently tracked by individual Permittees, but the utility of having information in a single countywide data management system will assist in calculating pollutant load reductions in the future. Key information on each facility will be tracked in a geodatabase (e.g., LID Tracker) and linked to the Program's PCB and Mercury Tracking System.
- **Diversion to Wastewater Treatment Facilities** – Currently, one structure is present in the Santa Clara Basin that diverts dry and wet weather flows from the stormwater conveyance system to a Publically Owned Treatment Plant. The structure is located in the City of Palo Alto and was evaluated as part of MRP 1.0. In the future, Permittees may choose to divert additional flows to POTWs. Pollutant load reductions from these control measures will be tracked through the Program's PCB and Mercury Tracking System.
- **Source Controls and Other Actions**
    - **Mercury Device Reduction and Recycling** - The number and type of mercury-containing devices (e.g., thermometers, switches, and fluorescent lamps) that end their lifespan and are recycled, and the levels of mercury within these devices are now tracked by SCVURPPP via a number of data sources, including local household hazardous waste programs, national mercury recycling programs, and the State of California's Waste Management Program – CalRecycle. Data from these sources are retrieved, entered into the Program's PCB and Mercury Tracking System, and utilized to calculate mercury loads avoided as a result of the control programs.
    - **Referral of Non-jurisdictional Source Properties** – Properties outside of the jurisdiction of Permittees, including electrical utilities and NPDES permitted facilities may be identified as high interest parcels and referred to the Regional Water Board for further action. As properties are referred, information on each will be entered into the Program's PCB and Mercury Tracking System and utilized to calculate PCB and mercury load reductions consistent with the regional load reduction accounting systems currently under refinement by BASMAA.
    - **Other Controls** - Should other control measure that have pollutant load reduction benefit be implemented by Permittees, the Program will evaluate and implement the most efficient tracking procedures to allow for load reduction calculations.

# 5.0 PLANNED NEAR-TERM NEXT STEPS

Prior to the September 2016 submittal listing watersheds and management areas where control measures are currently implemented or will be implemented during the term of permit, Permittees and SCVURPPP plan to continue identifying WMAs that will be the focus of PCBs and mercury control measure implementation over the course of MRP 2.0. Additionally, control measure tracking mechanisms will be developed or enhanced as described in the previous section. The selection of WMAs and appropriate control measures will be an on-going and evolving process during MRP 2.0 based on additional information that becomes available and opportunities identified for cost-effective implementation of actions. Specific near-term next steps currently planned include:

- Continue to collect and evaluate information to identify additional WMAs using the framework developed by BASMAA member agencies and expanded upon by SCVURPPP, including the collection of stormwater monitoring data from many of the remaining 130 catchments of interest;
- Follow-up with the Regional Water Board on the status of the referral of the railroad property on Leo Avenue (San Jose) and assist in next steps as appropriate;
- Begin source identification studies in a subset of the seven WMAs listed in Table 5, including the review of records associated with High Interest properties in the WMA, performing reconnaissance surveys, conducting facility inspections in cooperation with Permittee staff, and collecting additional sediment samples and/or stormwater samples to further characterize PCB concentrations and identify source properties;
- Refine the PCB and mercury load reduction accounting methodology via a BASMAA regional project, and submit to the Regional Water Board with the 2016 Annual Report;
- Review existing modeling approaches to demonstrating reasonable assurance that load reductions required by the PCB and mercury TMDLs are achieved, and develop a work plan for preparation of a Reasonable Assurance Analysis (RAA) that demonstrates how GI and other control measures will be implemented to achieve load reductions in subsequent permit terms;
- Through a BASMAA regional project, develop a sampling and analysis plan that will outline the overall design and resources necessary to evaluate the magnitude and extent of PCBs in caulks/sealants used in storm drains or roadway infrastructure;
- Through a BASMAA regional project, develop a scoping plan for the development of a method for managing PCBs during the demolition of applicable buildings, and via SCVURPPP develop a process for identifying buildings in the Santa Clara Basin that are applicable to PCBs; and
- In coordination with BASMAA and through the implementation of the CW4CB project, continue to participate in a regional effort to educate the public regarding potential human health risks from PCBs and mercury in Bay fish, and implement the Program's work plan for outreach to residents likely to consume locally-caught fish, including working with the Alviso Education Center to utilize various education and outreach products.

# 6.0 REFERENCES


City of San Jose and EOA, Inc., (2003). Year Two Case Study Investigating Elevated Levels of PCBs in Storm Drain Sediments in San Jose, California. July 2003.

City of Spokane. (2015). PCBs in Municipal Products. Ecology Municipal Stormwater Grants of Regional or Statewide Significant Grant No. G1400545. March 2015.

Geosyntec (2013). Integrated Monitoring Report Part B: PCB and Mercury Loads Avoided and Reduced via Stormwater (IMR). Prepared by Geosyntec Consultants for the Bay Area Stormwater Management Agencies Association.

Gilbreath, A., Gluchowski, D., Hunt, J., Wu, J., and McKee, L. J. (2014). Pollutants of Concern (POC) Loads Monitoring Data Progress Report, Water Years (WYs) 2012 and 2013. Contribution No. 708. San Francisco Estuary Institute, Richmond, California.

Kinnetic Laboratories, Inc and EOA, Inc. (KLI & EOA). (2002). Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs, and Organochlorine Pesticides. Prepared for: Santa Clara Valley Urban Runoff Pollution Prevention Program, Contra Costa Clean Water Program, Santa Clara Countywide Stormwater Pollution Prevention Program, Marin County Stormwater Pollution Prevention Program, Vallejo. April 2002.

Mattern & Associates, William Lettis & Associates, Inc. (WLA). (2003). Santa Clara Valley Water District Baseline Development for Hydrograph Modification Program. December 2003

McKee, L.J., Gilbreath, A.N., Hunt, J.A., and Greenfield, B.K. (2012). Pollutants of Concern (POC) Loads Monitoring Data, Water Year (WY) 2011. A technical report prepared for the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP), Small Tributaries Loading Strategy (STLS). Contribution No. 680. San Francisco Estuary Institute, Richmond, California.

McKee L.J., Gilbreath A.N., Gluchowski D., Hunt J.A., Wu J. (2013). Pollutants of Concern (POC) Loads Monitoring Data Progress Report: Water Years (WYs) 2012 and 2013. Richmond, CA: SFEI; 2014 pp. 1-84.

McKee, L.J., Gilbreath, A.N., Yee, D., and Hunt, J.A., 2016. Pollutants of concern (POC) reconnaissance monitoring draft progress report, water year (WY) 2015. A technical report prepared for the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP), Sources, Pathways and Loadings Workgroup (SPLWG), Small Tributaries Loading Strategy (STLS). Contribution No. xxx. San Francisco Estuary Institute, Richmond, California. In draft.

Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). (2015). Clean Watersheds for a Clean Bay (CW4CB) Source Property Identification and Referral Pilot Study, Leo Avenue Watershed – San Jose, California. September 2015.

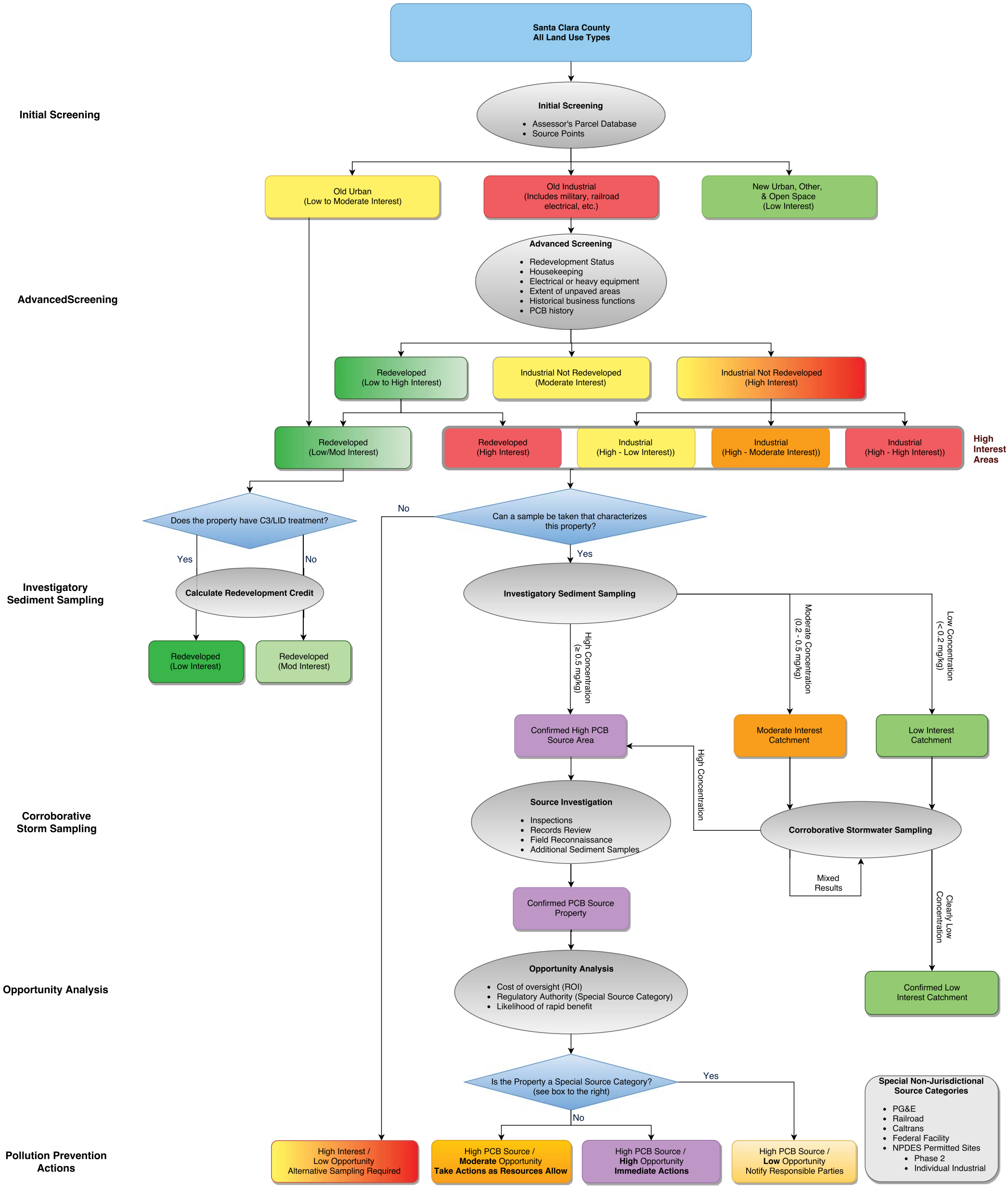
Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). (2016). DRAFT PCBs and Mercury Source Area Identification, Water Year 2015 POC Monitoring Report. In draft.

USEPA (2011). Third Five Year Review for Westinghouse Superfund Site. Sunnyvale, CA. September 2011.

Yee, D., McKee, L.J. (2010). 3.5: Concentrations of PCBs and Mercury in Soils, Sediments and Water in the Urbanized Bay Area: Implications for Best Management. A technical report of the Watershed Program. SFEI Contribution 608. San Francisco Estuary Institute, Oakland, CA. March 31, 2010.

# Appendix A

## POC Process Flow Chart


Initial Screening
AdvancedScreening
Investigatory Sediment Sampling
Corroborative Storm Sampling
Opportunity Analysis
Pollution Prevention Actions
Santa Clara County
All Land Use Types
Initial Screening
Assessor's Parcel Database
Source Points
Old Urban
(Low to Moderate Interest)
Old Industrial
(Includes military, railroad electrical, etc.)
New Urban, Other, & Open Space
(Low Interest)
Advanced Screening
Redevelopment Status
Housekeeping
Electrical or heavy equipment
Extent of unpaved areas
Historical business functions
PCB history
Redeveloped
(Low to High Interest)
Industrial Not Redeveloped
(Moderate Interest)
Industrial Not Redeveloped
(High Interest)
Redeveloped
(Low/Mod Interest)
Redeveloped
(High Interest)
Industrial
(High - Low Interest))
Industrial
(High - Moderate Interest))
Industrial
(High - High Interest))
High Interest Areas
Does the property have C3/LID treatment?
Yes
No
Calculate Redevelopment Credit
Redeveloped
(Low Interest)
Redeveloped
(Mod Interest)
No
Can a sample be taken that characterizes this property?
Yes
Investigatory Sediment Sampling
High Concentration
(≥ 0.5 mg/kg)
Moderate Concentration
(0.2 - 0.5 mg/kg)
Low Concentration
(< 0.2 mg/kg)
Confirmed High PCB Source Area
Moderate Interest Catchment
Low Interest Catchment
High Concentration
Source Investigation
Inspections
Records Review
Field Reconnaissance
Additional Sediment Samples
Corroborative Stormwater Sampling
Mixed Results
Clearly Low Concentration
Confirmed PCB Source Property
Confirmed Low Interest Catchment
Opportunity Analysis
Cost of oversight (ROI)
Regulatory Authority (Special Source Category)
Likelihood of rapid benefit
Is the Property a Special Source Category?
(see box to the right)
Yes
No
Special Non-Jurisdictional Source Categories
PG&E
Railroad
Caltrans
Federal Facility
NPDES Permitted Sites
Phase 2
Individual Industrial
High Interest /
Low Opportunity
Alternative Sampling Required
High PCB Source /
Moderate Opportunity
Take Actions as Resources Allow
High PCB Source /
High Opportunity
Immediate Actions
High PCB Source /
Low Opportunity
Notify Responsible Parties

# Appendix B

## Stormwater Catchments of Interest

| Catchment ID | Permittee | Outfall Water Body | Acres | % High Interest | % Moderate Interest | % Redeveloped Old Industrial | % New Urban | % Open Space | % Other | Confirmed Source Catchment | Sampling Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 080JSC600 | Cupertino | Junipero Serra Channel | 273 | 4.7% | 93% | 2% | 0% | 1% | 0% | | Low |
| 113LGC030 | Cupertino | Los Gatos Creek | 84 | 4.1% | 91% | 5% | 0% | 0% | 0% | | Low |
| 113LGC140 | Cupertino | Los Gatos Creek | 126 | 10% | 88% | 2% | 0% | 0% | 0% | | Low |
| 113LGC510 | Cupertino | Los Gatos Creek | 45 | 28% | 70% | 3% | 0% | 0% | 0% | | Low |
| 113LGC565 | Cupertino | Los Gatos Creek | 83 | 34% | 54% | 11% | 0% | 1% | 0% | | Low |
| 113LGC670 | Cupertino | Los Gatos Creek | 56 | 13% | 24% | 63% | 0% | 0% | 0% | | Low |
| 113LGC900 | Cupertino | Los Gatos Creek | 15 | 34% | 37% | 29% | 0% | 0% | 0% | | Low |
| 021CLA060 | Milpitas | Calera Creek | 33 | 46% | 9% | 0% | 45% | 0% | 0% | | Low |
| 021PIC060 | Milpitas | Piedmont Creek | 59 | 12% | 20% | 1% | 67% | 0% | 0% | | Low |
| 035CTC700 | Milpitas | Coyote Creek | 319 | 1.3% | 3% | 0% | 94% | 2% | 0% | | Low |
| 036BYC091 | Milpitas | Berryessa Creek | 121 | 71% | 23% | 4% | 1% | 0% | 0% | | Low |
| 036BYC320 | Milpitas | Berryessa Creek | 38 | 5.8% | 94% | 0% | 0% | 0% | 0% | | Low |
| 036PCL576 | Milpitas | Lower Penitencia Creek | 61 | 17% | 66% | 12% | 0% | 5% | 0% | | Low |
| 036PEC800 | Milpitas | Penitencia East Channel | 38 | 27% | 62% | 10% | 0% | 1% | 0% | | Low |
| 036PEC822 | Milpitas | Penitencia East Channel | 29 | 43% | 46% | 10% | 0% | 2% | 0% | | Low |
| Ford Creek | Milpitas | Wrigley-Ford Creek | 308 | 35% | 55% | 6% | 4% | 1% | 0% | | High |
| Wrigley Creek | Milpitas | Wrigley-Ford Creek | 461 | 19% | 4% | 8% | 67% | 2% | 0% | | High |
| 017xxx010 | Mountain View | San Francisco Bay | 862 | 3.0% | 80% | 8% | 7% | 2% | 0% | | High |
| 032PMC100 | Mountain View | Permanente Creek | 47 | 26% | 57% | 15% | 0% | 2% | 0% | | Low |
| 032PMC130 | Mountain View | Permanente Creek | 15 | 1.90% | 98% | 0% | 0% | 0% | 0% | | Low |
| 032PMC170 | Mountain View | Permanente Creek | 40 | 6.3% | 63% | 30% | 0% | 0% | 0% | | Low |
| 032SVC470 | Mountain View | Stevens Creek | 71 | 13% | 72% | 14% | 0% | 1% | 0% | | Low |
| 032SVC490 | Mountain View | Stevens Creek | 513 | 1.2% | 57% | 25% | 0% | 17% | 0% | | High |
| 032SVC550 | Mountain View | Stevens Creek | 36 | 5.7% | 94% | 0% | 0% | 0% | 0% | | Low |
| 047SVC150 | Mountain View | Stevens Creek | 304 | 2.0% | 87% | 11% | 0% | 0% | 0% | | Low |

| Catchment ID | Permittee | Outfall Water Body | Acres | % High Interest | % Moderate Interest | % Redeveloped Old Industrial | % New Urban | % Open Space | % Other | Confirmed Source Catchment | Sampling Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 047SVC200 | Mountain View | Stevens Creek | 26 | 8.7% | 91% | 0% | 0% | 0% | 0% | | Low |
| SVC-A[7] | Mountain View | Stevens Creek | 453 | 31% | 51% | 0% | 5% | 12% | 2% | | Low |
| 001SFC100[8] | Palo Alto | San Francisquito Creek | 36 | 0.0% | 95% | 5% | 0% | 0% | 0% | yes | NA |
| 016MTC910 | Palo Alto | Matadero Creek | 1,486 | 0.8% | 80% | 1% | 0% | 18% | 0% | | Low |
| 017ADC600 | Palo Alto | Adobe Creek | 50 | 43% | 32% | 22% | 0% | 2% | 0% | | High |
| 017BCK200 | Palo Alto | Barron Creek | 18 | 16% | 83% | 0% | 0% | 0% | 0% | | Low |
| 031MTC400 | Palo Alto | Matadero Creek | 66 | 24% | 59% | 4% | 0% | 14% | 0% | | Low |
| 031MTC410 | Palo Alto | Matadero Creek | 79 | 33% | 57% | 10% | 0% | 0% | 0% | | Low |
| 031SCH250 | Palo Alto | Stanford Channel | 68 | 53% | 30% | 16% | 0% | 1% | 0% | | Low |
| SCH-K | Palo Alto | Matadero Creek | 571 | 4.7% | 67% | 8% | 0% | 20% | 0% | | High |
| 034AVS120 | San Jose | Alviso Slough | 251 | 7.5% | 49% | 0% | 12% | 32% | 0% | | Low |
| 035GAC010 | San Jose | Guadalupe River | 936 | 0.2% | 14% | 0% | 74% | 12% | 0% | | Low |
| 035GAC015 | San Jose | Guadalupe River | 510 | 14% | 1% | 0% | 77% | 7% | 0% | | Low |
| 036PCL800 | San Jose | Penitencia Creek-Lwr | 892 | 6.9% | 86% | 3% | 0% | 4% | 0% | | Low |
| 036PCL810 | San Jose | Penitencia Creek-Lwr | 195 | 18% | 78% | 1% | 0% | 3% | 0% | | Low |
| 050CTC100 | San Jose | Coyote Creek | 106 | 22% | 41% | 10% | 25% | 2% | 0% | | Low |
| 050GAC020 | San Jose | Guadalupe River | 1,381 | 10% | 24% | 4% | 54% | 8% | 0% | | High |
| 051CTC150 | San Jose | Coyote Creek | 40 | 14% | 86% | 0% | 0% | 0% | 0% | | Low |
| 051CTC275 | San Jose | Coyote Creek | 443 | 21% | 54% | 4% | 15% | 7% | 0% | yes | NA |
| 051CTC400 | San Jose | Coyote Creek | 123 | 59% | 28% | 12% | 0% | 1% | 0% | yes | NA |
| 051CTC450 | San Jose | Coyote Creek | 244 | 11% | 75% | 0% | 0% | 15% | 0% | | High |
| 051CTC850 | San Jose | Coyote Creek | 113 | 13% | 82% | 4% | 0% | 2% | 0% | | Low |
| 051CTC950 | San Jose | Coyote Creek | 23 | 28% | 68% | 0% | 0% | 4% | 0% | | Low |

[7] The majority of High Interest area in this catchment is comprised of NASA's Ames Research Center, which is a non-jurisdictional property.
[8] A portion of the dry and wet weather flows from this catchment are treated by the Palo Alto Regional Water Quality Control Plant via a POTW diversion structure.

| Catchment ID | Permittee | Outfall Water Body | Acres | % High Interest | % Moderate Interest | % Redeveloped Old Industrial | % New Urban | % Open Space | % Other | Confirmed Source Catchment | Sampling Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 066GAC110 | San Jose | Guadalupe River | 283 | 2.2% | 57% | 7% | 29% | 5% | 0% | | Low |
| 066GAC150 | San Jose | Guadalupe River | 504 | 13% | 56% | 15% | 0% | 3% | 13% | yes | NA |
| 066GAC152 | San Jose | Guadalupe River | 390 | 14% | 1% | 8% | 0% | 1% | 76% | | High |
| 066GAC550 | San Jose | Guadalupe River | 1,494 | 10% | 85% | 4% | 0% | 1% | 0% | | Low |
| 066GAC810 | San Jose | Guadalupe River | 131 | 11% | 85% | 0% | 0% | 4% | 0% | | Low |
| 066GAC850 | San Jose | Guadalupe River | 121 | 11% | 47% | 21% | 0% | 6% | 16% | | Low |
| 067CTC030 | San Jose | Coyote Creek | 91 | 41% | 52% | 4% | 0% | 3% | 0% | | Low |
| 067CTC150 | San Jose | Coyote Creek | 41 | 64% | 34% | 0% | 0% | 2% | 0% | | Low |
| 067CTC250 | San Jose | Coyote Creek | 41 | 46% | 45% | 9% | 0% | 0% | 0% | | High |
| 067CTC350 | San Jose | Coyote Creek | 99 | 13% | 84% | 1% | 0% | 1% | 0% | | Low |
| 067CTC351 | San Jose | Coyote Creek | 34 | 40% | 55% | 5% | 0% | 0% | 0% | | Low |
| 067CTC750 | San Jose | Coyote Creek | 68 | 4.7% | 92% | 2% | 0% | 1% | 0% | | Low |
| 067CTC810 | San Jose | Coyote Creek | 208 | 3.5% | 96% | 0% | 0% | 1% | 0% | | Low |
| 067GAC010 | San Jose | Guadalupe River | 604 | 2.8% | 89% | 0% | 0% | 8% | 0% | | High |
| 067GAC075 | San Jose | Guadalupe River | 391 | 2.0% | 91% | 0% | 0% | 7% | 0% | | High |
| 067GAC150 | San Jose | Guadalupe River | 298 | 11% | 79% | 4% | 0% | 7% | 0% | | High |
| 067GAC190 | San Jose | Guadalupe River | 314 | 6.3% | 87% | 6% | 0% | 0% | 0% | | Low |
| 067SCL063 | San Jose | Lower Silver Creek | 1,407 | 1.3% | 95% | 1% | 0% | 2% | 2% | | Low |
| 067SCL080 | San Jose | Lower Silver Creek | 42 | 51% | 25% | 23% | 0% | 1% | 0% | yes | NA |
| 067SCL120 | San Jose | Lower Silver Creek | 39 | 55% | 43% | 1% | 0% | 1% | 0% | | High |
| 068SCL150 | San Jose | Lower Silver Creek | 100 | 1.6% | 97% | 0% | 0% | 1% | 0% | | Low |
| 068SCL230 | San Jose | Lower Silver Creek | 520 | 1.3% | 96% | 0% | 0% | 3% | 0% | | Low |
| 068SCL270 | San Jose | Lower Silver Creek | 25 | 2.2% | 96% | 0% | 0% | 2% | 0% | | Low |
| 083CTC350 | San Jose | Coyote Creek | 407 | 4.5% | 84% | 2% | 0% | 9% | 0% | | Low |
| 083CTC650 | San Jose | Coyote Creek | 118 | 0.2% | 85% | 3% | 0% | 12% | 0% | | Low |
| 083CTC990 | San Jose | Coyote Creek | 454 | 41% | 41% | 17% | 0% | 2% | 0% | yes | NA |
| 083GAC240 | San Jose | Guadalupe River | 271 | 11% | 72% | 16% | 0% | 1% | 0% | | High |

| Catchment ID | Permittee | Outfall Water Body | Acres | % High Interest | % Moderate Interest | % Redeveloped Old Industrial | % New Urban | % Open Space | % Other | Confirmed Source Catchment | Sampling Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 083GAC246 | San Jose | Guadalupe River | 43 | 15% | 73% | 11% | 0% | 1% | 0% | | Low |
| 083GAC300 | San Jose | Guadalupe River | 27 | 5.7% | 48% | 44% | 0% | 2% | 0% | | Low |
| 083GAC575 | San Jose | Guadalupe River | 139 | 1.5% | 97% | 0% | 0% | 1% | 0% | | Low |
| 083GAC800 | San Jose | Guadalupe River | 698 | 13% | 50% | 13% | 0% | 24% | 0% | yes | NA |
| 083GAC900 | San Jose | Guadalupe River | 133 | 14% | 78% | 5% | 0% | 4% | 0% | | Low |
| 083LGC090 | San Jose | Los Gatos Creek | 33 | 42% | 21% | 37% | 0% | 1% | 0% | | Low |
| 083LGC225 | San Jose | Los Gatos Creek | 30 | 32% | 21% | 47% | 0% | 0% | 0% | | Low |
| 083LGC686 | San Jose | Los Gatos Creek | 49 | 39% | 22% | 39% | 0% | 0% | 0% | | High |
| 084CTC625 | San Jose | Coyote Creek | 205 | 22% | 70% | 4% | 0% | 4% | 0% | | NA |
| 099GAC240 | San Jose | Guadalupe River | 298 | 22% | 62% | 12% | 0% | 4% | 0% | | High |
| 099GAC500 | San Jose | Guadalupe River | 87 | 4.7% | 88% | 1% | 0% | 6% | 0% | | Low |
| 099LGC180 | San Jose | Los Gatos Creek | 1,094 | 0.3% | 99% | 0% | 0% | 1% | 0% | | Low |
| 100CTC050 | San Jose | Coyote Creek | 48 | 3.9% | 80% | 14% | 0% | 2% | 0% | | Low |
| 100CTC190 | San Jose | Coyote Creek | 295 | 1.5% | 97% | 0% | 0% | 1% | 0% | | Low |
| 100CTC400 | San Jose | Coyote Creek | 296 | 7.9% | 75% | 5% | 0% | 12% | 0% | | High |
| 100CTC500 | San Jose | Coyote Creek | 729 | 12% | 57% | 0% | 0% | 31% | 0% | | Low |
| 113LGC010 | San Jose | Los Gatos Creek | 1,040 | 3.1% | 95% | 1% | 0% | 1% | 0% | | Low |
| 128GAC490 | San Jose | Guadalupe River | 60 | 1.3% | 88% | 5% | 1% | 5% | 0% | | Low |
| 129CNC165 | San Jose | Canoas Creek | 369 | 44% | 22% | 5% | 5% | 24% | 0% | | High |
| 130CNC022 | San Jose | Canoas Creek | 3,645 | 2.6% | 35% | 0% | 20% | 42% | 0% | | Low |
| GAC-B | San Jose | Guadalupe River | 216 | 3.4% | 69% | 0% | 0% | 27% | 0% | | Low |
| LGC-C3 | San Jose | Los Gatos Creek | 173 | 16% | 73% | 6% | 0% | 5% | 0% | | Low |
| Miguelita Creek | San Jose | Coyote Creek | 2,213 | 0.6% | 71% | 0% | 6% | 23% | 0% | | High |
| 083LGC430 | San Jose/ County | Los Gatos Creek | 59 | 6.8% | 69% | 20% | 0% | 4% | 0% | | High |
| 083LGC525 | San Jose/ County | Los Gatos Creek | 424 | 3.5% | 93% | 3% | 0% | 0% | 0% | | High |
| 035GAC150 | Santa Clara | Guadalupe River | 46 | 29% | 8% | 0% | 62% | 2% | 0% | | Low |

| Catchment ID | Permittee | Outfall Water Body | Acres | % High Interest | % Moderate Interest | % Redeveloped Old Industrial | % New Urban | % Open Space | % Other | Confirmed Source Catchment | Sampling Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 049CZC690 | Santa Clara | Calabazas Creek | 29 | 19% | 0% | 9% | 68% | 4% | 0% | | Low |
| 049CZC810 | Santa Clara | Calabazas Creek | 68 | 6.1% | 64% | 13% | 16% | 1% | 0% | | Low |
| 049STA050 | Santa Clara | San Tomas Creek | 396 | 17% | 50% | 0% | 33% | 1% | 0% | | High |
| 049STA300 | Santa Clara | San Tomas Creek | 154 | 26% | 44% | 2% | 27% | 2% | 0% | | High |
| 049STA500 | Santa Clara | San Tomas Aquino Creek | 40 | 63% | 32% | 0% | 4% | 1% | 0% | | Low |
| 049STA550 | Santa Clara | San Tomas Creek | 247 | 25% | 54% | 12% | 9% | 0% | 0% | | High |
| 049STA600 | Santa Clara | San Tomas Aquino Creek | 36 | 38% | 62% | 0% | 0% | 1% | 0% | | Low |
| 049STA710 | Santa Clara | San Tomas Creek | 296 | 20% | 76% | 4% | 0% | 0% | 0% | | High |
| 049STA800 | Santa Clara | San Tomas Aquino Creek | 246 | 5.5% | 92% | 3% | 0% | 0% | 0% | | Low |
| 050GAC030 | Santa Clara | Guadalupe River | 521 | 22% | 70% | 5% | 2% | 1% | 0% | | High |
| 050GAC190 | Santa Clara | Guadalupe River | 144 | 53% | 45% | 2% | 0% | 0% | 0% | | High |
| 050GAC400 | Santa Clara | Guadalupe River | 717 | 26% | 65% | 8% | 0% | 0% | 0% | yes | NA |
| 050GAC410 | Santa Clara | Guadalupe River | 4 | 48% | 52% | 0% | 0% | 0% | 0% | | Low |
| 050GAC580 | Santa Clara | Guadalupe River | 333 | 50% | 25% | 12% | 0% | 0% | 13% | | NA |
| 050GAC600 | Santa Clara | Guadalupe River | 689 | 4.5% | 76% | 9% | 0% | 5% | 5% | | NA |
| 081SRC530 | Santa Clara | Saratoga Creek | 81 | 61% | 39% | 0% | 0% | 0% | 0% | | Low |
| PMC-D1 | Santa Clara County | Permanente Creek | 2,537 | 1.5% | 3% | 0% | 6% | 90% | 0% | | Low |
| 033SVW950 | Sunnyvale | Sunnyvale West Channel | 92 | 5.9% | 67% | 23% | 0% | 4% | 0% | | Low |
| 033SVW955 | Sunnyvale | Sunnyvale West Channel | 259 | 10% | 80% | 7% | 0% | 2% | 0% | | Low |
| 034BFL230A | Sunnyvale | San Francisco Bay | 133 | 18% | 53% | 16% | 13% | 1% | 0% | | High |
| 034BFL230B | Sunnyvale | San Francisco Bay | 213 | 16% | 26% | 27% | 28% | 3% | 0% | | High |
| 034BFL230C | Sunnyvale | San Francisco Bay | 222 | 7.6% | 21% | 2% | 48% | 21% | 0% | | Low |
| 034CZC155 | Sunnyvale | Calabazas Creek | 486 | 16% | 78% | 1% | 5% | 0% | 0% | | High |
| 034SVE490 | Sunnyvale | Sunnyvale East Channel | 295 | 3.2% | 91% | 3% | 1% | 2% | 0% | | Low |
| 048SVE395 | Sunnyvale | Sunnyvale East | 12 | 29% | 57% | 14% | 0% | 0% | 0% | | Low |

| Catchment ID | Permittee | Outfall Water Body | Acres | % High Interest | % Moderate Interest | % Redeveloped Old Industrial | % New Urban | % Open Space | % Other | Confirmed Source Catchment | Sampling Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Channel | | | | | | | | | |
| 048SVE550 | Sunnyvale | Sunnyvale East Channel | 32 | 70% | 24% | 6% | 0% | 0% | 0% | | Low |
| 048SVW998 | Sunnyvale | Sunnyvale West Channel | 1,703 | 2.1% | 96% | 1% | 0% | 0% | 0% | | Low |
| 048SVW999 | Sunnyvale | Sunnyvale West Channel | 67 | 6.5% | 83% | 7% | 0% | 3% | 0% | | Low |
| 049CZC200 | Sunnyvale | Calabazas Creek | 710 | 23% | 44% | 17% | 14% | 2% | 0% | | High |
| 049CZC900 | Sunnyvale | Calabazas Creek | 72 | 49% | 51% | 0% | 0% | 0% | 0% | | Low |
| 049CZC910 | Sunnyvale | Calabazas Creek | 19 | 53% | 20% | 27% | 0% | 0% | 0% | | Low |
| 049ECS900 | Sunnyvale | Calabazas Creek | 89 | 33% | 67% | 0% | 0% | 0% | 0% | | Low |
| 049SVE410 | Sunnyvale | Sunnyvale East Channel | 54 | 20% | 78% | 2% | 0% | 0% | 0% | | Low |
| 049SVE720 | Sunnyvale | Sunnyvale East Channel | 126 | 5.3% | 89% | 5% | 0% | 0% | 0% | | Low |
| 049SVE900 | Sunnyvale | Sunnyvale East Channel | 480 | 17% | 82% | 0% | 0% | 1% | 0% | yes | NA |
| SVW-A | Sunnyvale | Sunnyvale West Channel | 85 | 9.2% | 33% | 2% | 0% | 56% | 0% | | Low |
| 049CZC800 | Sunnyvale/ Santa Clara | Calabazas Creek | 351 | 38% | 54% | 8% | 0% | 0% | 0% | | High |
| SVW-B[9] | Sunnyvale/Santa Clara County | Sunnyvale West Channel | 2,359 | 64% | 20% | 13% | 0% | 3% | 0% | | Low |

[9] The vast majority of land area in this catchment is comprised of non-jurisdictional properties including Moffett Federal Field, NASA's Ames Research Center. It also includes land area owned by Lockheed Martin.